

From Barriers To Bridges

*Designing Infrastructure for
Help in Online Programming
Communities*

Denae Ford Robinson
North Carolina State University

<http://denaeford.me>



What does a software engineer look like?

What does a software engineer look like?



What does a software engineer look like?



<https://movio.co/blog/day-in-the-life-movio-software-engineer/>

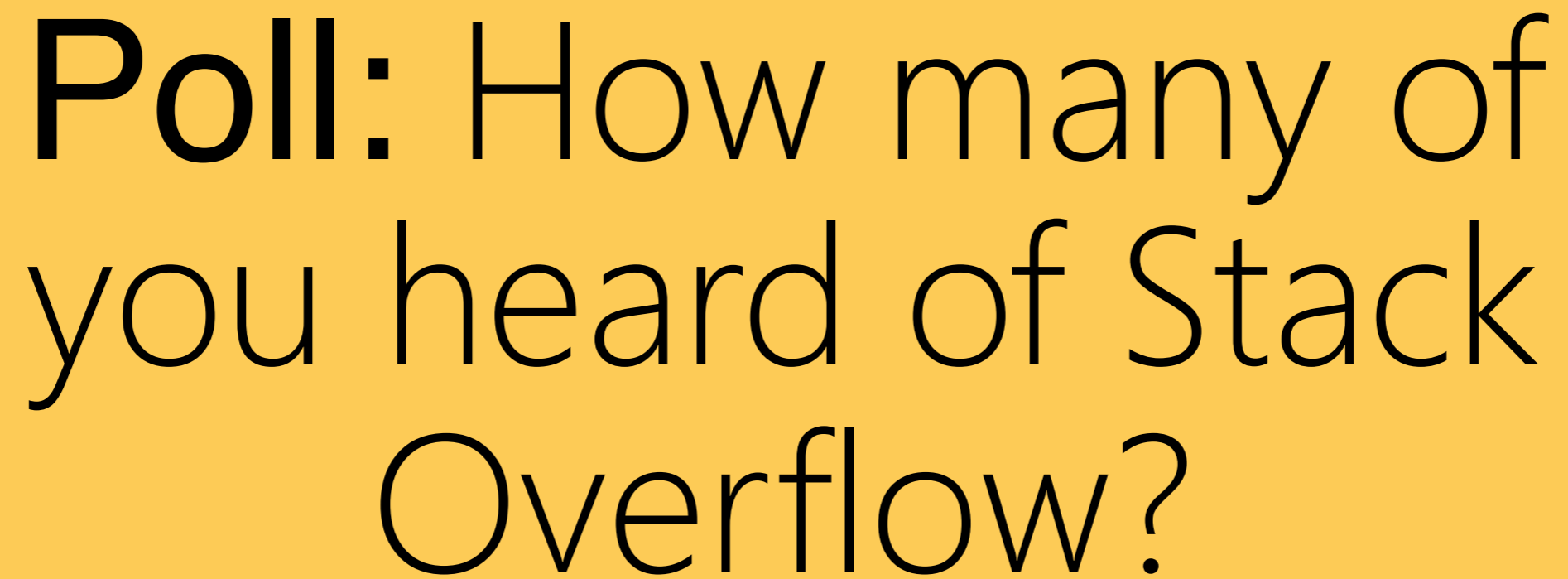


<http://wogrammer,.org>



What does a software engineer look like?





Poll: How many of
you heard of Stack
Overflow?



Degree Centralization - Star graph not evaluated as 1

[Ask Question](#)

0



I'm working with a series of undirected small graphs using igraph in R. I'm interested in graph-level degree centralization, and am using the `centr_degree` function from igraph.

However, I noticed that even in cases of "star" graphs (one node connected to all other nodes, with no other connections), the code does not return a degree centralization of 1, though it seems from Freeman 1979 that they should. Am I missing something in how this is supposed to be calculated?

[r](#) [igraph](#) [network-analysis](#)[share](#) [edit](#)

asked Aug 30 '16 at 20:57

[Abby Jones](#)

1

1 Answer



1



I think the actual problem may be an off-by-one error for the theoretical max. Calculating it manually gives you $3 * 4 = 12$, which agrees with use of `centralize(normalize=FALSE)`, but the R output from `centralization.degree` seems to be $4 * 5 = 20$. To solve your problem I'd suggest using the following code to normalize it yourself.

```
> newCentralization = function(h) centralize(degree(h),normalize=FALSE)/((vcount(h)-1)*(vcount(h)-2))
> newCentralization(h)
[1] 1

> sessionInfo()
  attached base packages:
[1] stats    graphics grDevices utils      datasets methods  base:
[1] igraph_1.0.1
```

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answered Sep 2 '16 at 5:18

[Patricia Jones](#)

26 • 2

asked 12 months ago

viewed 196 times

active 12 months ago

BLOG

[A Tale of Two Industries: How Programming Languages Differ Between Wealthy...](#)

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[active](#)[oldest](#)[votes](#)

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answered Sep 2 '16 at 5:18

[Patricia Jones](#)

26 • 2

Thanks so much Patricia! – [Abby Jones](#) Sep 7 '16 at 17:06[\[Burnett et al., 2016\]](#)

question
*1 of 17m

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Linked

answer
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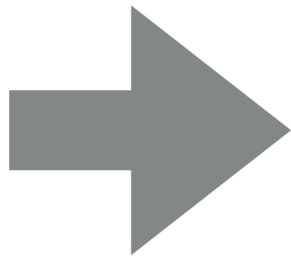
[r and igraph Help, Assortativity Coefficient with Weighted Edges. Remaining weights](#)

MOTIVATING EXAMPLE



Asha, The Programmer

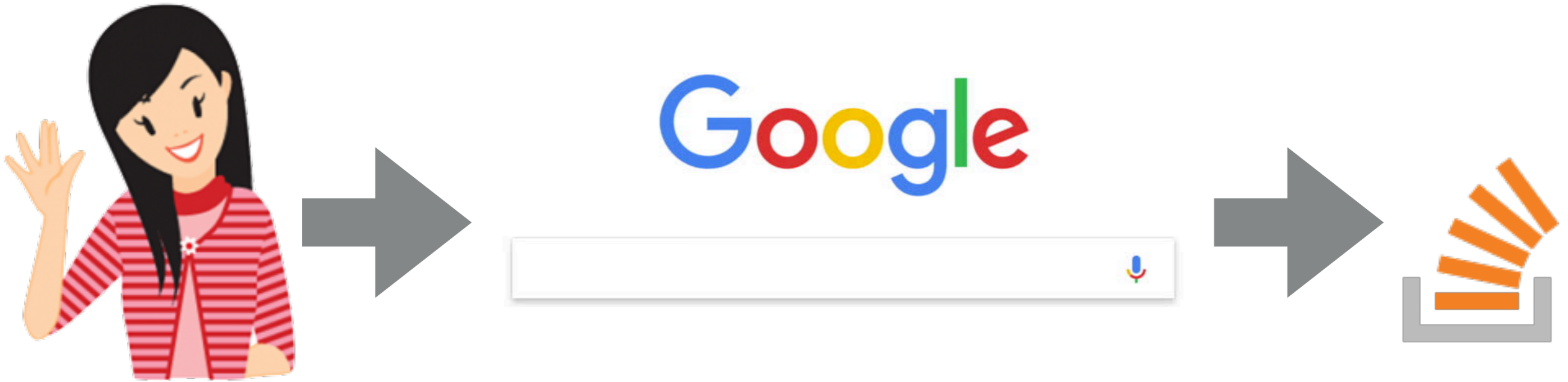
MOTIVATING EXAMPLE



Google



MOTIVATING EXAMPLE



MOTIVATING EXAMPLE



MOTIVATING EXAMPLE



1 Answer

active oldest votes

▲
7

I think the only way to import only a single type from a module is to use type alias (as you already noted). To get a qualified access to members of the module (under a different name), you can use module alias:

▼
✓

```
type Item = Item.Item // Type-alias for type(s) from module
module I = Item       // Module-alias for accessing members

// Now you can write:
let getItem() : Item = I.empty
```

I don't think there is any way for importing members from module selectively (as in Haskell), so this is probably the best option.

share edit

answered Jul 1 '10 at 10:04




Tomas Petricek

151k ● 9 ● 173 ● 335



MOTIVATING EXAMPLE















 Questions Developer Jobs Tags Users

Title

Questions that may already have your answer

- 0 [Why aren't my icons showing?](#)
- 0 [Why aren't my rectangles showing?](#) 1
- 0 [IF... Else + JOption, Why aren't my JOptionPanes showing?](#) 2
- 1 [Why Aren't My Cards Random?](#) 3
- 3 [Why aren't my divs showing up? \[closed\]](#) 2
- 0 [Why aren't my validation messages showing?](#) 1

B *I*            

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I am having a problem with getting this code to work.


```
if (x) {
  print("here is some sample code!")
};
```

Thank you.



WHAT HAPPENED?















 [Questions](#) [Developer Jobs](#) [Tags](#) [Users](#)

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- 0 [Why aren't my validation messages showing? 1](#)



B *I*            

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WHAT HAPPENED?



Questions

Developer Jobs

Tags

Users

Search...

1. did not see other users who look like her post questions



edited Jan 3 at 17:17



Md. Abu Nafee Ibna Zahid

189 ● 2 ● 11

asked Jan 3 '09 at 20:39



Alex Spurling

17.5k ● 18 ● 46 ● 58



WHAT HAPPENED?



Questions

Developer Jobs

Tags

Users

Search...

1. did not see other users who look like her post questions
2. unfamiliar with community expectations and feels her question is unfit



protected by [Aniket Thakur](#) Oct 2 '15 at 18:54

This question is protected to prevent "thanks!", "me too!", or spam answers by new users. To answer it, you must have earned at least 10 [reputation](#) on this site (the [association bonus](#) does not count).



Questions Developer Jobs Tags Users Search...

Title Why aren't my arrays showing updates?

Questions that may already have your answer

- 0 Why aren't my icons showing?
- 0 Why aren't my rectangles showing? 1
- 0 IF... Else + JOption, Why aren't my JOptionPanels showing? 2
- 1 Why Aren't My Cards Random? 3
- 3 Why aren't my divs showing up? [closed] 2
- 0 Why aren't my validation messages showing? 1



3. question may be a duplicate since list of existing questions appear



Questions

Developer Jobs

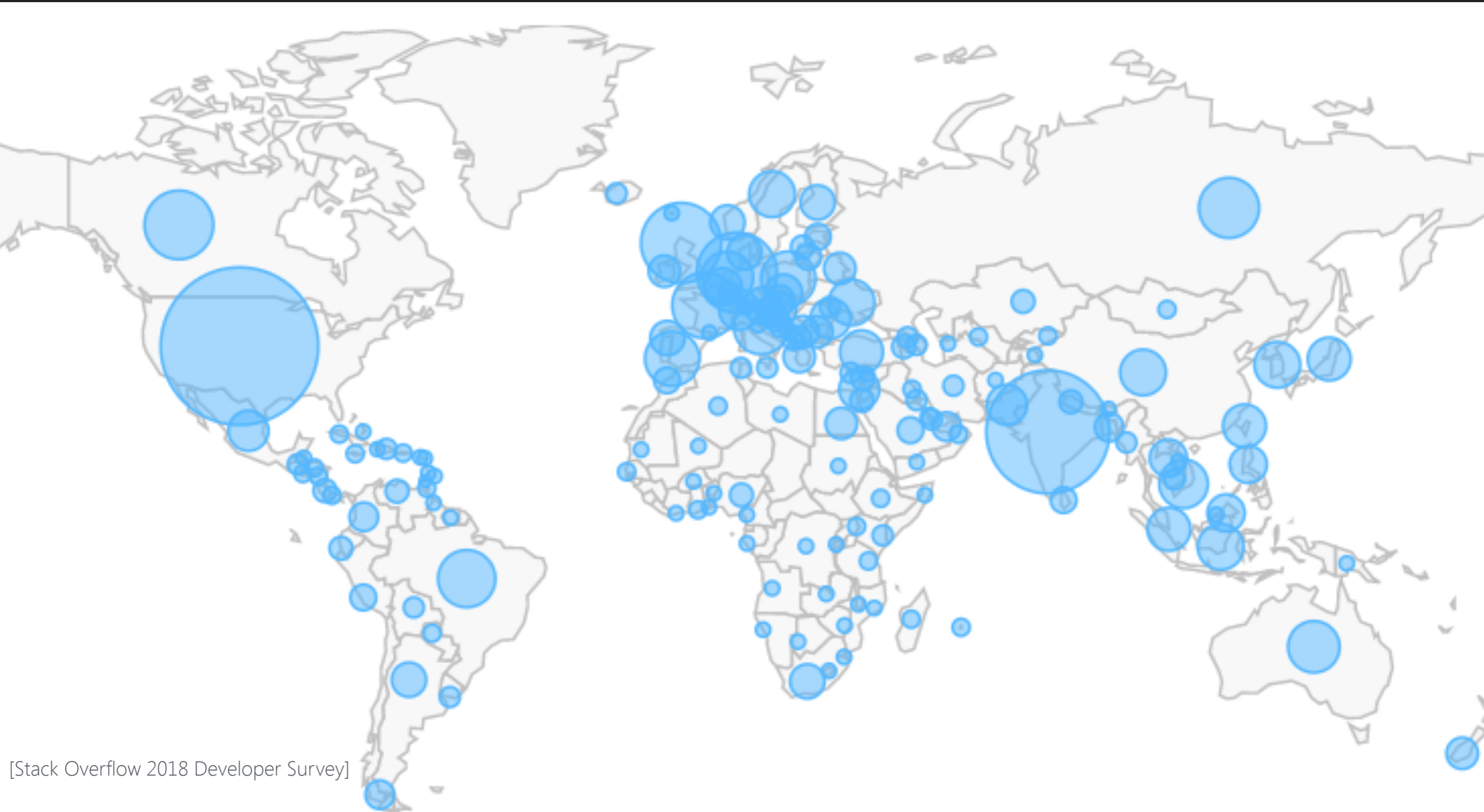
Tags

Users

Search...

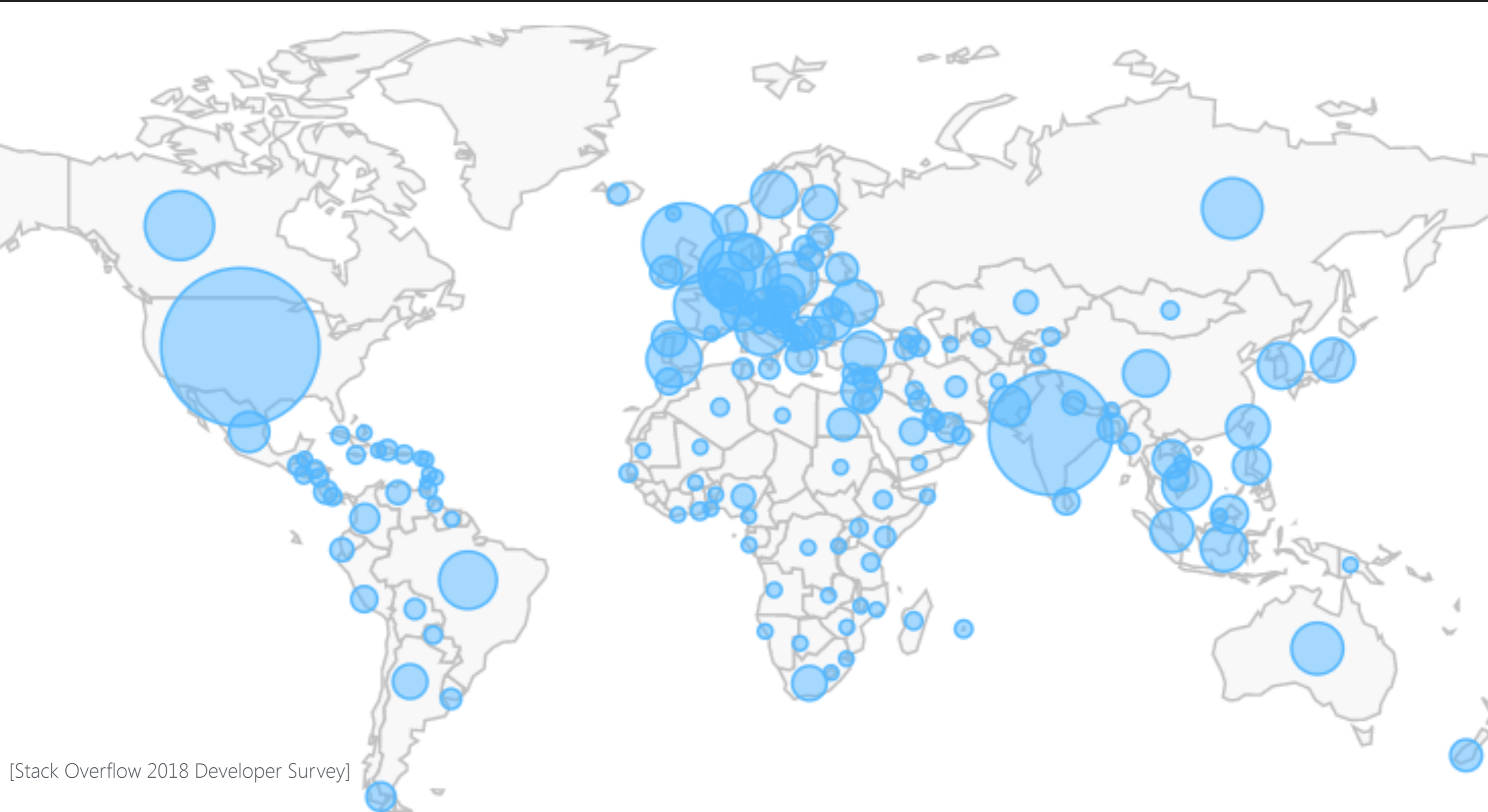
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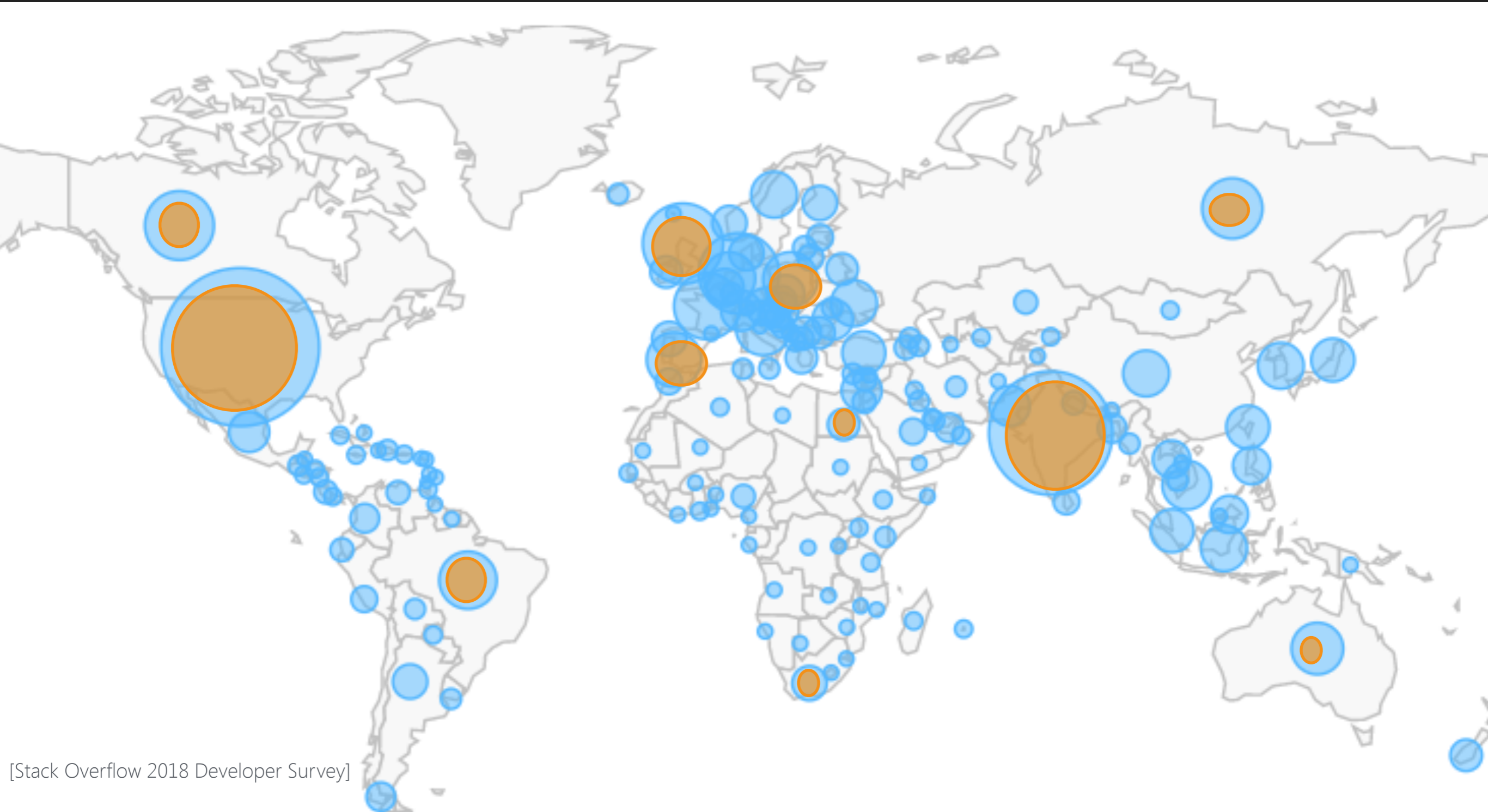
[Stack Overflow 2018 Developer Survey]

WHILE 50 MILLION PEOPLE VISIT STACK OVERFLOW MONTHLY



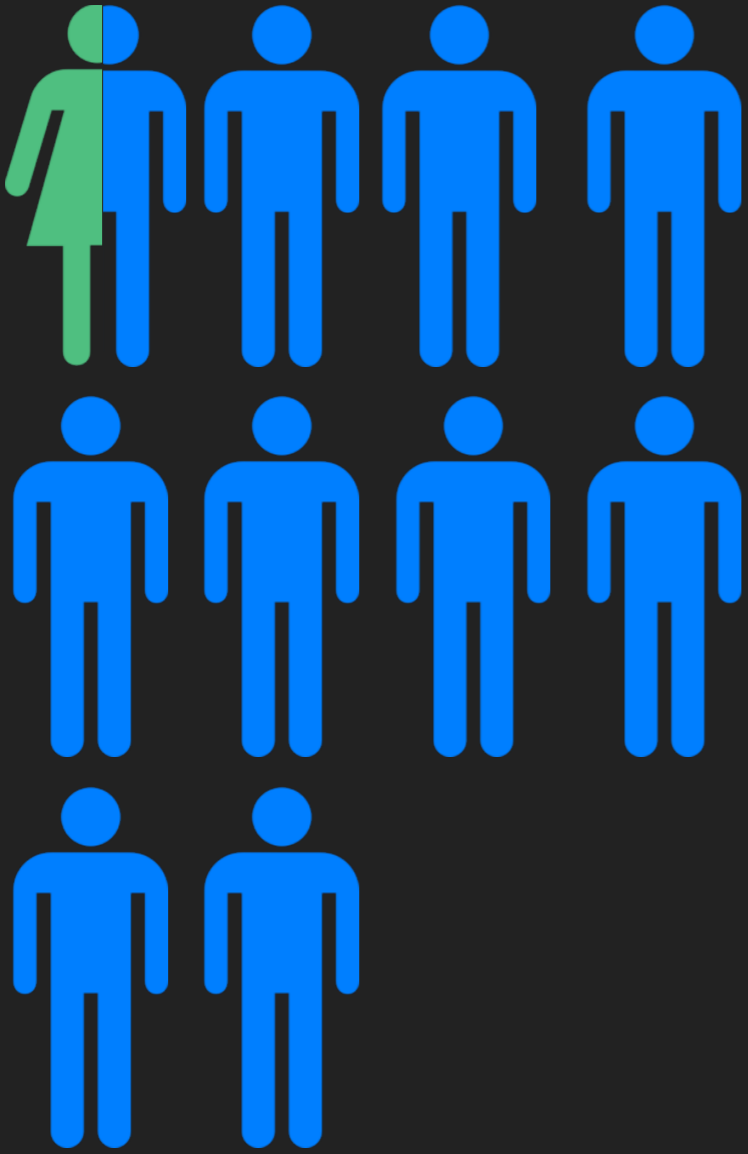
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WHILE 50 MILLION PEOPLE VISIT STACK OVERFLOW MONTHLY ONLY **10 MILLION** HAVE ACCOUNTS



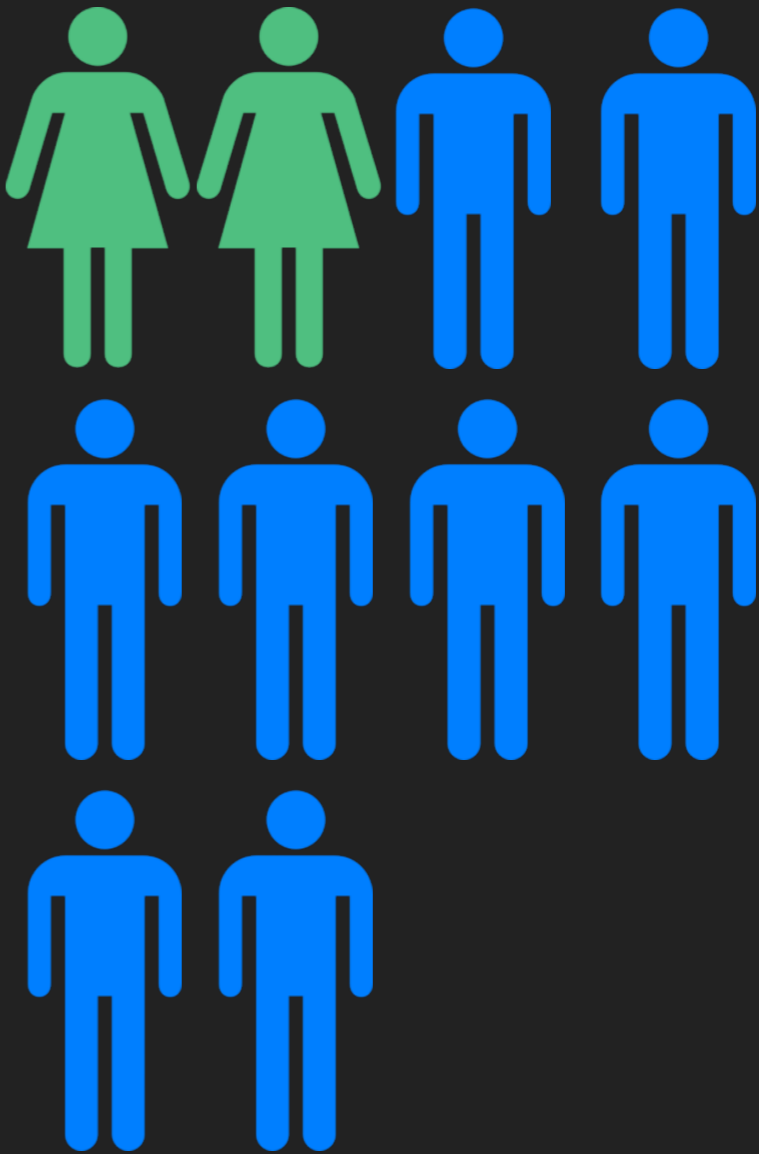
LESS THAN 7% WOMEN IN OPEN SOURCE

Open Source Communities



7% vs. 20%

Software Engineers

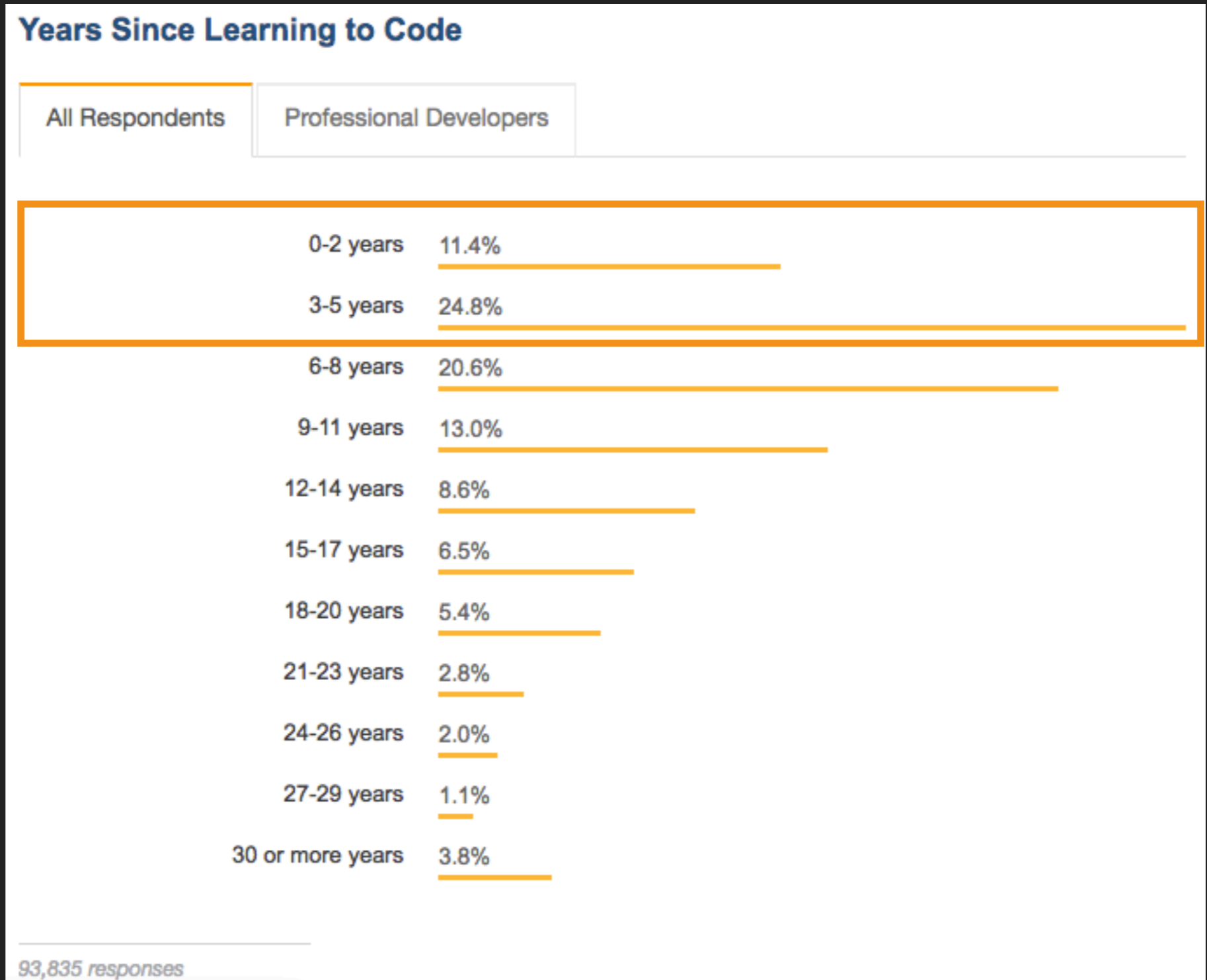


[David 2008] [Zlotnick 2017]
[SO Developer Survey 2018]

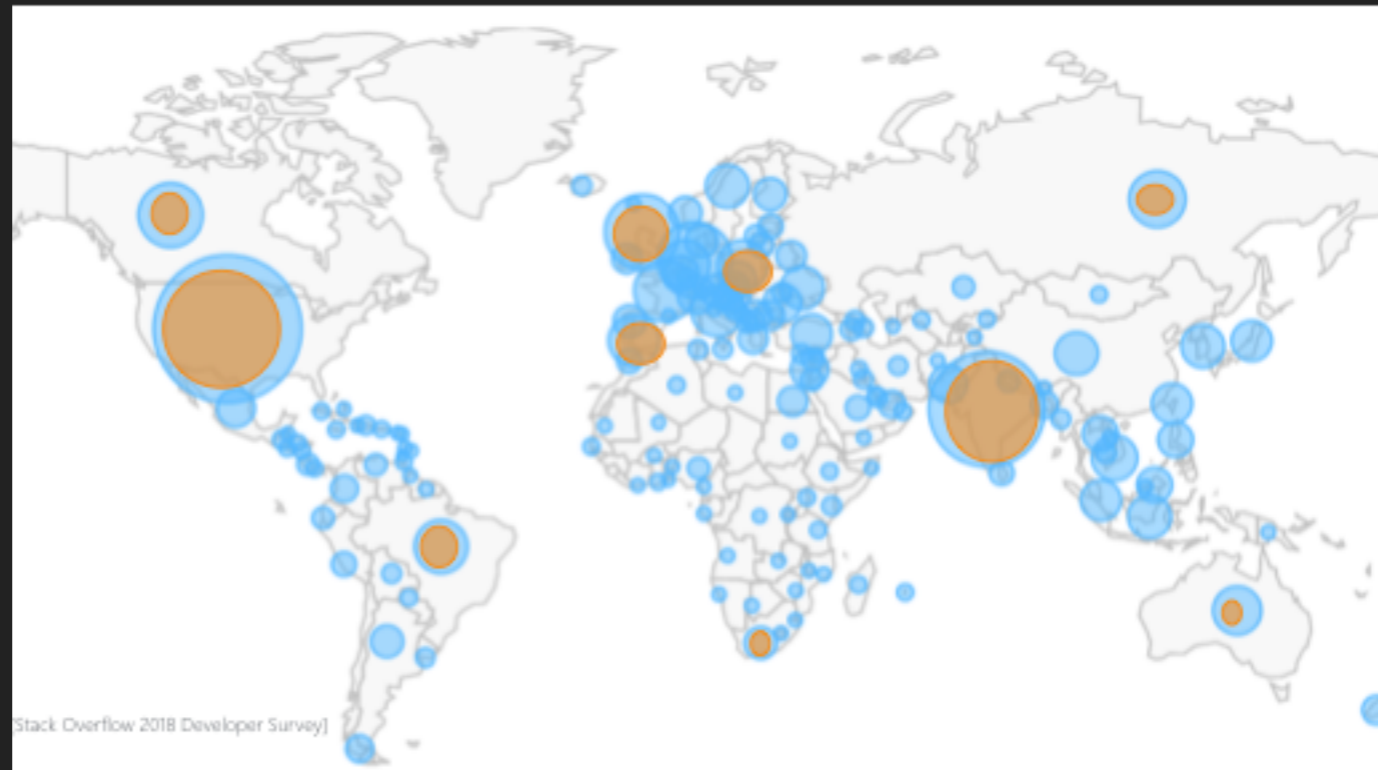
[USBLS 2016]

1/3 OF USERS HAVE ≤ 5 YEARS EXPERIENCE¹¹

Many users are new



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LESS THAN 7% WOMEN IN OPEN SOURCE

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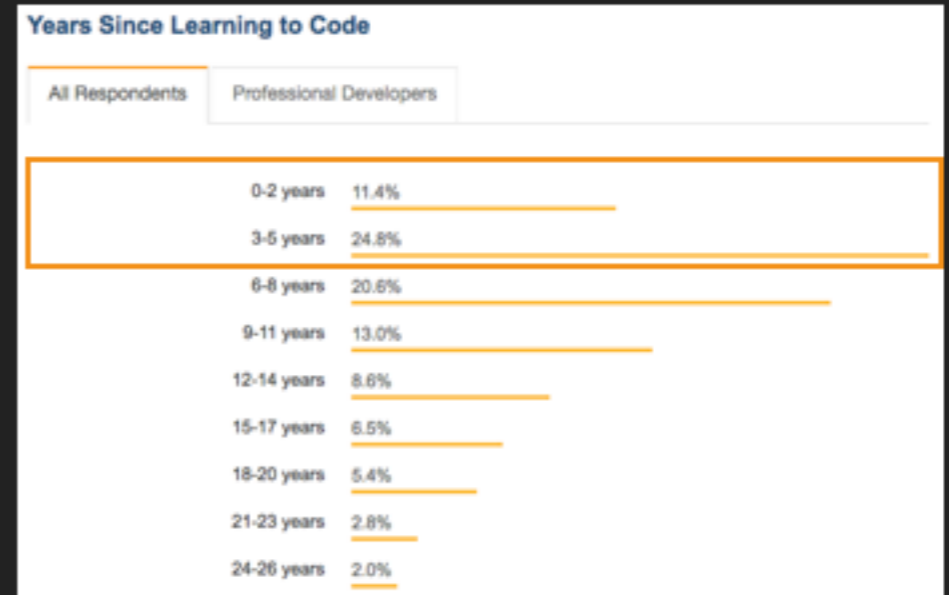
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WHILE 50 MILLION PEOPLE VISIT STACK OVERFLOW MONTHLY
ONLY **10 MILLION** HAVE ACCOUNTS



\$50+ /hour:

owns popular OSS products
Stack Overflow score > **5K**

\$100+ /hour:

owns popular OSS products
Stack Overflow score > **20K**

[Bugayenko, 2014]

LESS THAN 7% WOMEN IN OPEN SOURCE

Open Source Communities



7% vs. 20%

Software Engineers



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PROBLEM

Programmers, *especially underrepresented groups and novices*, encounter challenges when interested in participating in online programming communities.

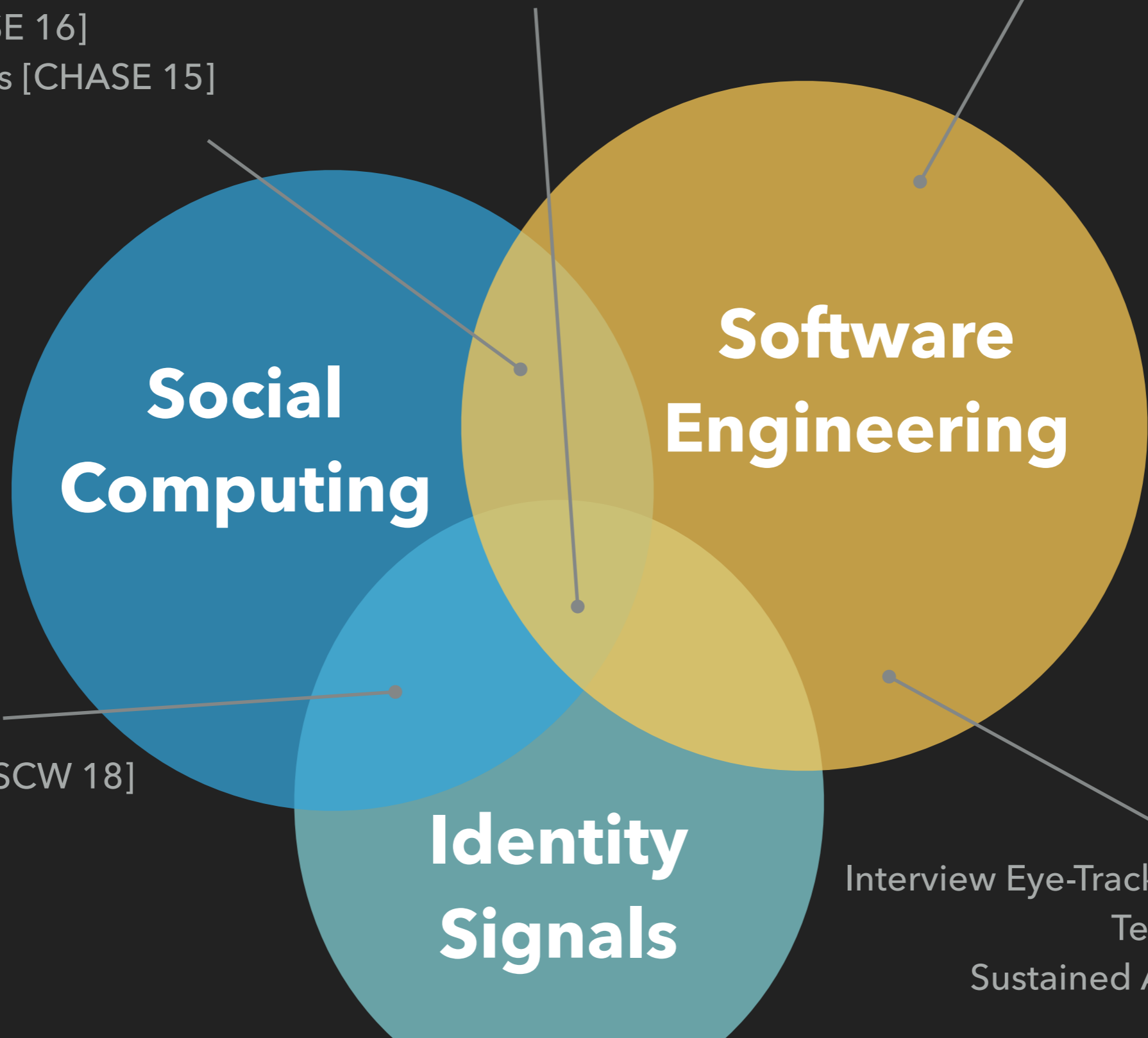


[Vasilescu 2013, Steinmacher 2015, Filippova 2015, Stack Overflow 2017]

SO Mentorship [CHI 18]
SO Compiler Errors [FSE 18]
SO Barriers [FSE 16]
Frustrated Devs [CHASE 15]

GH Signals [ICSE SEIS 19]
Peer Parity [VLHCC 17]

Characterizing Devs [ESEM 17]
Tool Notifications [FSE 16]



Social Computing

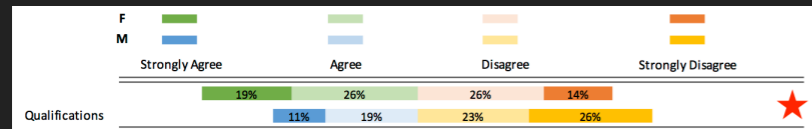
Software Engineering

Identity Signals

Identity Movements [CSCW 18]

Interview Eye-Tracking [ICSE NIER 18]
Tech Talk [CHASE 17]
Sustained Attention [EMIP 15]

TODAY



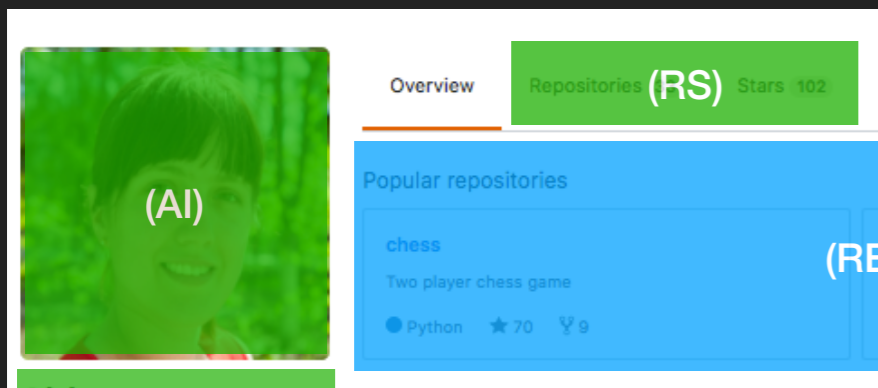
Barriers to Participation

[Ford, Smith, Guo, Parnin. FSE 2016]



Mentorship

[Ford, Lustig, Banks, Parnin. CHI 2018]



Vision

The Future of Asking

RQ1

What barriers do women face on Stack Overflow?

RQ2

How do barriers vary by gender?

RQ3

How do barriers manifest across usage and experience?

MIXED METHODS

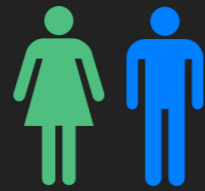
RQ1



Interviews



RQ2



Surveys

SEMI-STRUCTURED INTERVIEWS



Emailed 'Women in Computer Science' Lists

22 Responses

SEMI-STRUCTURED INTERVIEWS



Emailed 'Women in Computer Science' Lists

22 Responses

1 of 22 in "SO Top 100 of All Time"*

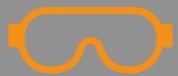
Demographics



Students



Professionals



Lurkers



Active Users

*<http://stackexchange.com/leagues/1/alltime/stackoverflow>

SEMI-STRUCTURED INTERVIEWS



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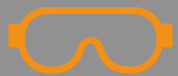
Demographics



Students



Professionals



Lurkers



Active Users

Interview Topics

Personal usage of the site

How people communicate on the site

Personal incentives to using the site

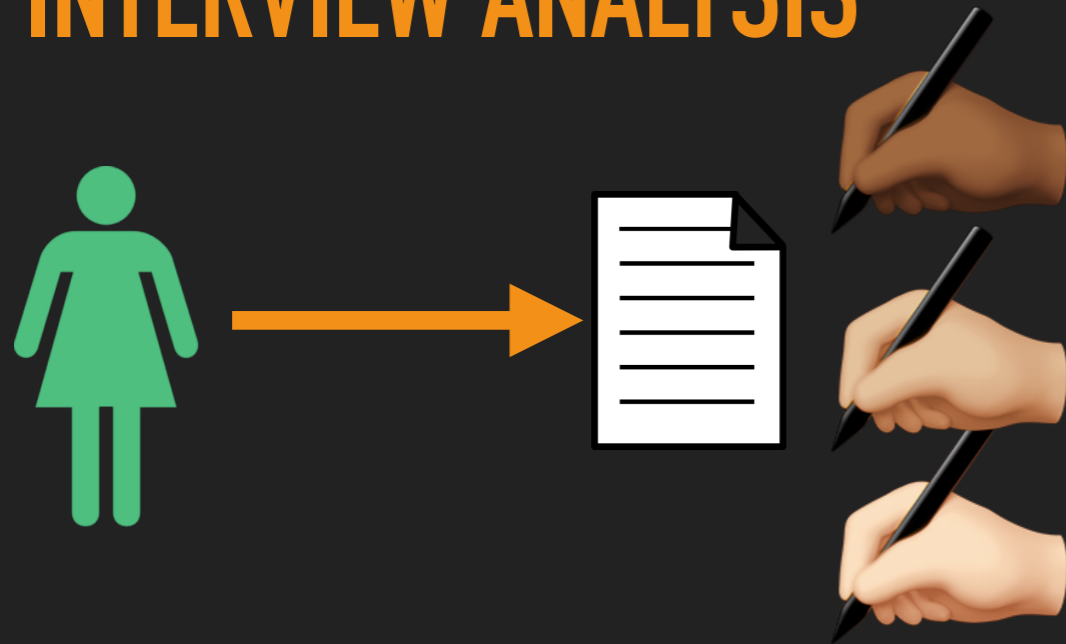
Response to potential scenarios on the site

*<http://stackexchange.com/leagues/1/alltime/stackoverflow>

INTERVIEW ANALYSIS



INTERVIEW ANALYSIS



Barrier Statement Examples

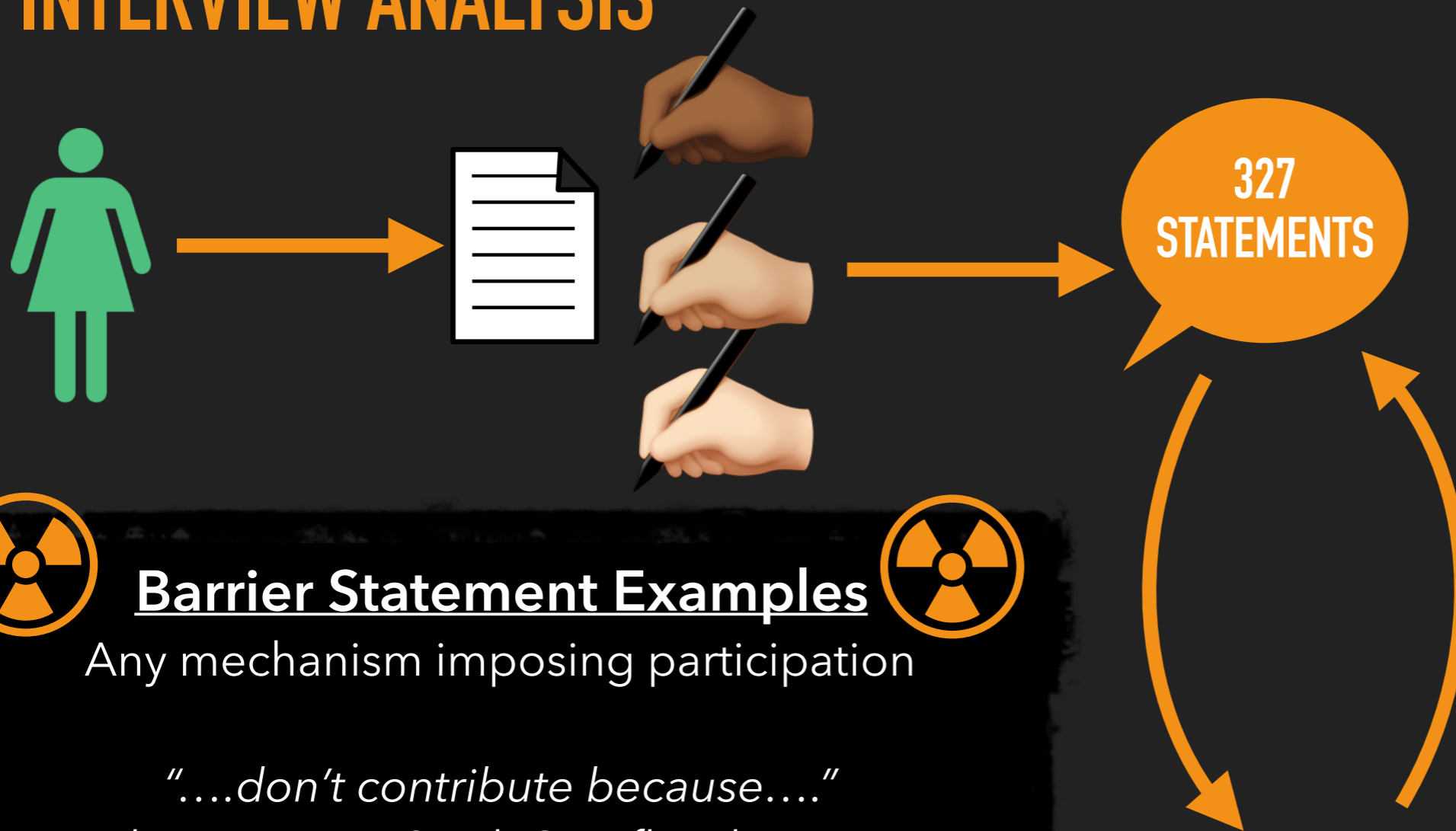


Any mechanism imposing participation

"...don't contribute because..."

"... don't post on Stack Overflow because..."

INTERVIEW ANALYSIS



Barrier Statement Examples



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P: I'm only looking for stuff that I really don't understand myself. I don't feel like my expertise ... for me to actually post an answer that would be of any help to anyone else.
[else.3:07](#)

Justin

#B.8 Doesn't feel like an expert or qualified to help others.

Denae

#B.8 Doesn't feel like her expertise is high enough to help others.

INTERVIEW ANALYSIS



Barrier Statement Examples

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“I don't feel like my expertise [is enough] for me to actually post an answer that would be of any help to anyone else.”



QUALIFICATIONS

“I don't feel like my expertise [enough] for me to actually post [advice] that would be of any help to anyone else.”

IMPOSTER SYNDROME



ONBOARDING HOOPS

*“I feel like **everyone else already knows what it is.** And [I] want to stay away from that extra work to figure out how to use it. **Just figuring out what the etiquette is,** all the little social things too that are kind of unspoken”*



ONBOARDING HOOPS

“I feel like **everyone else already knows what it is**. And [I] want to save myself from that extra work to figure out how to use it. **Just figuring out the etiquette is, all the little things too that are kind of**...”

UNFAMILIAR NORMS



FEAR OF NEGATIVE FEEDBACK

“It’s hard enough to ask for help, then to ask for help and get rude help. You are kind of like, ‘never mind’.”



FEAR OF NEGATIVE FEEDBACK

“It’s hard enough to ask for help and get rudeness when to ask for help and get rudeness when you are kind of like, ‘never’”

CONFLICT AVOIDANCE

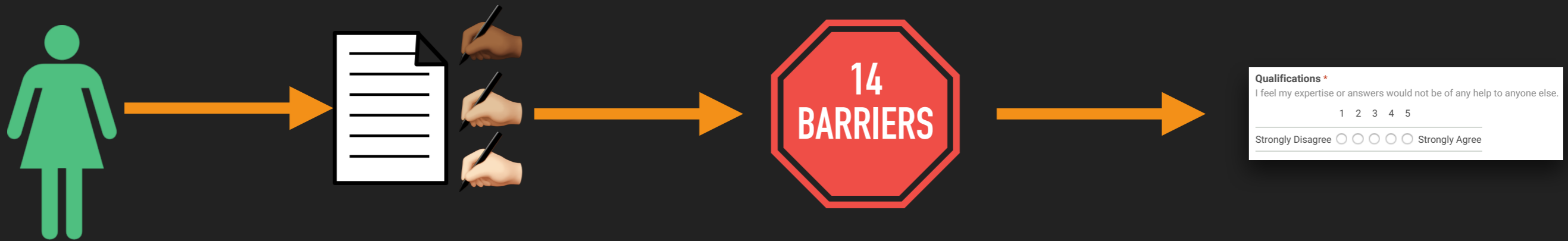


RQ1

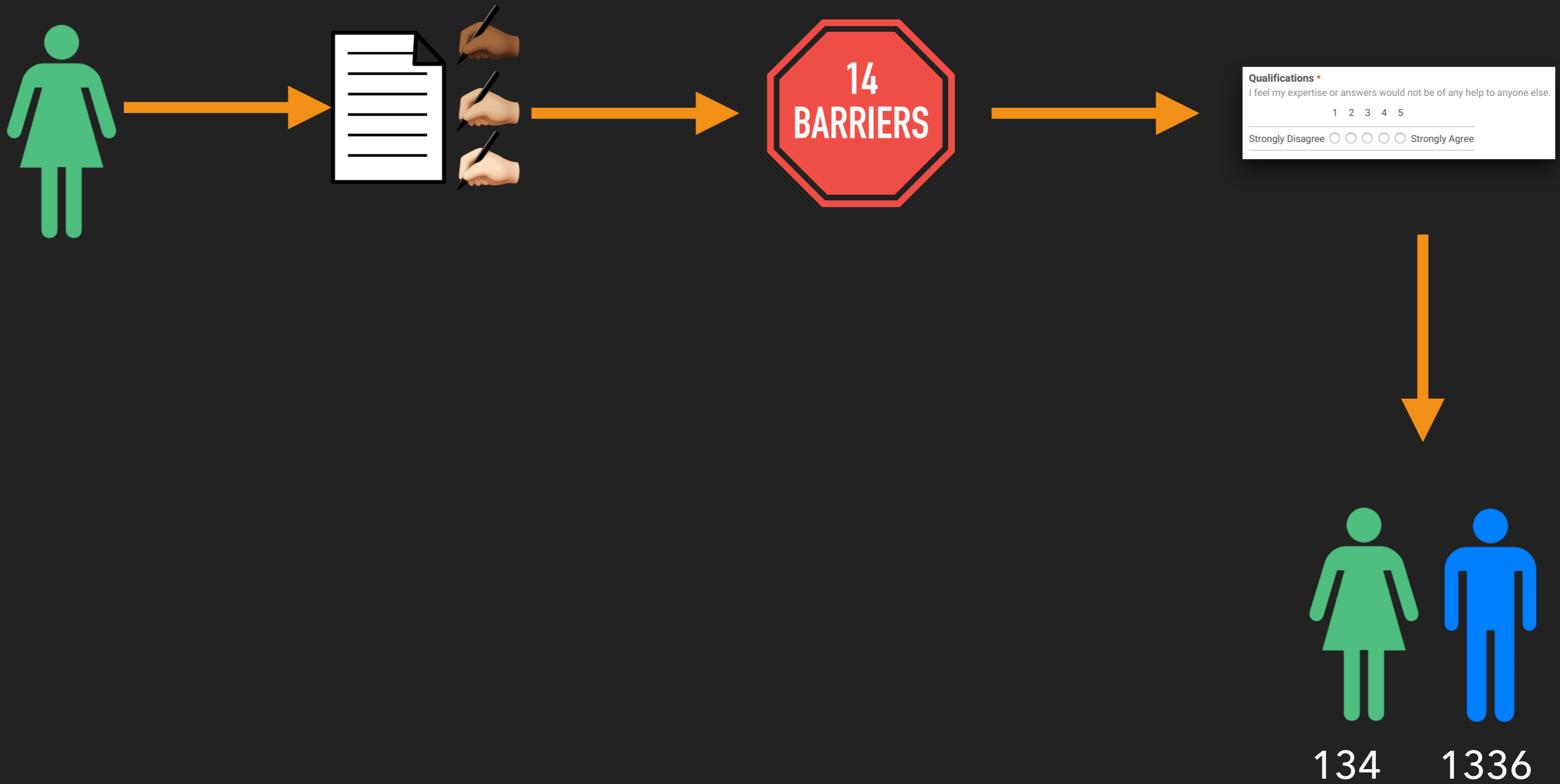
What barriers do women face on Stack Overflow?

RQ2

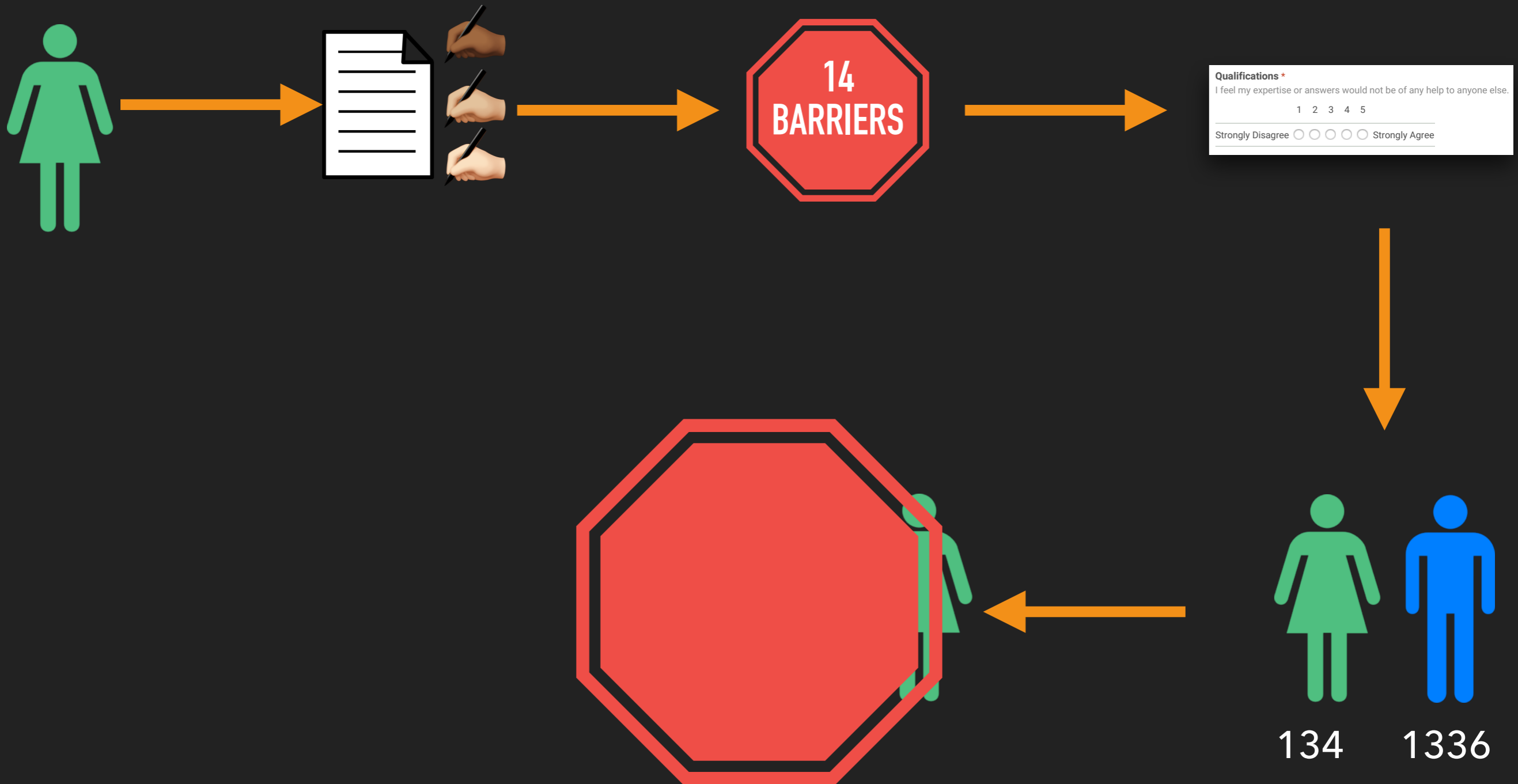
How do barriers vary by gender?

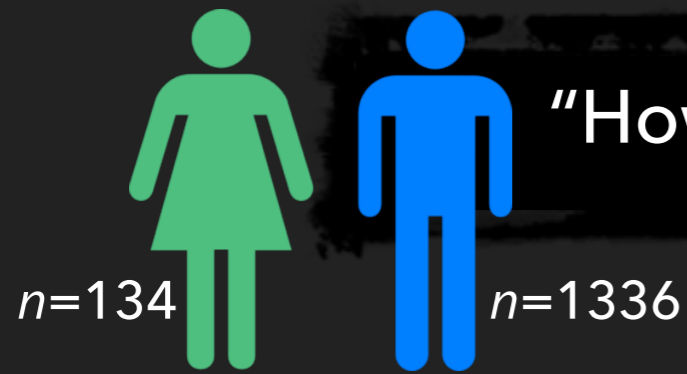


EXPERIMENT



EXPERIMENT



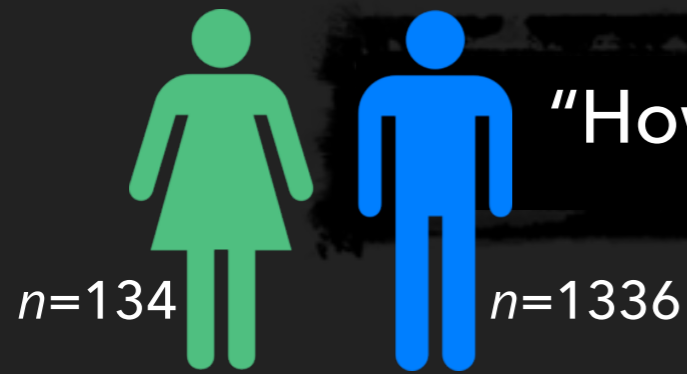


“How often is this a barrier for you?”

WILCOXON RANK SUM TEST

$\alpha = .05$; $\alpha = 0.0012$ with Bonferroni Correction

Barrier	p-value	SigDiff	Effect Size	Women Likert	Men Likert
Intimidating Community Size	<0.001	★	0.5		
Awareness of Features	<0.001	★	0.5		
Stranger Discomfort	<0.001	★	0.4		
Qualifications	<0.001	★	0.4		
Perception Of Slacking	0.001	★	0.4		
Fear of Negative Feedback	0.003		0.4		

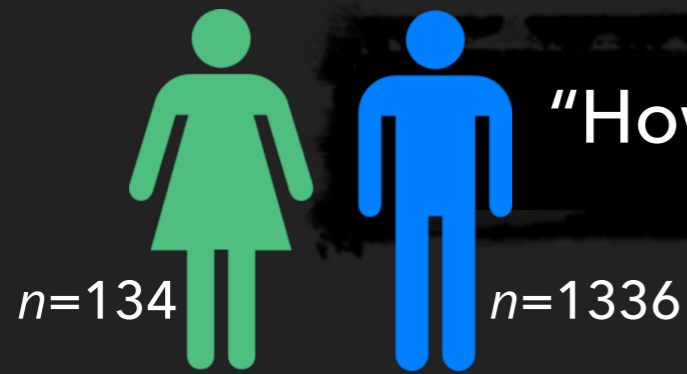


"How often is this a barrier for you?"

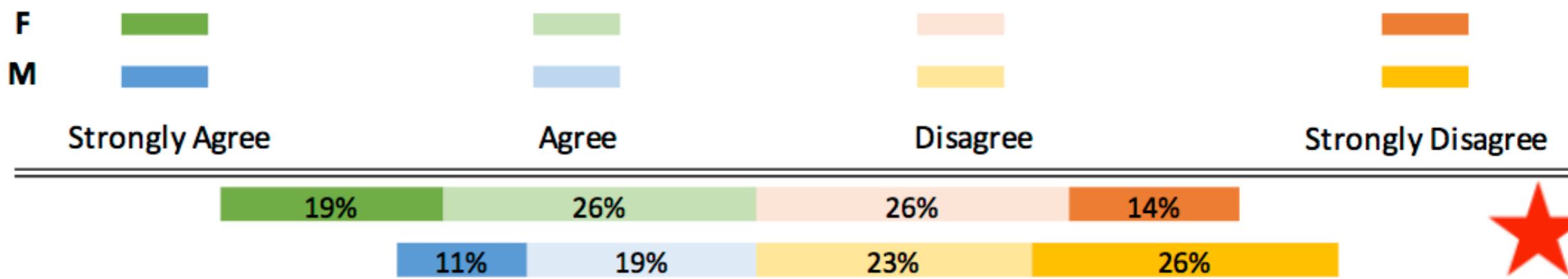
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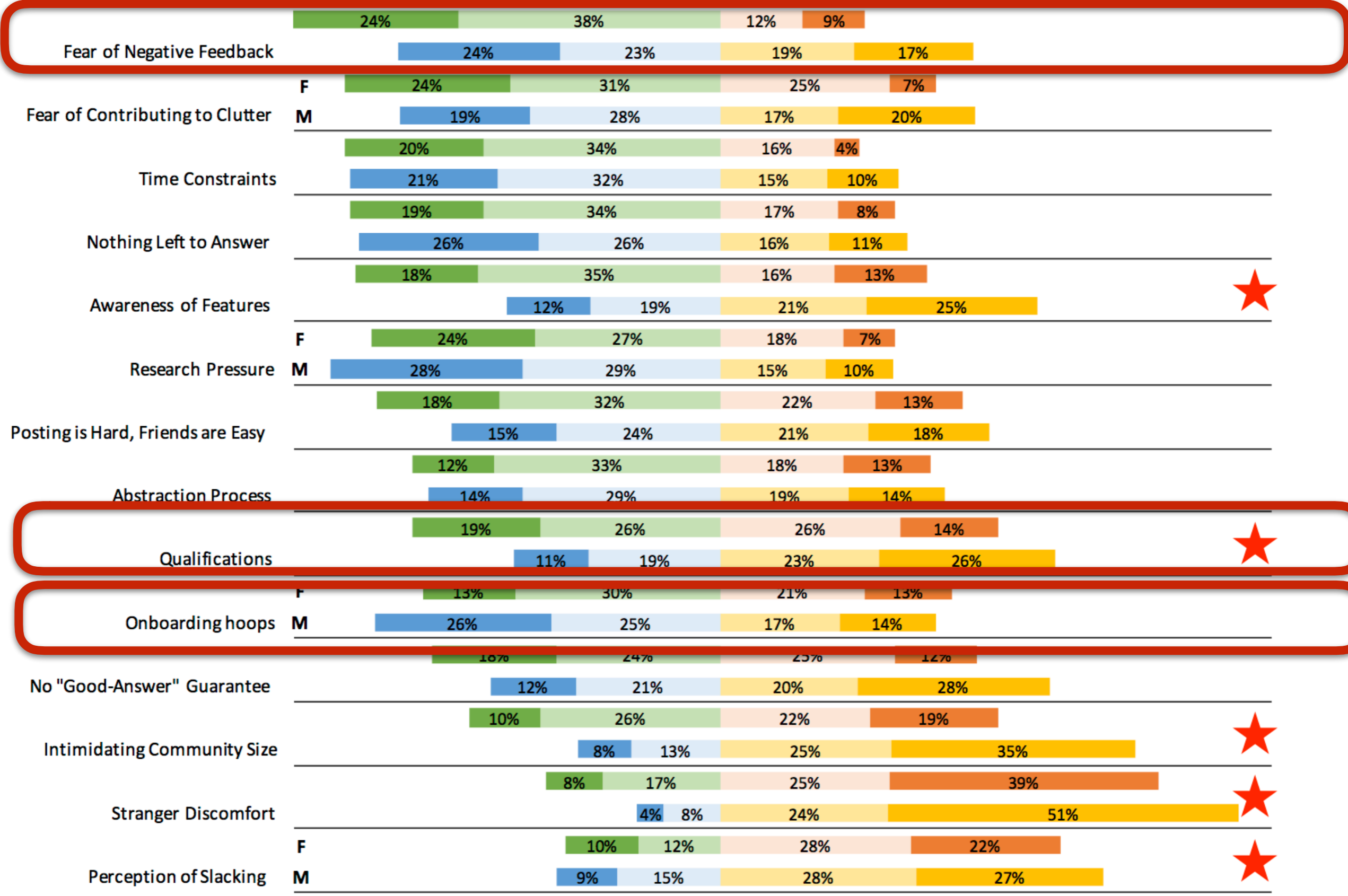
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“How often is this a barrier for you?”





- **Language Divide:** There are two types of language that
- contribute to the unwelcoming atmosphere on Stack
- Overflow: complex questions and idle “boy's club” chatter

■ **Language Divide:** There are two types of language that contribute to the unwelcoming atmosphere on Stack Overflow: complex questions and idle “boy's club” chatter

■ **Helpful Intentions:** Participants want to contribute, but do not feel like they can based on difficulty finding opportunities to post

IMPACT OF IDENTIFYING BARRIERS

IMPACT OF IDENTIFYING BARRIERS



Jeff Atwood
@codinghorror

Following



I am a big fan of this new feature Stack Overflow added. A research study via [@DenaeFord](#) in mid-2016 highlighted the need, and I forwarded multiple rounds of direct email feedback at that time. Glad to see it finally getting worked on.

Your Answer



[Petruza](#) is a new contributor. Be nice, and check out our [Code of Conduct](#).

Stack Overflow founder acknowledges novice implications of the work

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Barriers also resonate with SO users on blog.denaeford.me

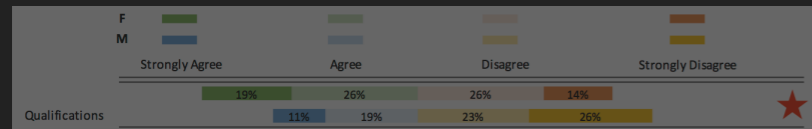


Really interesting. As a female, minimally-active, but long-time/frequent reader of SO I definitely went through a ran emotions from of early, naive use, intimidation, empathy, regret, etc. I a period of pretty active answering on another SE board gave me a much better understanding of the source of some frustration (and seeming hostility) for SO power users. The Help Vampire is real, and I can see how it'd be easy to become impatient with that. I really like the question suggestion feature, and when editors take the time to comment with the asker in mind, I think it can make a big difference.

TODAY

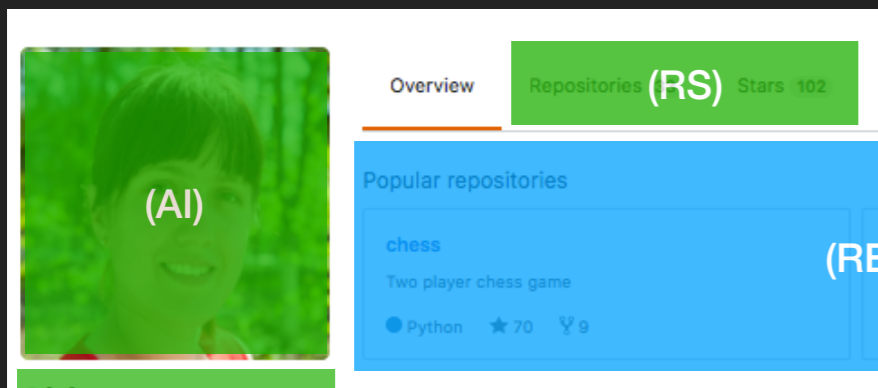
Barriers to Participation

[Ford, Smith, Guo, Parnin. FSE 2016]



Mentorship

[Ford, Lustig, Banks, Parnin. CHI 2018]



Vision

The Future of Asking

Questions are ill-received

- 0 Why aren't my icons showing?
- 0 Why aren't my rectangles showing? 1
- 0 IF... Else + JOption, Why aren't my JOptionPanes showing? 2
- 1 Why Aren't My Cards Random? 3
- 3 Why aren't my divs showing up? [closed] 2
- 0 Why aren't my validation messages showing? 1

Questions do not follow community etiquette



2 hrs · Seattle, WA · 

More often than not, my posts get downvoted because I didn't follow some arcane etiquette. This hostility to outsiders and new contributors is exactly why I've never bothered editing Wikipedia.

Interested in contributing but don't know how

"Is there some trick to making it worthwhile to post on Stack Overflow?"



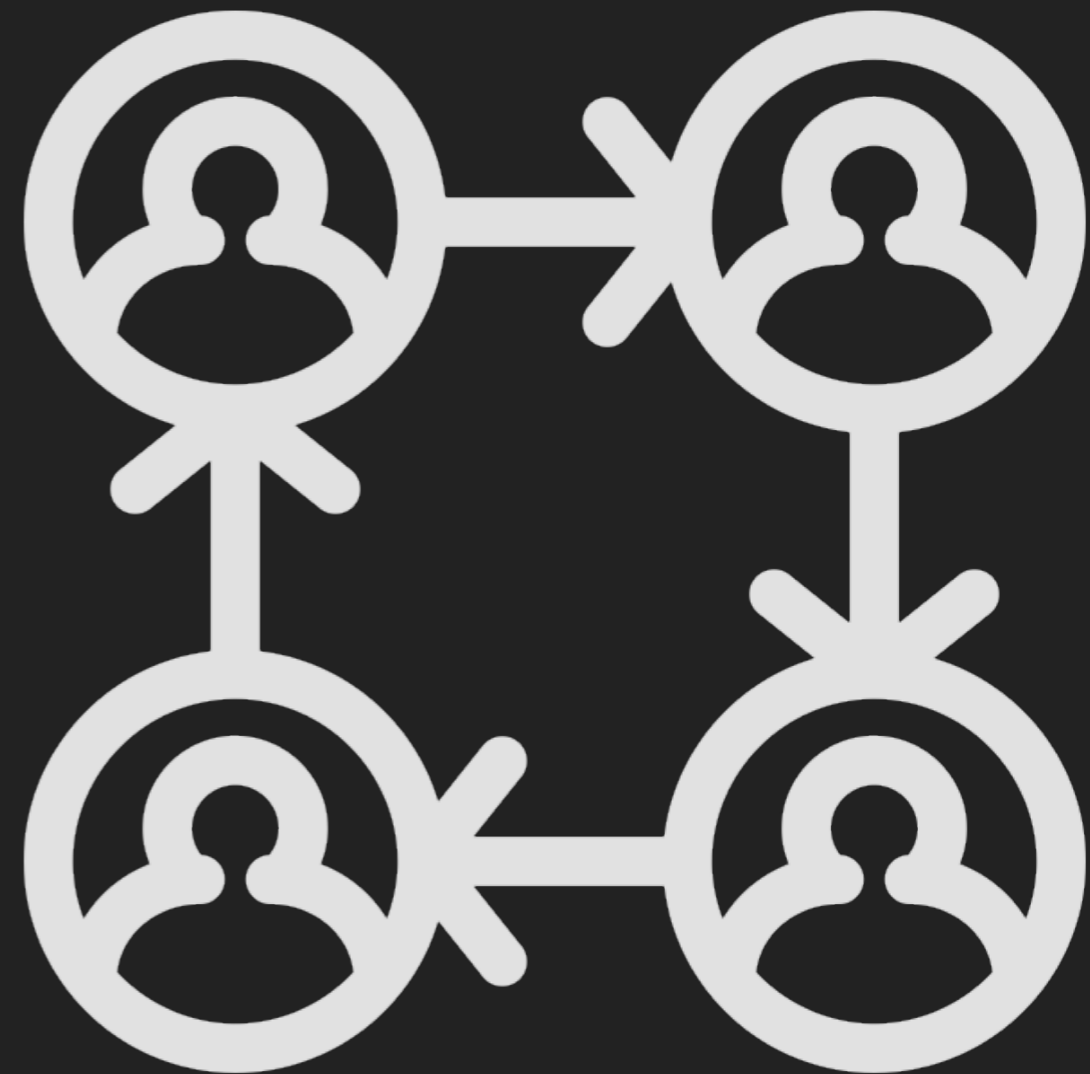
RQ

How can users encourage novices to ask well-received questions?



as a

Community of Practice



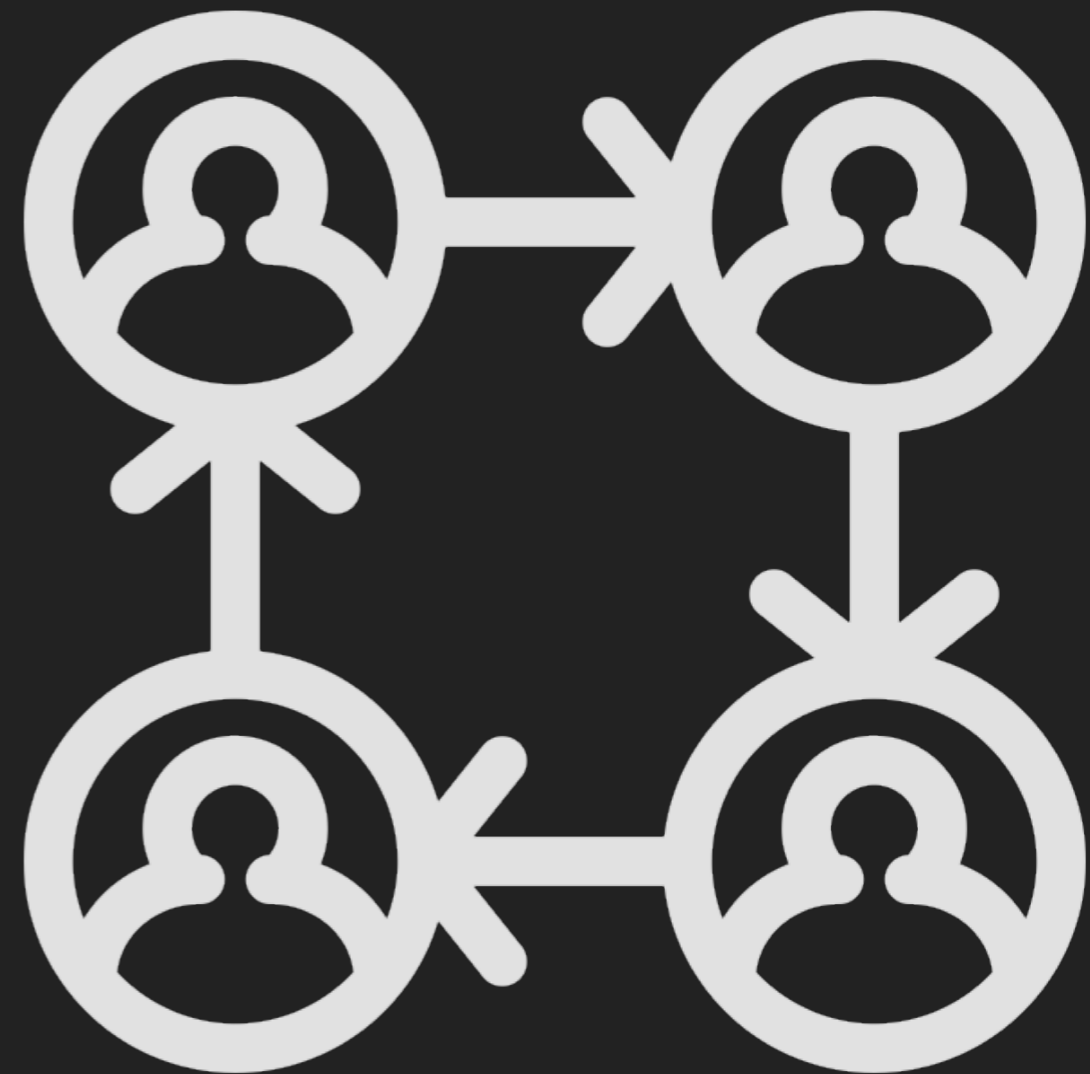


as a

Community of Practice

where *groups of people bound together by shared expertise and passion for a joint goal*

[Lave 1991]



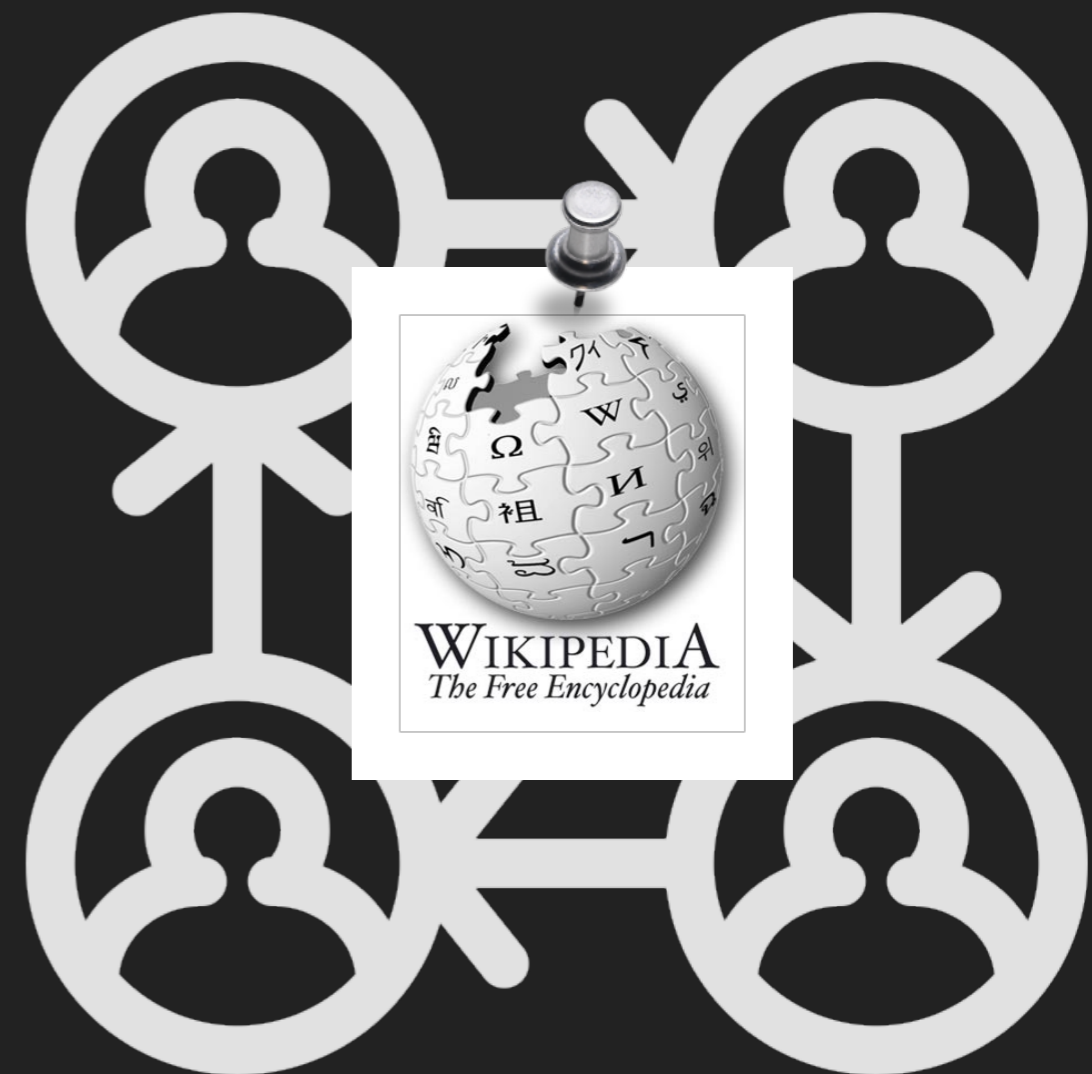


as a
Community of Practice

where *groups of people bound together by shared expertise and passion for a joint goal*
[Lave 1991]

Learning through mutual engagement.

Mutual engagement exposes newcomers to expert practices [Wenger 1998]



EXPLORATORY STUDY

The image shows a Slack interface on the left and a conversation thread on the right. The Slack sidebar on the left includes a search bar, 'All Threads', 'Channels' (with #donotuse, pilot1, pilot2, and researchteam), and 'Direct Messages' (with slackbot, dford (you), ajax, apollo, ares, and castor). Two orange callout boxes are overlaid on the sidebar: 'novice' points to the pilot2 channel, and 'mentor' points to the dford (you) direct message.

The conversation thread on the right shows a message from **ajax** at 12:57 PM: "I've been working out of Python 2.7 and I found it difficult to determine which posts are for python 3 and which are for older versions. Do you know if there's a way to easily check this?"

A response from **apollo** at 7:09 PM follows: "@ajax Unfortunately, there isn't as far as I know. Most people just tag it as python, not the version. Sometimes I will edit the post to add Python 3 sample code if it isn't already there. For example:"

A screenshot of a search result is shown, titled "Q: Problems installing python3 on RHEL". The text reads: "I'm trying to install **python3** on RHEL using the following steps. The search matches found for: **python3** Followed by: yum search python3. What should I try next? ...". Below the text are three tags: `python`, `python-3.x`, and `rhel`.

Below the screenshot, the text continues: "The tag python-3.x. But it's pretty inconsistent as to whether people use that tag".

A final message from **ajax** at 7:11 PM says: "Ohh so there is a tag they can use, they just don't typically use it. okay, well thanks!"

The image shows a Slack interface on the left and a conversation thread on the right. The Slack sidebar includes a search bar, 'All Threads', 'Channels' (with # donotuse, pilot1, pilot2, and researchteam), and 'Direct Messages' (with slackbot, dford (you), ajax, apollo, ares, and castor). Two orange callout boxes are overlaid on the Slack sidebar: 'novice' points to the 'pilot2' channel, and 'mentor' points to the 'dford (you)' direct message.

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A response from **apollo** at 7:09 PM follows: "@ajax Unfortunately, there isn't as far as I know. Most people just tag it as python, not the version. Sometimes I will edit the post to add Python 3 sample code if it isn't already there. For example:"


An embedded image shows a search result snippet for "Q: Problems installing python3 on RHEL". The snippet text is: "I'm trying to install **python3** on RHEL using the following steps. The search matches found for: **python3** Followed by: yum search python3. What should I try next? ...". Below the text are three tags: `python`, `python-3.x`, and `rhel`. The `python-3.x` tag is highlighted with an orange box.

Below the image, text reads: "The tag python-3.x. But it's pretty inconsistent as to whether people use that tag".

A final message from **ajax** at 7:11 PM says: "Ohh so there is a tag they can use, they just don't typically use it. okay, well thanks!".

Context switching
between platform


The screenshot shows a Slack interface on the left with a sidebar containing channels like #donotuse, #pilot1, #pilot2, and #researchteam, and direct messages with slackbot, dford, ajax, apollo, ares, and castor. The main window shows a conversation:

- novice** (ajax) 12:57 PM: I've been working out of Python 2.7 and I found it difficult to determine which posts are for python 3 and which are for older versions. Do you know if there's a way to easily check this?
- mentor** (apollo) 7:09 PM: @ajax Unfortunately, there isn't as far as I know. Most people just tag it as python, not the version. Sometimes I will edit the post to add Python 3 sample code if it isn't already there. For example:
Pasted image at 2017-03-29, 7:10 PM

The tag python-3.x. But it's pretty inconsistent as to whether people use that tag
- novice** (ajax) 7:11 PM: Ohh so there is a tag they can use, they just don't typically use it. okay, well thanks!

Context switching
between platform

Asynchronous
communication

The screenshot shows a Slack interface with a sidebar on the left containing channels like #donotuse, #pilot1, #pilot2, and #researchteam, and direct messages with slackbot, dford, ajax, apollo, ares, and castor. The main chat area shows a conversation:

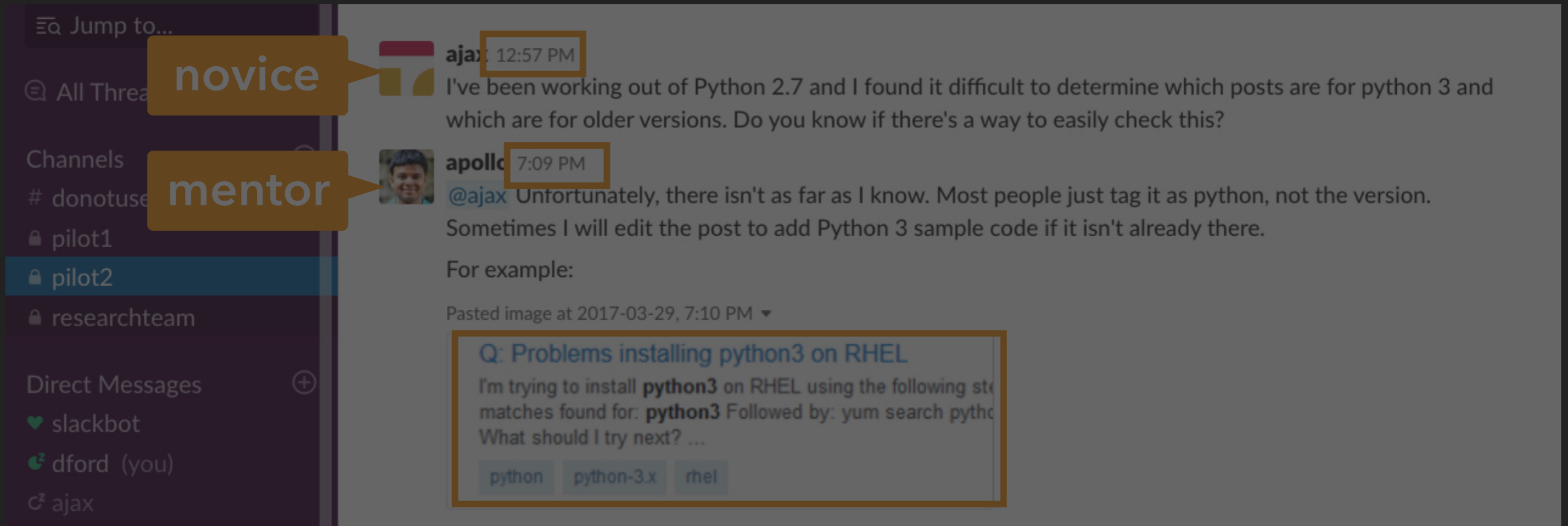
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Context switching
between platform

Asynchronous
communication

Dialogue did not
refine questions

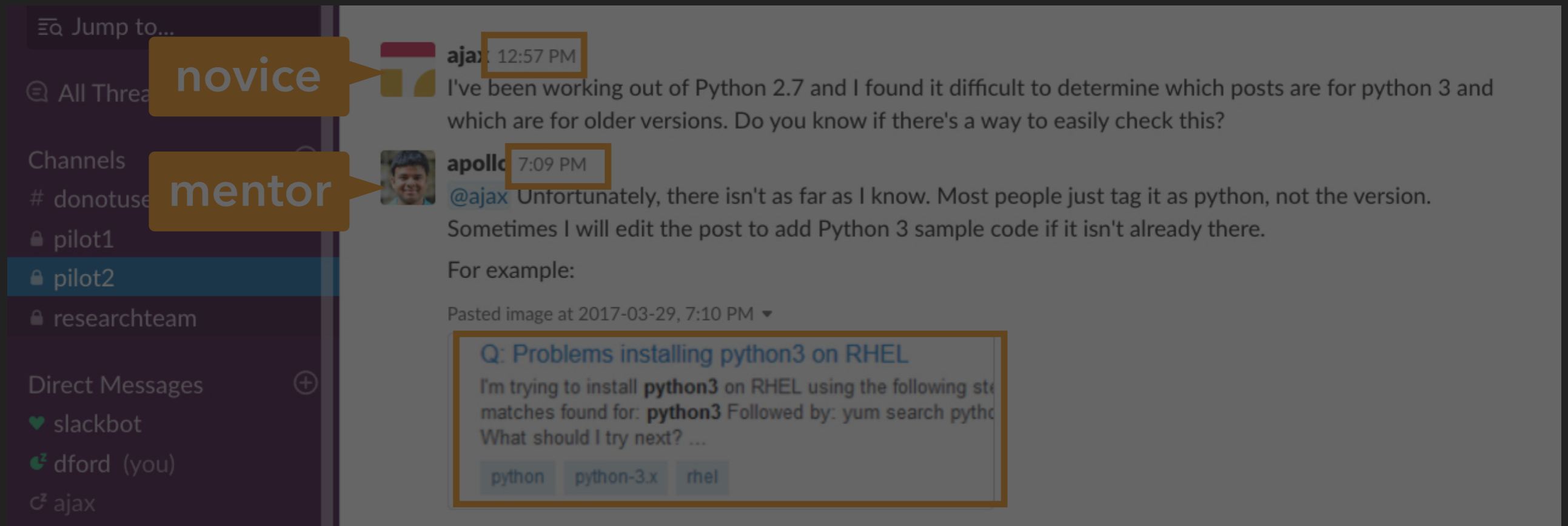
DESIGN PRINCIPLES



Content switching
between platform

Asynchronous
communication

Dialog and not
refinement



[Epstein et al., 2002]

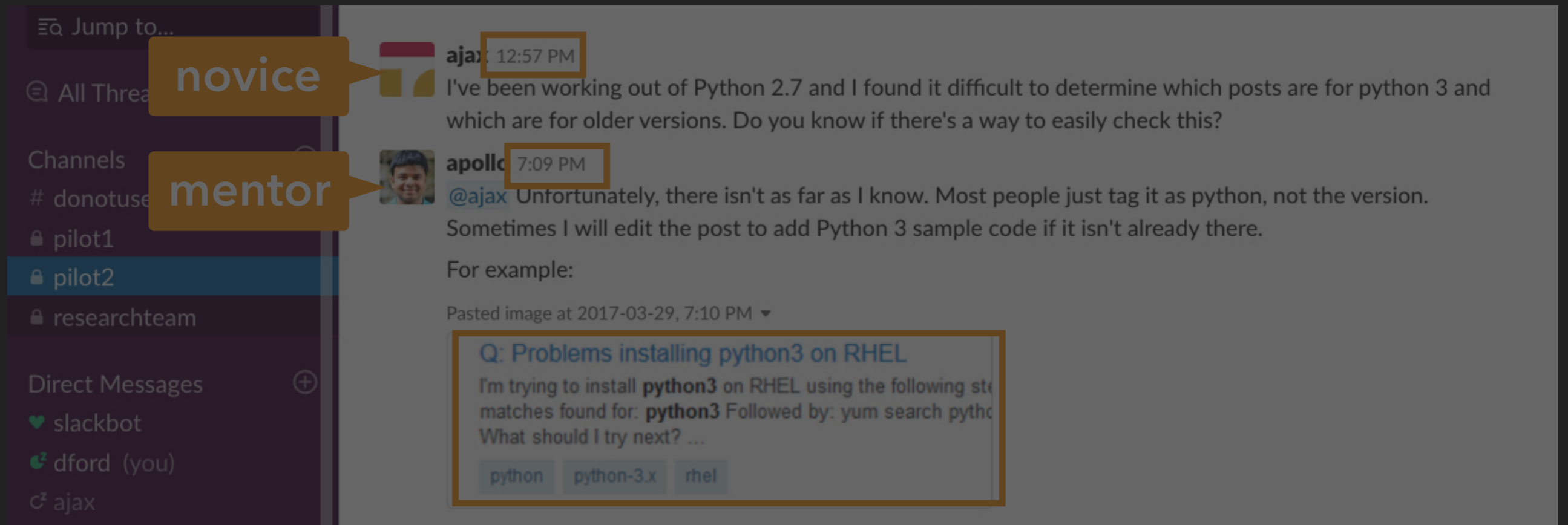
[Kraut et al., 2012]

Allow mistakes in private space



~~Asynchronous communication~~

~~Dialog should not refine conversations~~



[Epstein et al., 2002]
[Kraut et al., 2012]

Allow mistakes in private space



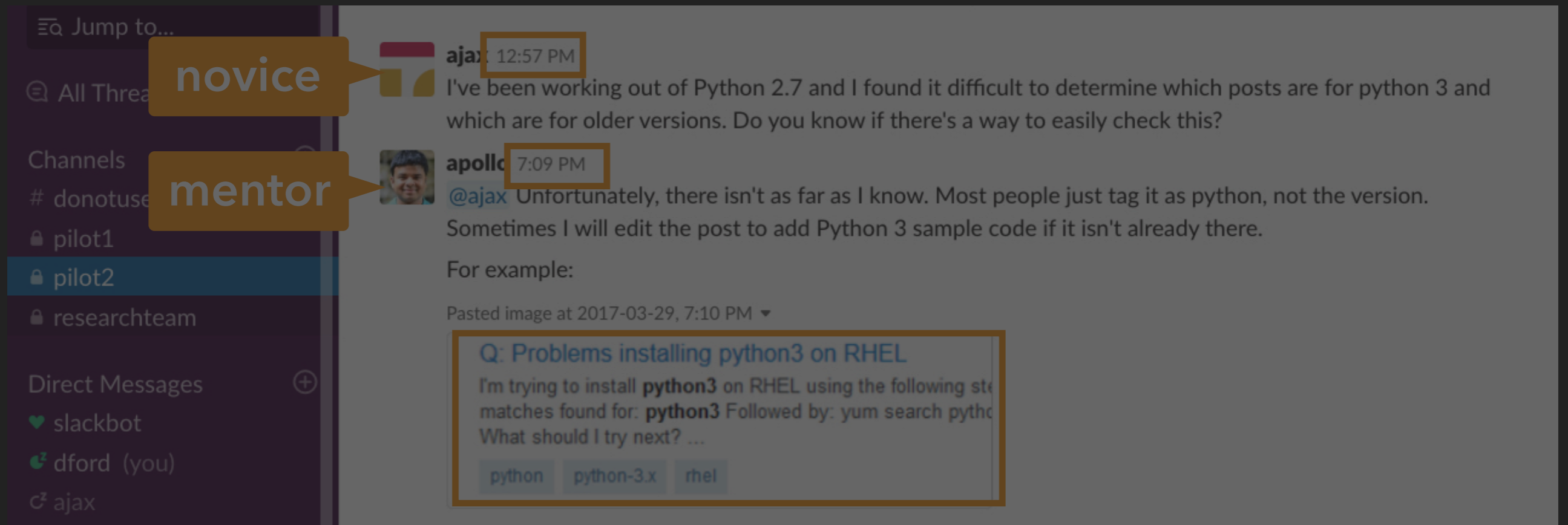
[Baron 1993] [Ford et al., 2016]
[Kraut et al., 2012]

Provide formative and timely feedback



Dialog should not refine questions





[Epstein et al., 2002]
[Kraut et al., 2012]

Allow mistakes in private space



[Baron 1993] [Ford et al., 2016]
[Kraut et al., 2012]

Provide formative and timely feedback



[Wenger, 1998]
[Kraut et al., 2012]

Do not answer questions, help others ask better questions



COLLABORATIVE EDITING



stack overflow

COLLABORATIVE EDITING

Two core components:



stack overflow

COLLABORATIVE EDITING

Two core components:

- 1 Collaborative question draft



The screenshot shows a Stack Overflow question draft interface. On the left, there is a user profile for 'Mason' with a rabbit avatar. The main content area contains the question title 'Why aren't my arrays showing updates?', the tag 'javascript', and the text 'Hello, can you please help?'. Below the text is a code block with the following JavaScript code:

```
if (x) {  
  print ("hello world!")  
};
```

 At the bottom of the draft, there are two buttons: 'edit' and 'copy draft back to Stack Overflow'.



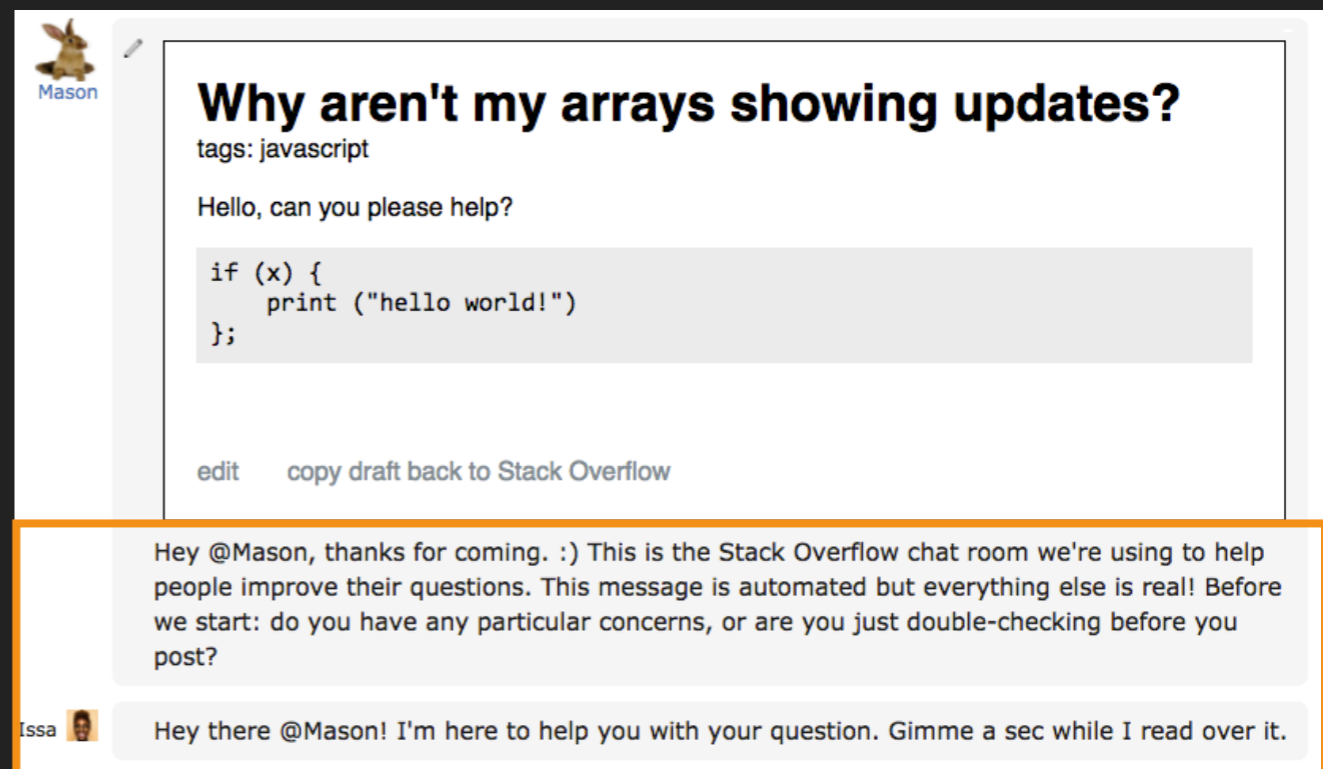
stack overflow

COLLABORATIVE EDITING

Two core components:

1 Collaborative question draft

2 *Help Room* to discuss and edit the draft



The screenshot shows a chat interface. At the top, a user named 'Mason' has posted a question draft titled 'Why aren't my arrays showing updates?' with a 'javascript' tag. The draft text says 'Hello, can you please help?' followed by a code block:

```
if (x) {  
  print ("hello world!")  
};
```

 Below the code are 'edit' and 'copy draft back to Stack Overflow' buttons. A system message follows: 'Hey @Mason, thanks for coming. :) This is the Stack Overflow chat room we're using to help people improve their questions. This message is automated but everything else is real! Before we start: do you have any particular concerns, or are you just double-checking before you post?'. At the bottom, a user named 'Issa' has responded: 'Hey there @Mason! I'm here to help you with your question. Gimme a sec while I read over it.'



stack overflow

Just-In-Time Mentorship Study

- ✓ To observe and measure changes in **question quality**
- ✓ To understand **feedback** provided by mentors
- ✓ To improve **experience** for new question askers
- ✓ To learn how to **scale these benefits** to the whole community

Novice writes question

The screenshot shows a Stack Overflow page. At the top, there is a navigation bar with links for Questions, Developer Jobs, Tags, and Users, along with a search box. Below the navigation bar, the title of the question is "Why aren't my arrays showing updates?". Underneath the title, there is a section titled "Questions that may already have your answer" which lists several related questions with their respective scores and counts. The questions listed are:

- 0 Why aren't my icons showing?
- 0 Why aren't my rectangles showing? 1
- 0 IF... Else + JOption, Why aren't my JOptionPanes showing? 2
- 1 Why Aren't My Cards Random? 3
- 3 Why aren't my divs showing up? [closed] 2
- 0 Why aren't my validation messages showing? 1

Below the list of related questions, there is a rich text editor for writing the question. The editor has a toolbar with various formatting options like bold, italic, link, quote, code, image, and list. The text entered in the editor is:

I am having a problem with getting this code to work.

```
if (x) {
    print("here is some sample code!")
};
```

Thank you.

Novice writes
question



Novice selects
to post their
question

Would you like an experienced Stack Overflow user to help refine your question before you post it? They're here to help!

No, just post my question

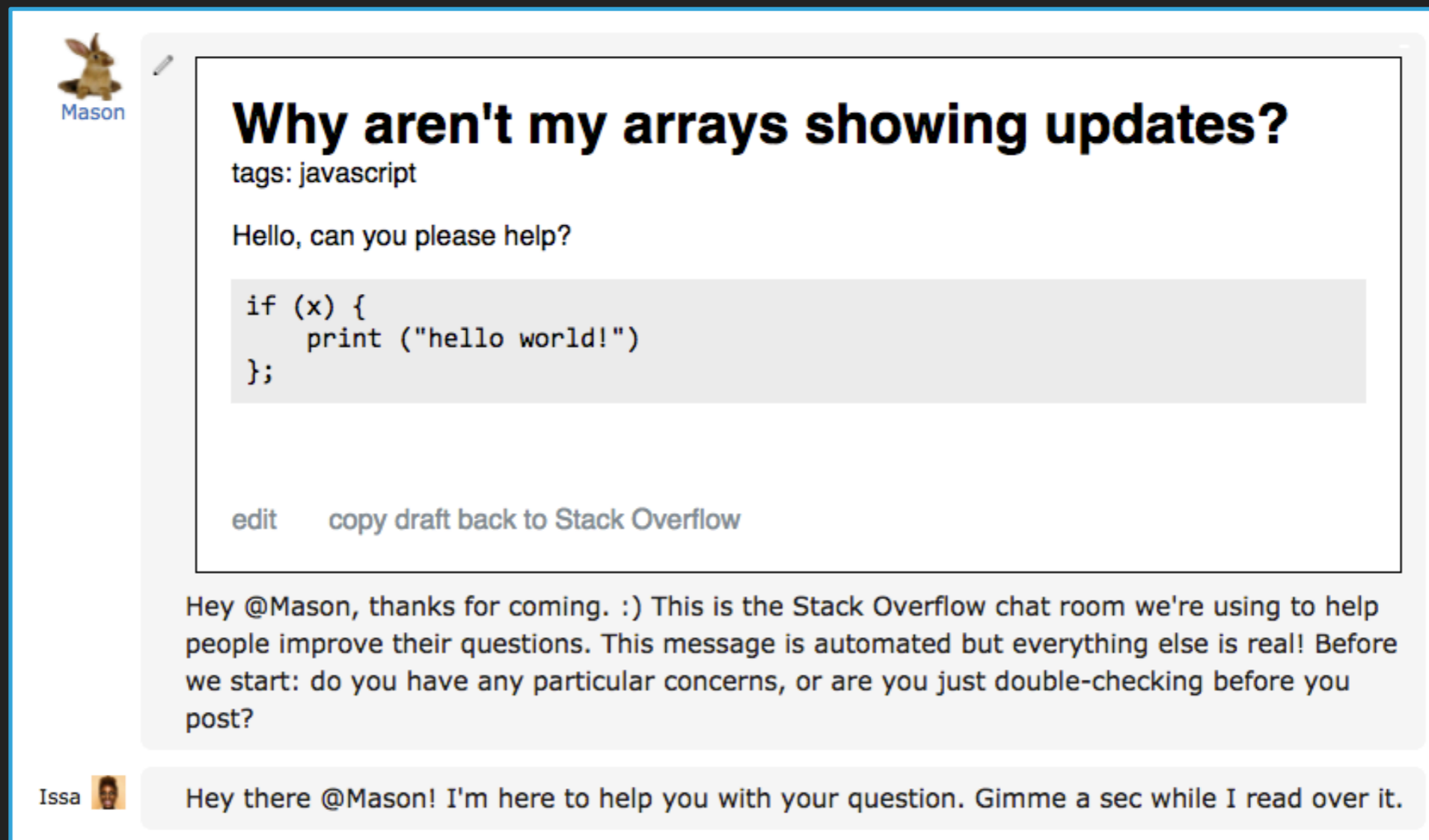
Yes, join mentorship chat



Novice writes question

Novice selects to post their question


Novice selects to join *Help Room*



The screenshot shows a chat interface with a user named Mason asking a question. The question is "Why aren't my arrays showing updates?" with a tag for "javascript". The code snippet is:

```
if (x) {  
  print ("hello world!")  
};
```

 Below the code are options for "edit" and "copy draft back to Stack Overflow". A response from Issa says: "Hey there @Mason! I'm here to help you with your question. Gimme a sec while I read over it."

 Mason

Why aren't my arrays showing updates?


tags: javascript

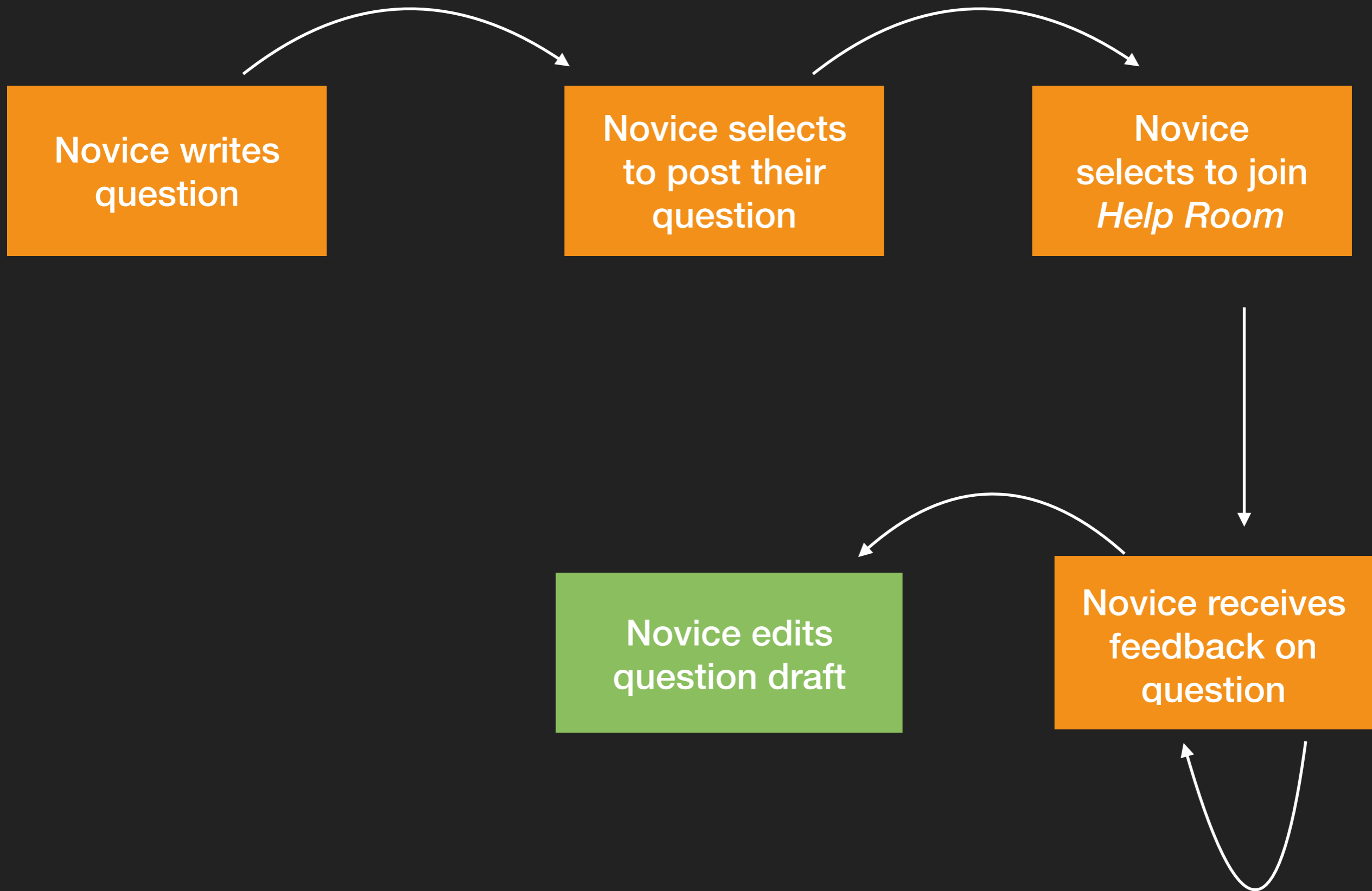
Hello, can you please help?

```
if (x) {  
  print ("hello world!")  
};
```

edit copy draft back to Stack Overflow

Hey @Mason, thanks for coming. :) This is the Stack Overflow chat room we're using to help people improve their questions. This message is automated but everything else is real! Before we start: do you have any particular concerns, or are you just double-checking before you post?

Issa  Hey there @Mason! I'm here to help you with your question. Gimme a sec while I read over it.



Novice writes question

Novice selects to post their question

Novice selects to join *Help Room*

Message in [B] Asking a Question

Edit

```
# Why aren't my arrays showing updates?  
tags: javascript  
Hello, can you please help?  
  
    if (x) {  
        print ("hello world!")  
    };  
Thank you!
```

Save Draft

You can format your posts using Markdown, [as described in our help center](#).

A few basics: you can apply inline code formatting using ``backticks``, and create code blocks by indenting with four spaces. Links are like this: [\[click here\]\(http://example.com\)](http://example.com).

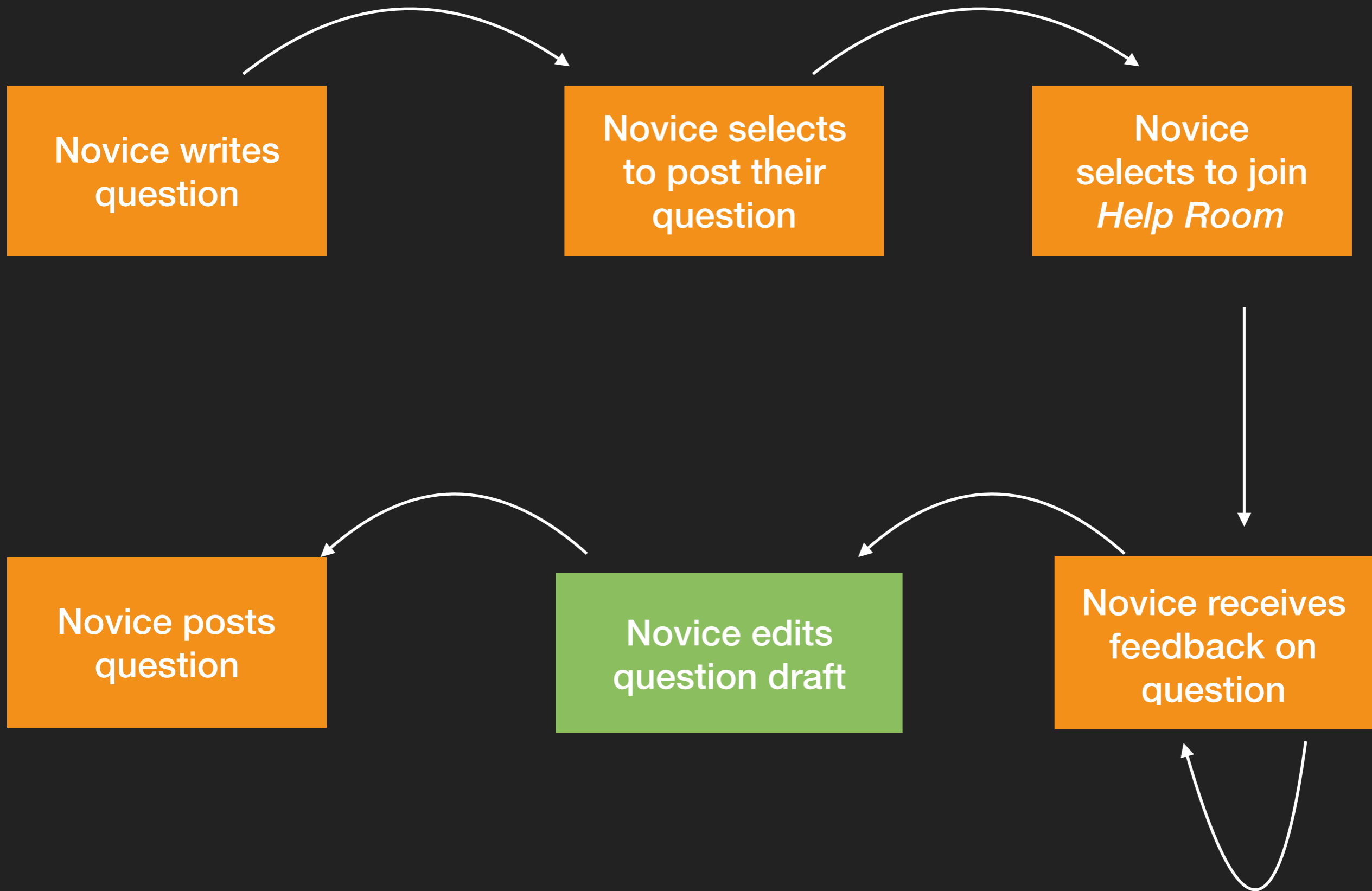
Mason 

Mon 3:42 PM

Why aren't my arrays showing updates?

tags: javascript

Novice receives feedback on question





33 day study

4 *Help Rooms*

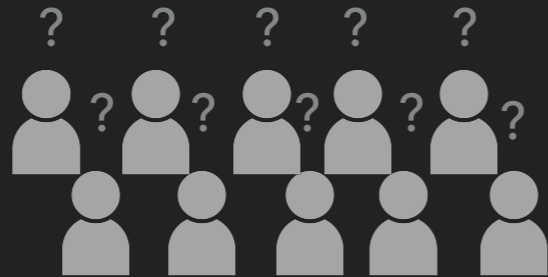
1 *Private Mentor
Room*



33 day study

4 *Help* Rooms

1 *Private Mentor*
Room



71,068

Eligible Novices



520

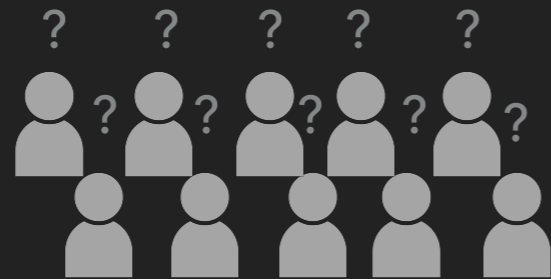
Entered Room



33 day study

4 *Help* Rooms

1 *Private Mentor*
Room



71,068

Eligible Novices



520

Entered Room



343
conversations

271 Novices

63 Mentors



33 day study

4 *Help* Rooms

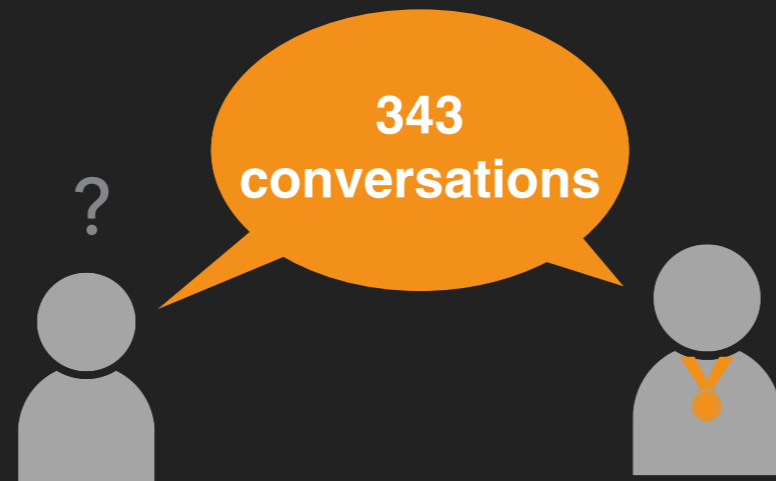
1 *Private Mentor*
Room



71,068
Eligible Novices

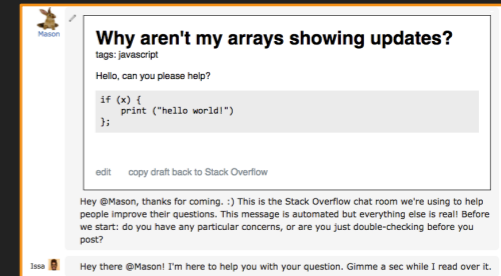


520
Entered Room



271 Novices

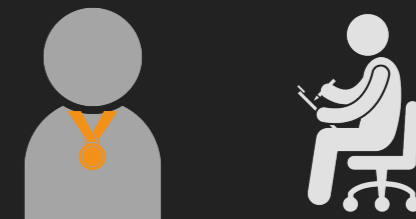
63 Mentors



Transcripts + Question Scores



Surveyed Novices



Interviewed Mentors

MENTORED QUESTIONS HAVE HIGHER QUALITY. ⁴⁶



MENTORED QUESTIONS
HAD A **50% SCORE**
INCREASE ON
AVERAGE



GOOD

NEUTRAL

BAD

	GOOD	NEUTRAL	BAD
mentored	25%	49%	25%
not mentored (control)	18%	51%	30%

$\chi^2 = 7.48, p = 0.023$

[CHI 2018]

MENTORS SUGGEST HIGH-FIDELITY IMPROVEMENTS. ⁴⁷

Paraphrasing title and content (Question Phrasing)

Formatting code to make question scannable

Community triage

Including all the pieces of a question (Question Framing)

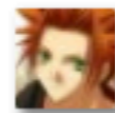
Culture of asking

“ok the fact is that on SO **you can't ask for libs you would need to do that on another site [link]**” (Mentor)

bash csh

share edit flag

edited Mar 4 '17 at 9:51



Cœur

12.4k ● 3 ● 79 ● 113

asked Apr 26 '10 at 2:23



Daniel

336 ● 3 ● 5 ● 18

closed as off-topic by [bummi](#), [Toto](#), [Petr Janeček](#), [keyser](#), [mehow](#) Sep 3 '13 at 12:49

This question appears to be off-topic. The users who voted to close gave this specific reason:

- "Questions on **professional server- or networking-related infrastructure administration** are off-topic for Stack Overflow unless they directly involve programming or programming tools. You may be able to get help on [Server Fault](#)." – [Toto](#), [Petr Janeček](#), [keyser](#), [Community](#)

If this question can be reworded to fit the rules in the [help center](#), please [edit the question](#).

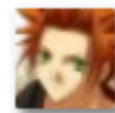
1 [More appropriate for Super User or Server Fault?](#) – [sblom](#) Apr 26 '10 at 2:26

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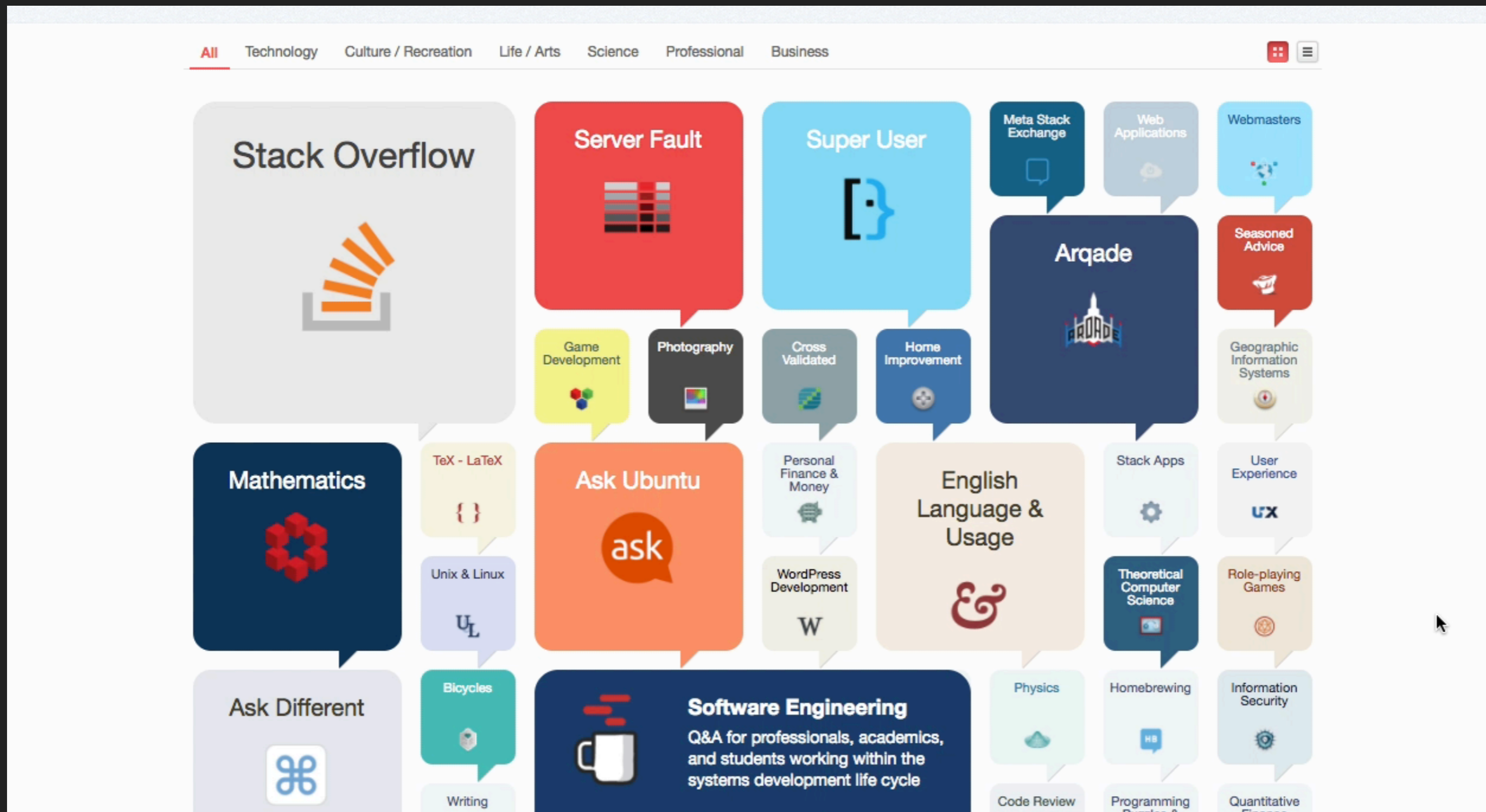
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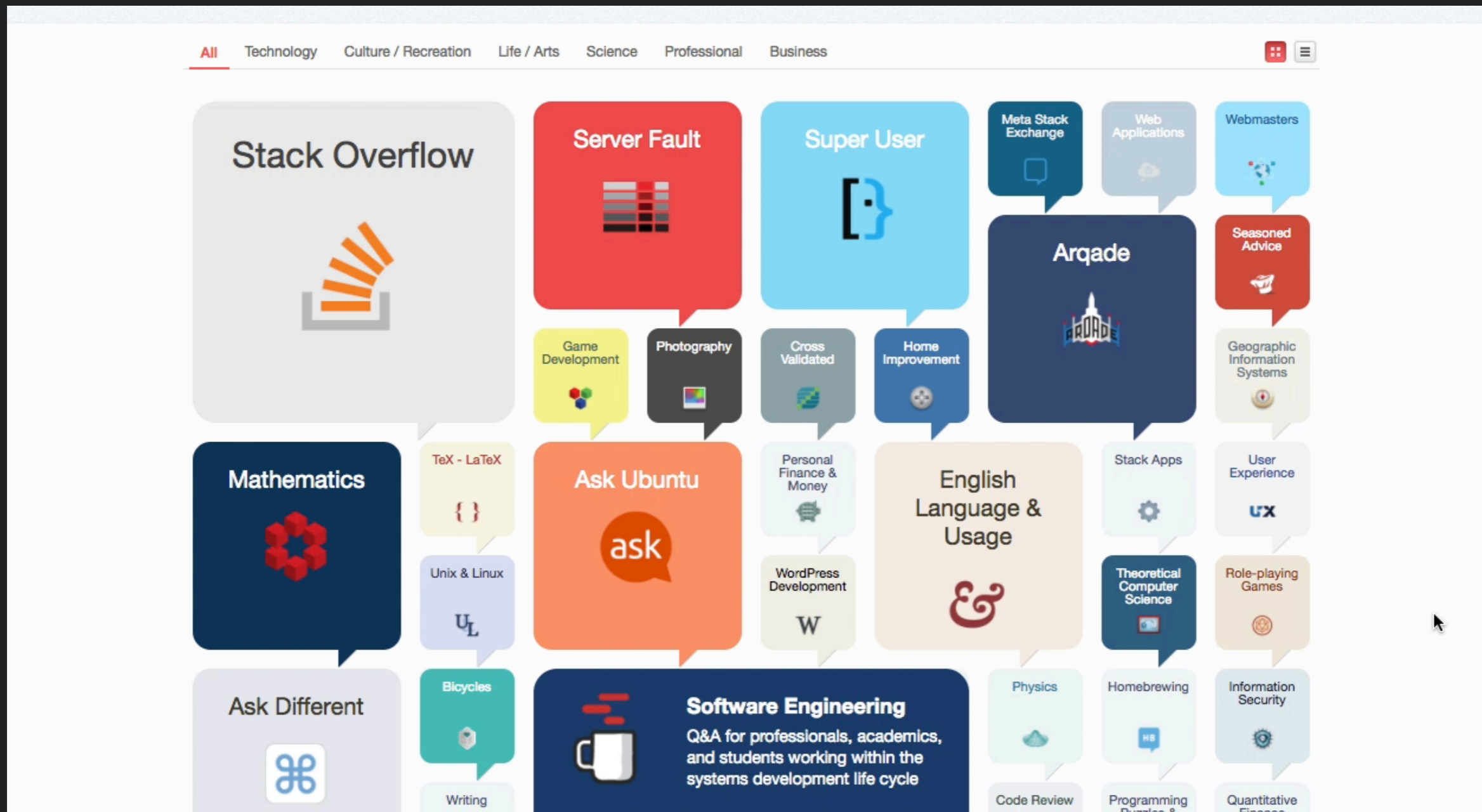
COMMUNITY TRIAGE

“ok the fact is that on SO you can't ask for libs you would need to do that on another site [link]” (Mentor)



COMMUNITY TRIAGE

“ok the fact is that on SO you can't ask for libs you would need to do that on another site [link]” (Mentor)



“ok the fact is that on SO you can't ask for libs you would need to do that on another site [link]” (Mentor)

“How do I hack a wifi password?” (Novice)

“Your question is **off topic** here. We're not a hacking service.”(Mentor)

“You also might want to edit out the “Thank you!” at the end. **I know it seems polite, but people object to it on SO.**”
(Mentor)

Converting Javascript Ajax code to jQuery [closed]

▲ I need converting this code to jQuery.

-3 Thank you very much.

▼
★

```
function myItem(id, page) {
  AjaxPost(WEB_URL+'/myitems.inc.php', "page="+page+"&id="+id,
    function () {
      if (xmlHttp.readyState == 4 || xmlHttp.readyState == "complete") {
        div('myItem_box').innerHTML += xmlHttp.responseText;
      }
    }
  )
}
```

javascript jquery ajax

share edit flag

edited Nov 3 '13 at 18:56



Marcel Korpel
18.7k ● 4 ● 51 ● 71

asked Nov 3 '13 at 18:51



Peter
1 ● 1

“You also might want to edit out the “Thank you!” at the end. **I know it seems polite, but people object to it on SO.**”
(Mentor)

Converting Javascript Ajax code to jQuery [closed]

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-3

Thank you very much.



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javascript jquery ajax

share edit flag

edited Nov 3 '13 at 18:56



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18.7k ● 4 ● 51 ● 71

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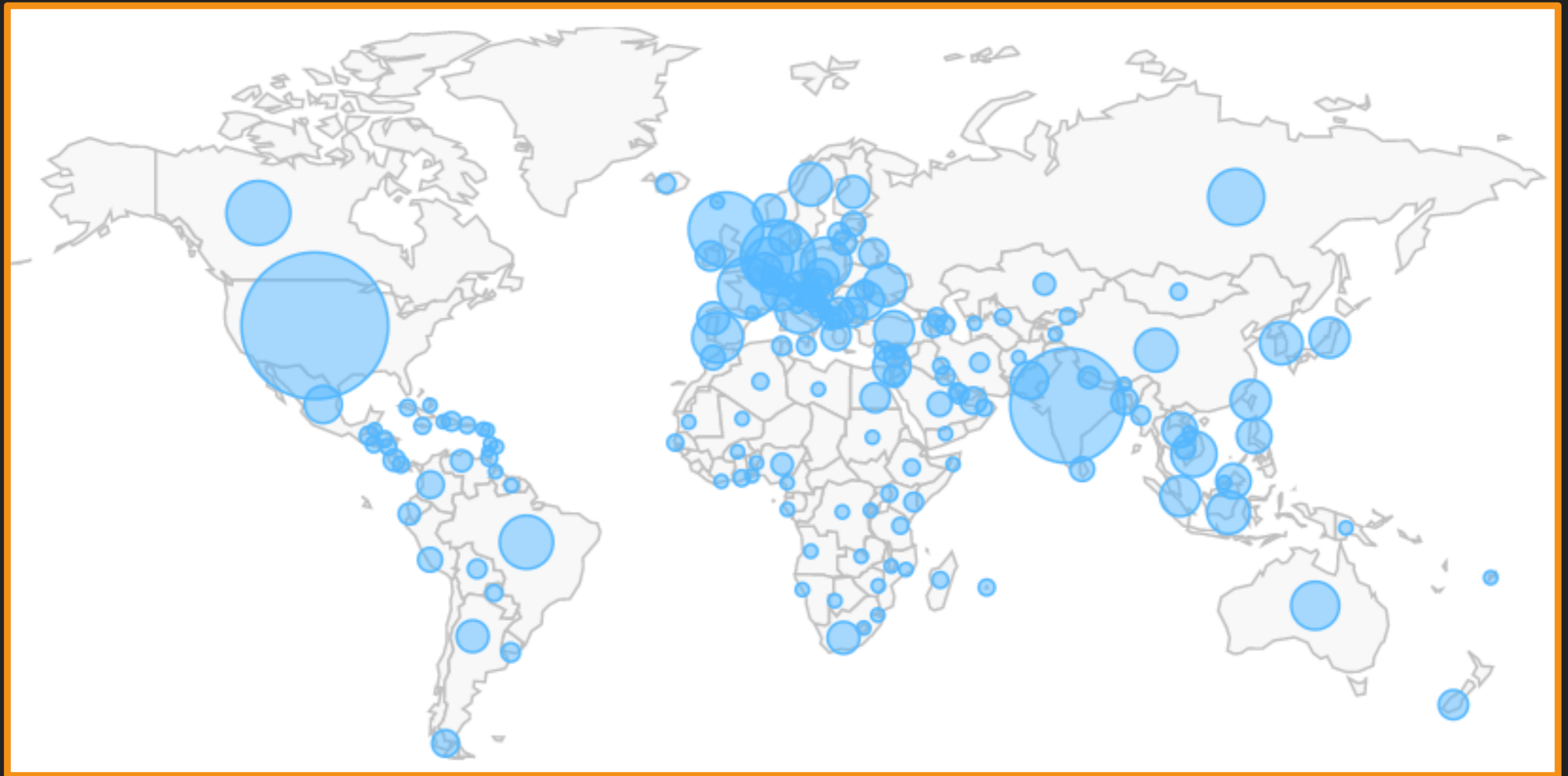
Peter
1 ● 1

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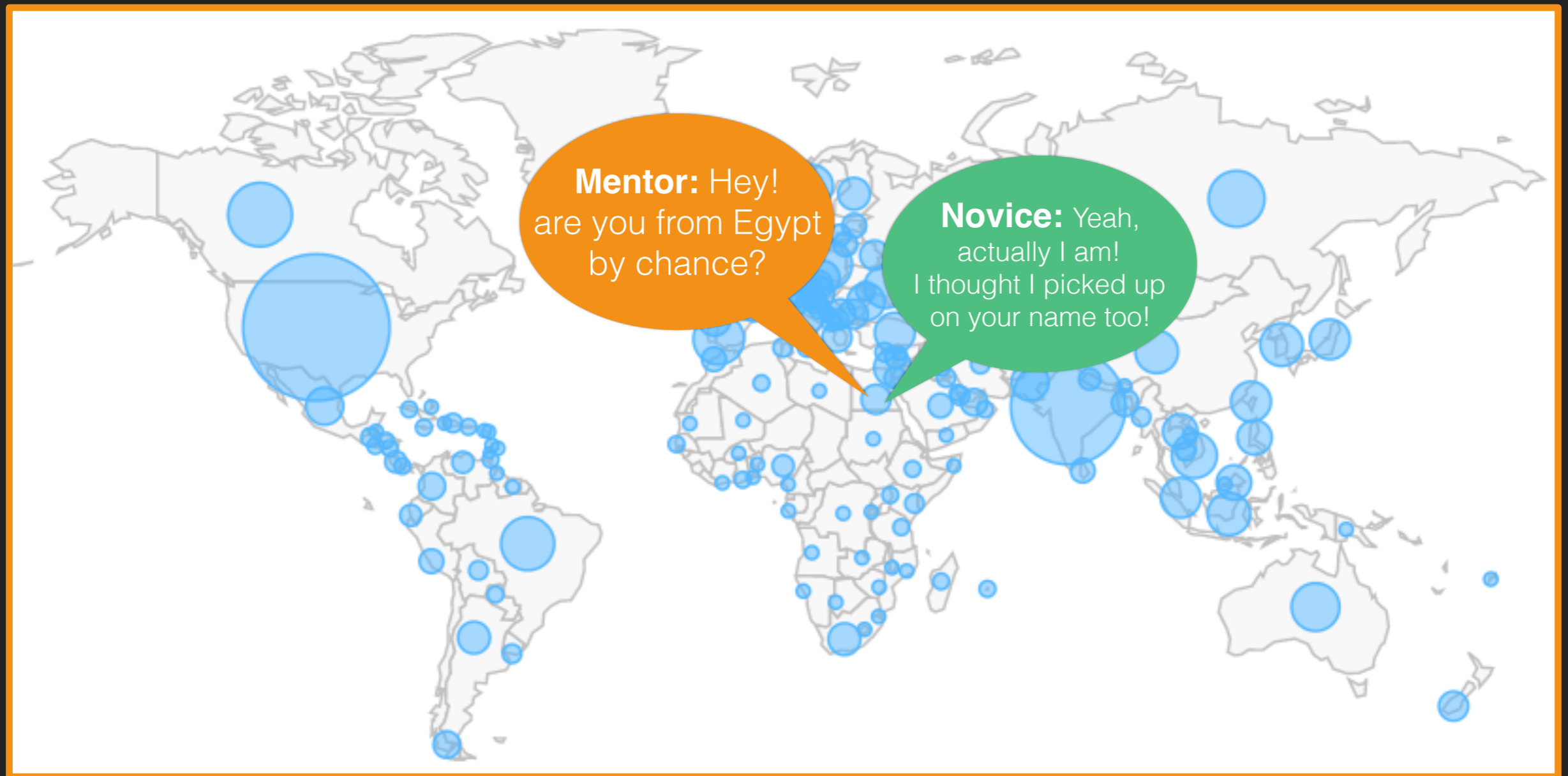
“**While it’s good to be social**, it’s kind of just fluff on a Q&A site.” (Mentor)

“Ok thanks for you help. I hope this time people won’t **attack me.**” (Novice)

Mentors used identity as a signal. How and why?



Mentors used identity as a signal. How and why?



Mentors used identity as a signal. How and why?

Mentor: Hey! are you from Egypt by chance?

Novice: Yeah, actually I am! I thought I picked up on your name too!

Edit your profile

Public information

 **Display name**
Yossef

recent names: 1

Location
Egypt

Title
No title has been set

About me

B I         

IMPACT OF JUST-IN-TIME MENTORSHIP

IMPACT OF JUST-IN-TIME MENTORSHIP

Stack Overflow Isn't Very Welcoming. It's Time for That to Change.



by Jay Hanlon on April 26, 2018



6.5K

We **<3** and believe in Stack Overflow. But sometimes, loving something means caring enough to admit that it has a problem.

Let's start with the painful truth:

- Too many people experience Stack Overflow¹ as a hostile or elitist place, especially newer coders, women, people of color, and others in marginalized groups.
- Our employees and community have cared about this for a long time, but we've struggled to talk about it publicly or to sufficiently prioritize it in recent years. And results matter more than intentions.

EVP acknowledges
community challenge how
mentorship forged a new
experience

IMPACT OF JUST-IN-TIME MENTORSHIP

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EVP acknowledges community challenge how mentorship forged a new experience

Resulted in Question Asking Template for Novices

Tags Title **Description** Review

Tell us more about your question

Your description gives people the information they need to answer your question.

Guided Mode

Summarize the problem.

Provide background and tell us what you've already tried.

Show your code.

Describe expected and actual results.

Include details about your goals and problem. For example:

✓ Say "I'm setting up a new server, and want to support UTF-8 fully in my web application. Where do I need to set the encoding/charsets?"

✗ Don't say "I want to support UTF-8 fully in my web application."

🔗 Want more help? Check out [these examples](#) of great question descriptions.

Next

IMPACT OF JUST-IN-TIME MENTORSHIP

Stack Overflow Isn't Very Welcoming. It's Time for That to Change.



by Jay Hanlon on April 26, 2018

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- Our employees and community have cared about it publicly or to sufficiently prioritize it in our internal intentions.



Julia Silge
@juliasilge

Follow

Probably my favorite academic research partnership to date was the mentorship experiment, headed up by [@kristinalustig](#) and [@DenaeFord](#). We are excited to be more organized from here on out to make space for more great projects! 🎉



Mentorship Research Project - Results + Wrap-Up

Check out SO Podcast 117 to hear Kristina talk about the mentorship experiment. First, if you haven't read the original announcement post about the Stack Overflow ... meta.stackoverflow.com

EVP acknowledges challenge how to forged a new experience

Resulted in Question Asking Template for Novices

Answer your question.

Include details about your goals and problem. For example:

- ✓ Say "I'm setting up a new server, and want to support UTF-8 fully in my web application. Where do I need to set the encoding/charsets?"
- ✗ Don't say "I want to support UTF-8 fully in my web application."

🔗 Want more help? Check out [these examples](#) of great question descriptions.

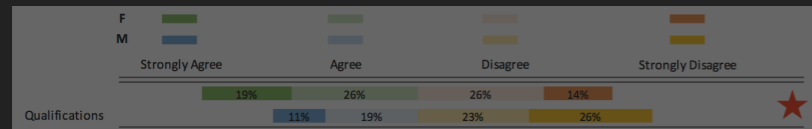
Provide background and tell us what you've already tried.

Show your code.

Describe expected and actual results.

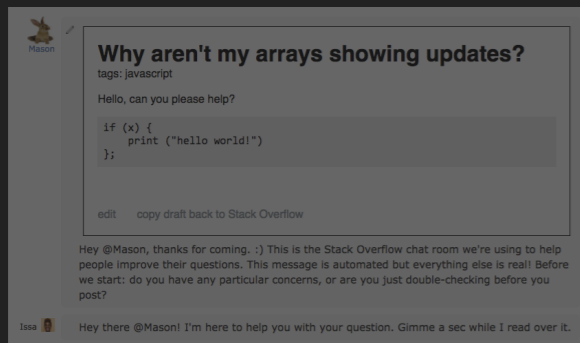
Next

TODAY



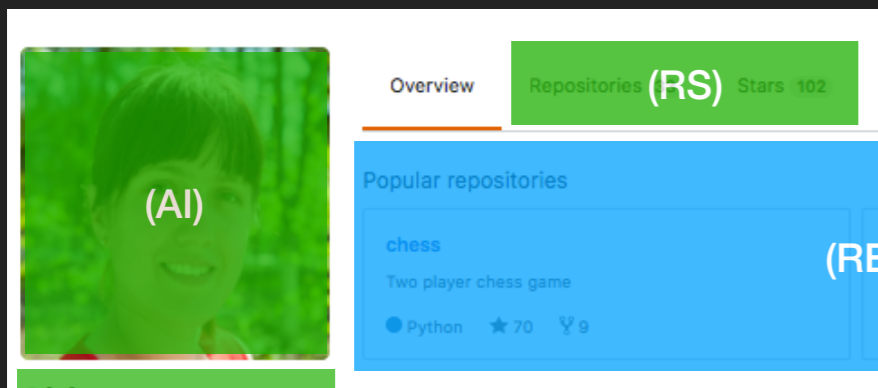
Barriers to Participation

[**Ford**, Smith, Guo, Parnin. FSE 2016]



Mentorship

[**Ford**, Lustig, Banks, Parnin. CHI 2018]




Vision

The Future of Asking

share edit



asked Aug 30 '16 at 20:57

 Abby Jones
1

QUESTION

I think the actual problem may be an off-by-one error for the theoretical max. Calculating it manually gives you $3 * 4 = 12$, which agrees with use of `centralize(normalize=FALSE)`, but the R output from `centralization.degree` seems to be $4 * 5 = 20$. To solve your problem I'd suggest using the following code to normalize it yourself.

```
> newCentralization = function(h) centralize(degree(h),normalize=FALSE)/((vcount(h)-1)*(vcount(h)-2))
> newCentralization(h)
[1] 1

> sessionInfo()
  attached base packages:
[1] stats      graphics  grDevices  utils      datasets  methods   base
[1] igraph_1.0.1
```

ANSWER

answered Sep 2 '16 at 5:18


 Patricia Jones
26 • 2





share edit

Thanks so much Patricia! – Abby Jones Sep 7 '16 at 17:06

BLOG

 A Tale of Two In
Programming La
Between Wealth

FEATURED ON META

-  Sunsetting Docu
-  Should we burni
-  Documentation i
next?

Linked

1935 [How to make a g
example?](#)

Related

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R](#)

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coordinates in the](#)


0 [r and igraph Help
with Weighted Fr](#)

r igraph network-analysis

share edit



asked Aug 30 '16 at 20:57



Abby Jones
1

QUESTION

Women who experience peer parity re-engage sooner.

I think the act manually give output from c the following


```
> newCentral
> newCentral
[1] 1

> sessionInfo()
  attached base packages:
[1] stats      graphics  grDevices  utils      datasets  methods
[1] igraph_1.0.1
```

share edit

ANSWER

answered Sep 2 '16 at 5:18



Patricia Jones
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Related

- 3 Sort and subset r property in R usin
- 5 Changing node/v R
- 5 Using geo-coordi coordinates in the
- 0 r and igraph Help with Weighted Fr

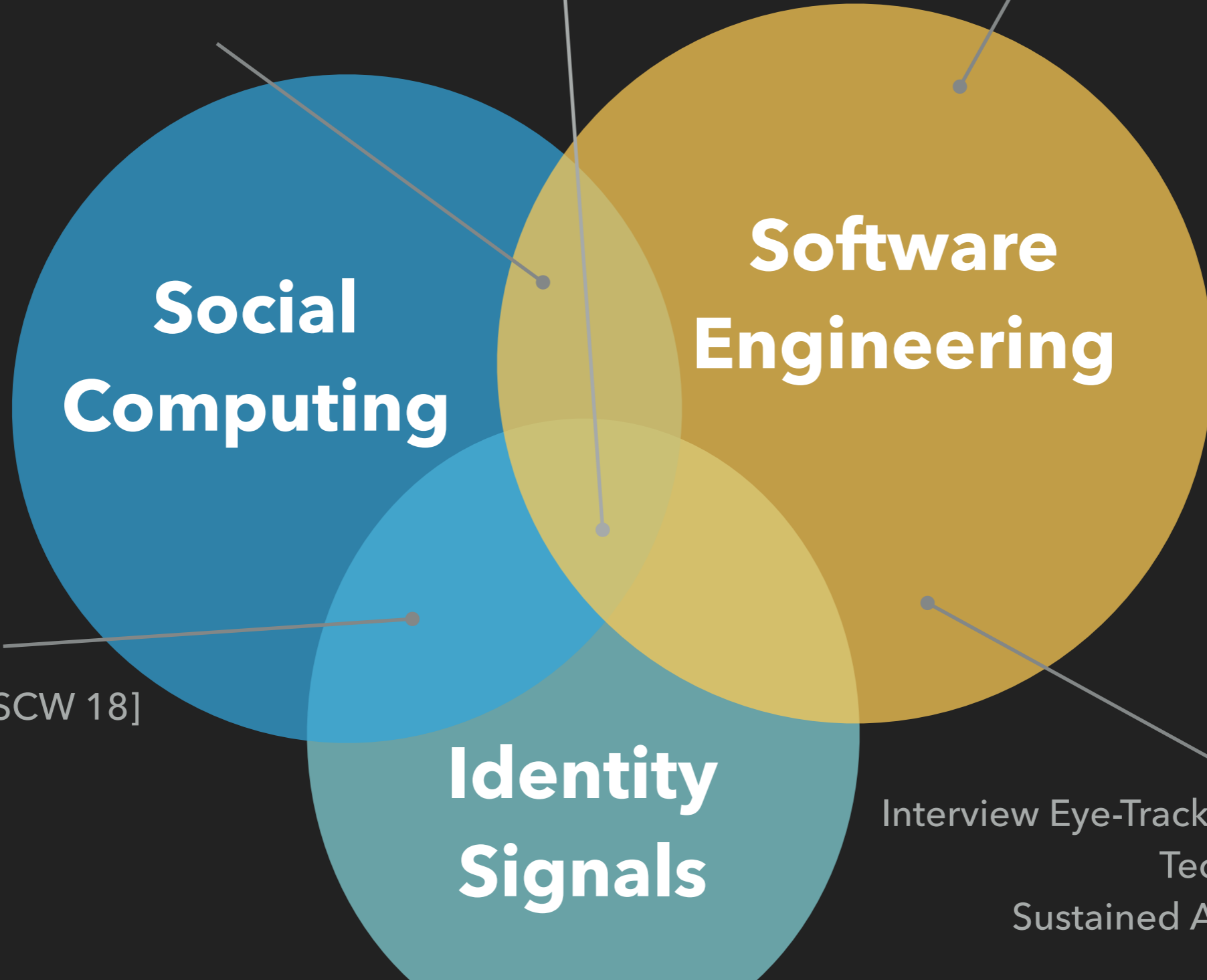


What does asking
for help in the
future look like?

SO Mentorship [CHI 18]
SO Compiler Errors [FSE 18]
SO Barriers [FSE 16]
Frustrated Devs [CHASE 15]

GH Signals [ICSE SEIS 19]
Peer Parity [VLHCC 17]

Characterizing Devs [ESEM 17]
Tool Notifications [FSE 16]



Social Computing

Software Engineering

Identity Signals

Identity Movements [CSCW 18]

Interview Eye-Tracking [ICSE NIER 18]
Tech Talk [CHASE 17]
Sustained Attention [EMIP 15]

SO Mentorship [CHI 18]
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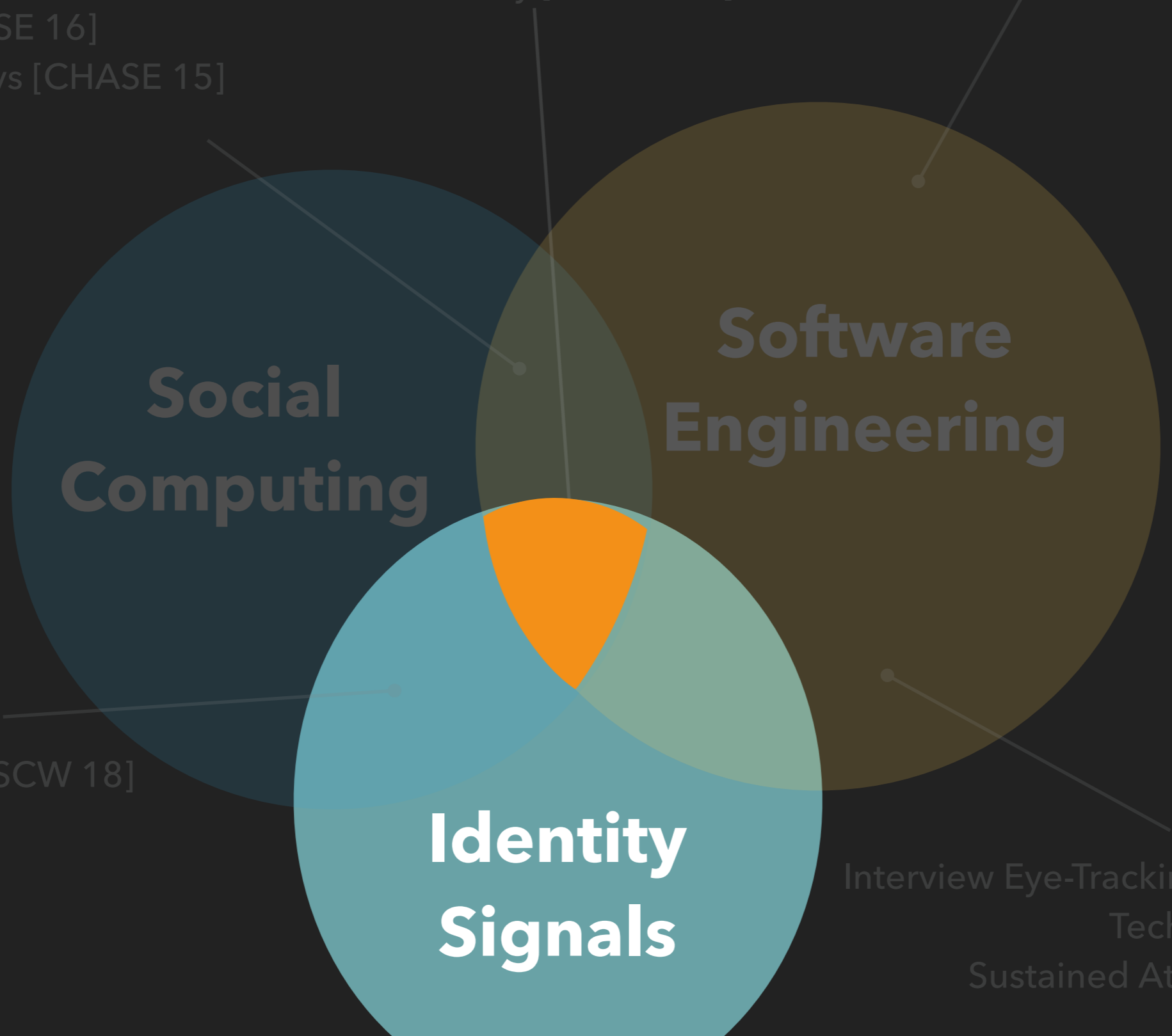
**Social
Computing**

**Software
Engineering**

**Identity
Signals**

Identity
Movements [CSCW 18]

Interview Eye-Tracking [ICSE NIER 18]
Tech Talk [CHASE 17]
Sustained Attention [EMIP 15]



"Software is being developed by increasingly distributed and increasingly diverse groups of individuals."

- Vasilescu

Social
Computing

Engineering

Identity
Signals

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Tool Notifications [FSE 16]

"Software is being developed by increasingly distributed and increasingly diverse groups of individuals."

- Vasilescu

How a programmer's identity is presented will become increasingly influential.

- Ford

1. HOW DO WE USE IDENTITY CUES TO TRUST CODE FROM STRANGERS?

ICMMI 2019 conference@smssi.net via ier-institute.net Sat, Feb 9, 3:23 PM (3 days ago) to me

Why is this message in spam? It is similar to messages that were identified as spam in the past.

Report not spam

Overview **Repositories (RS)** Stars 102

Popular repositories

chess (RE)
Two player chess game
Python ★ 70 ♡ 9

Abby (AI)
Abby (DN)

1,975 contributions in the last year

TicTacToe / TicTacToe

Code Issues 149 Pull requests (PT) Projects 1 Wiki Insights

Add test case to check turn #1158

Open Abby wants to merge 1 commit (TM) TicTacToe:release/2.x from Abby:release/2.x

Conversation 0 Commits 1 Files changed 1

Changes from 1 commit Jump (SD) +28 -0


Add test case to check turn

Abby committed on Feb 9, 2017 (UD)

```
28 src/test/java/org/TicTacToeusage/annotation/MarkerPlacementTest.java
40 /**Test Case to go here**/
41
42
43
44
45
```

```
48 + protected void setUp() {
49 +     cell(2,2) = Player1_filled
Player1_filled:
42 +
43 +
44 +
45 +
```

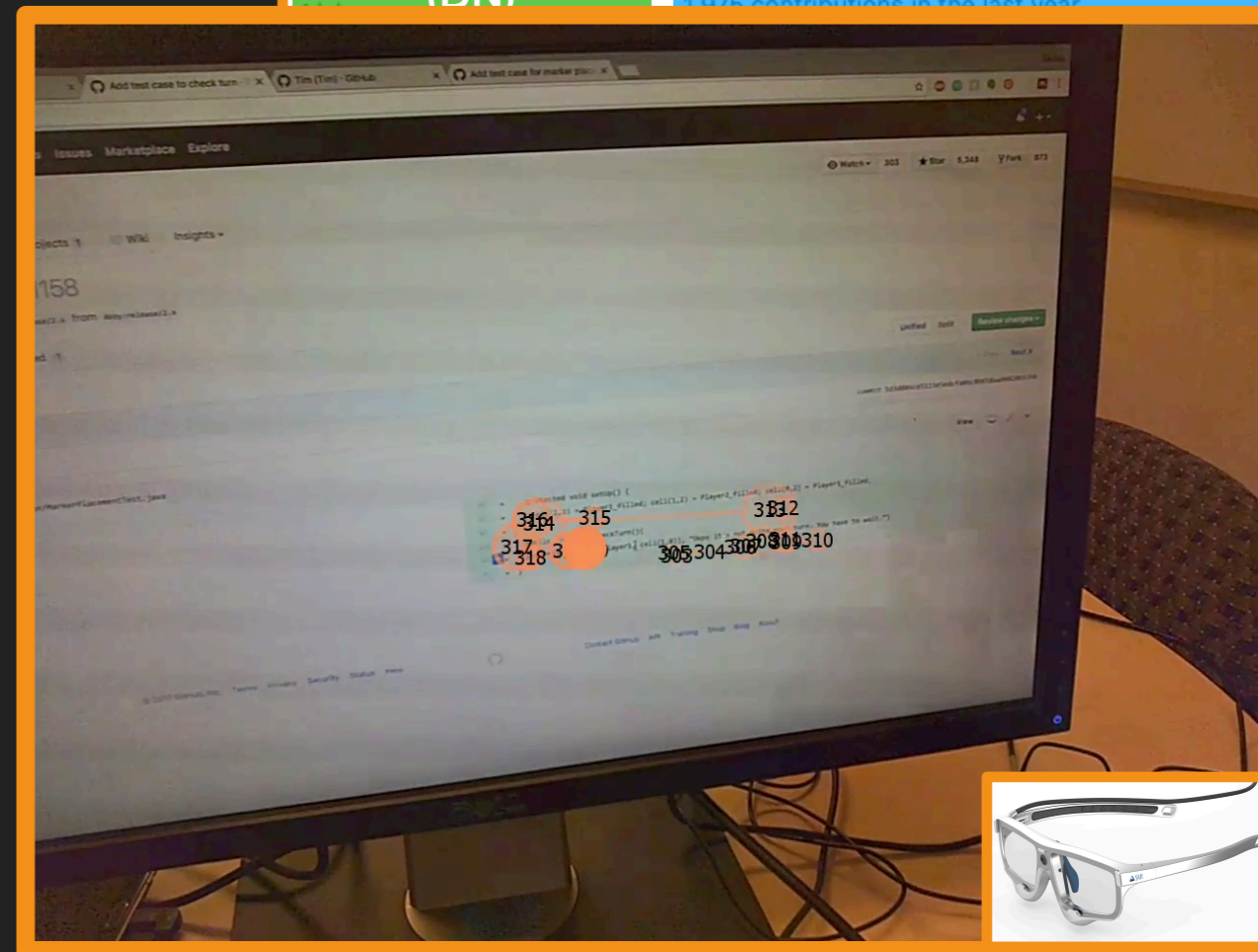
(BC)



1. HOW DO WE USE IDENTITY CUES TO TRUST CODE FROM STRANGERS?



How do signals change based on "code" attributes?



[ICSE SEIS 2019]

2. HOW CAN WE NATURALLY TRANSITION BETWEEN PUBLIC AND PRIVATE HELP SPACES?

How does asking change when audience is specialized?

The screenshot shows a private Stack Overflow team page for 'NC State'. The page header includes the team name, a 'Private team' indicator, and an 'Ask Private Question' button. Below the header, there are navigation tabs for 'Questions', 'Tags', 'Users', and 'Settings', along with a 'Return to Stack Overflow' link. The main content area displays a list of questions:

- Integrating Selenium and Cucumber**: 3 votes, 1 answer, 144 views. Tags: selenium, onboard-project, cucumber. Asked Sep 9 '18 at 0:00 by Neil Dey (23 ● 2). A green 'CLOSE FRIENDS' button is visible below the question.
- Jenkins initial build yellow ball**: 4 votes, 1 answer, 236 views. Tags:itrust2, jenkins. Asked Sep 27 '18 at 17:56 by Nicholas Ducret (21 ● 2).
- Ansible/executor Baker errors**: 2 votes, 0 answers. Description: Whenever I try to run baker bake on the Ansible and Executor baker.yml files, I am continuously running into the same error for both. I am not sure where to start debugging. Here is the last part of ...

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How does *segmented* anonymity become more helpful in these spaces?

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- Integrating Selenium and Cucumber**: 3 votes, 1 answer, 144 views. The question text is partially visible: "I am attempting to test the edit recipe functionality using cucumber and selenium, and have run into a myriad of problems doing so. The basic structure of my test is currently as such: public class ...". It has tags for 'selenium', 'onboard-project', and 'cucumber'. The asker is Neil Dey, asked Sep 9 '18 at 0:00. A red box highlights the 'CLOSE FRIENDS' dropdown menu.
- Jenkins initial build yellow ball**: 4 votes, 1 answer, 236 views. The question text is partially visible: "I compiled the project in Jenkins to ensure the main & development branches were passing. They passed every test except 3 (listed below) All three of these tests fail when they reach the line (in ...". It has tags for 'itrust2' and 'jenkins'. The asker is Nicholas Ducret, asked Sep 27 '18 at 17:56.
- Ansible/executor Baker errors**: 2 votes, 0 answers. The question text is partially visible: "Whenever I try to run baker bake on the Ansible and Executor baker.yml files, I am continuously running into the same error for both. I am not sure where to start debugging. Here is the last part of ...".

The left sidebar contains navigation links: 'Questions', 'Tags', 'Users', 'Settings', and 'Return to Stack Overflow'.

2. HOW CAN WE NATURALLY TRANSITION BETWEEN PUBLIC AND PRIVATE HELP SPACES?

How does asking change when audience is specialized?

How does *segmented* anonymity become more helpful in these spaces?

How do we manage context collapse across platform?

The collage consists of three screenshots:

- Top-left:** A GitHub profile for Gregor Martynus (@gr2m). It shows a 'Pinned / Top repositories' section with items like 'octokit/rest.js', 'nock/nock', 'semantic-release/semantic-release', 'offlinefirst/offlinefirst.org', and 'hoodiehq/hoodie'. A 'Follow' button is visible at the bottom.
- Top-right:** A Facebook profile for Jess Frazelle (jessfraz). The profile picture shows a smiling woman. Below the name, there is a 'Busy' status and a 'CLOSE FRIENDS' privacy setting. A text overlay says 'call me on my shell phone'. A 'Follow' button is at the bottom.
- Bottom:** A Facebook post by Krystal from January 31 at 4:58 PM. The text of the post is 'What enterprise JAVA sdks are people using now?'. Below the text are 'Like' and 'Comment' buttons, and a text input field for a comment.

3. HOW DO WE EMPOWER MARGINALIZED PROGRAMMERS IN VIRTUAL TECH SPACES?



#ILookLikeAnEngineer

[CSCW 2018]

3. HOW DO WE EMPOWER MARGINALIZED PROGRAMMERS IN VIRTUAL TECH SPACES?



Where are they seeking technical help?

[CSCW 2018]

3. HOW DO WE EMPOWER MARGINALIZED PROGRAMMERS IN VIRTUAL TECH SPACES?



[CSCW 2018]

AskQuestions.Tech

[About](#) [FAQ](#) [Terms of Service](#) [Privacy](#)

About AskQuestions.Tech

The inclusive place to ask tech questions.

Studio Community

Always Be Civil

Nothing sabotages a healthy conversation like rudeness:

[Get live help!](#) These Python Tutor users are asking for help right now. Please volunteer to help!

[Start private chat](#)

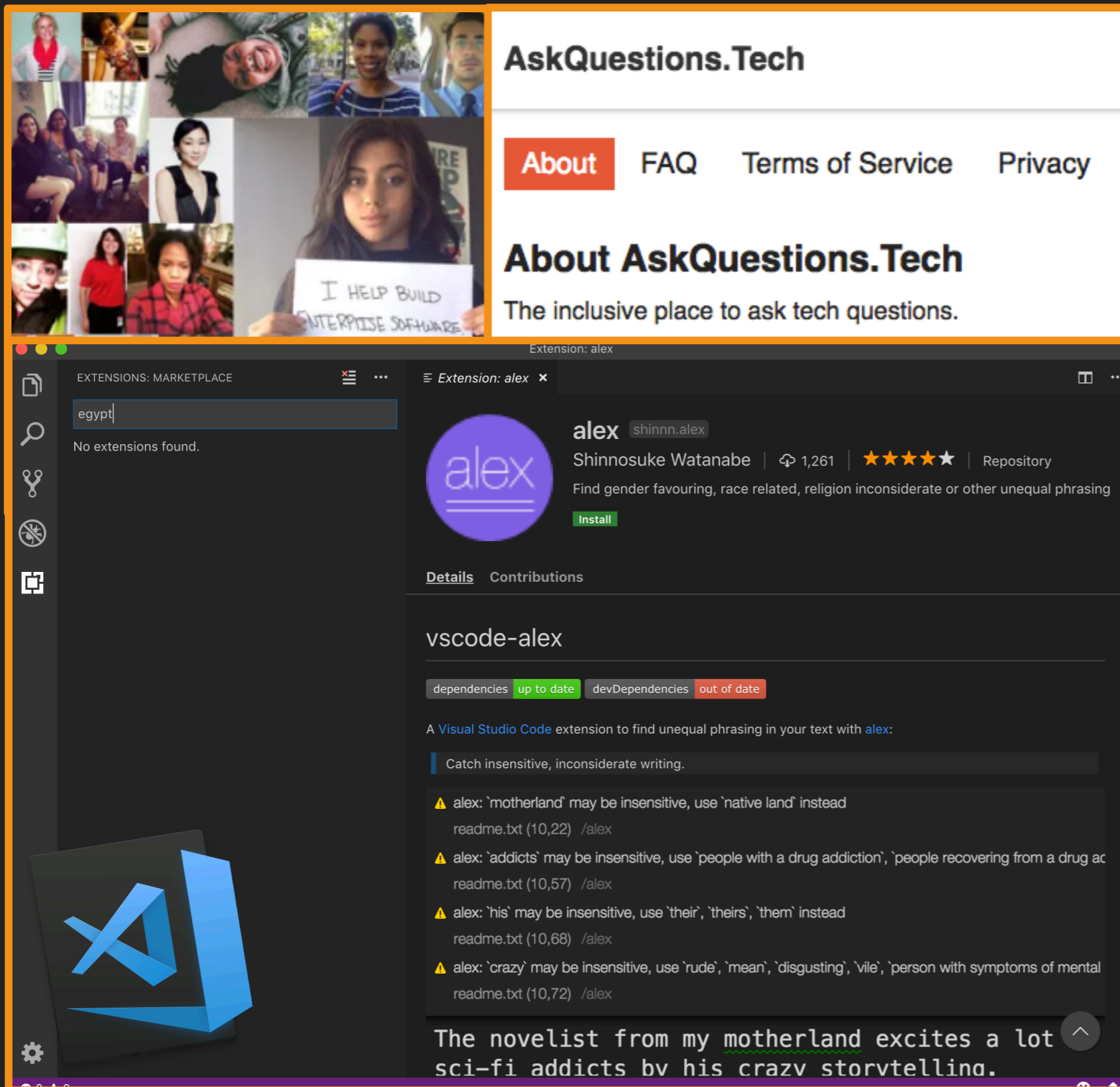
[How do I use this?](#)

- user_ae5 from Denver, Colorado, US needs help with Python3 - 2 people chatting - [click to help](#)
- user_3b9 from Valencia, Spain needs help with Python3 - 2 people chatting - [click to help](#) (active)
- user_38b from Youngstown, Ohio, US needs help with Python3 - 2 people chatting - [click to help](#)
- user_794 from Charlotte, North Carolina, US needs help with Python3 - [click to help](#) (IDLE: last active 11 minutes)
- user_856 from Lorton, Virginia, US needs help with Python3 - [click to help](#) (IDLE: last active 11 minutes)

Where are they seeking technical help?

How can we make our communities more like those spaces?

3. HOW DO WE EMPOWER MARGINALIZED PROGRAMMERS IN VIRTUAL TECH SPACES?



The image shows two screenshots. The top one is the AskQuestions.Tech website, which features a grid of diverse people's faces on the left and navigation links like 'About', 'FAQ', 'Terms of Service', and 'Privacy' on the right. Below the navigation is the text 'About AskQuestions.Tech' and 'The inclusive place to ask tech questions.' The bottom screenshot is from the VS Code extension marketplace, showing the 'alex' extension by Shinnosuke Watanabe. The extension's description is 'Find gender favouring, race related, religion inconsiderate or other unequal phrasing'. It has a 5-star rating and 1,261 installations. The extension is shown detecting insensitive language in a text file, such as 'motherland', 'addicts', 'his', and 'crazy', and suggesting more inclusive alternatives.

Where are they seeking technical help?

How can we make our communities more like those spaces?

How can we encourage programmers to build these types of platforms?

SUMMARY

Online Q&A communities are widely used, but present barriers of **unfamiliar norms** can leave programmers, specifically novices and women discouraged from participating.

[FSE 2016]

Just-in-time mentoring provided novices with help to ask a well-received question, precisely when they needed it.

[CHI 2018]

Vision: How can we empower, connect, and give control back to the users by constructing participation around **identity signals** ?

http://denaeford.me

denae_ford@ncsu.edu

Would you like an experienced Stack Overflow user to help refine your question before you post it? They're here to help!

No, just post my question

Yes, join mentorship chat

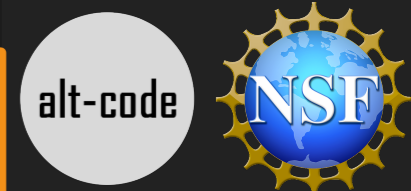
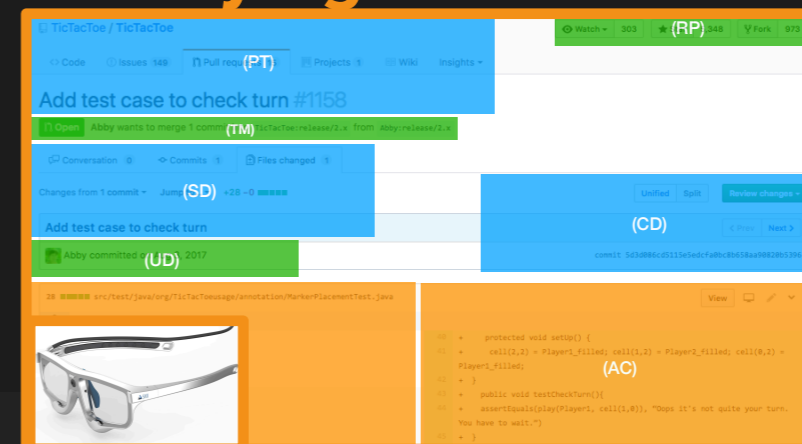
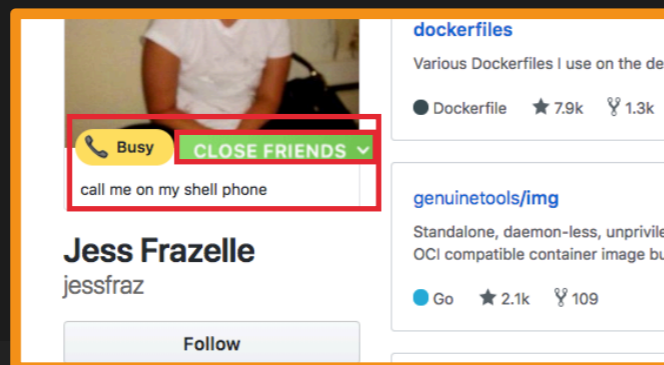
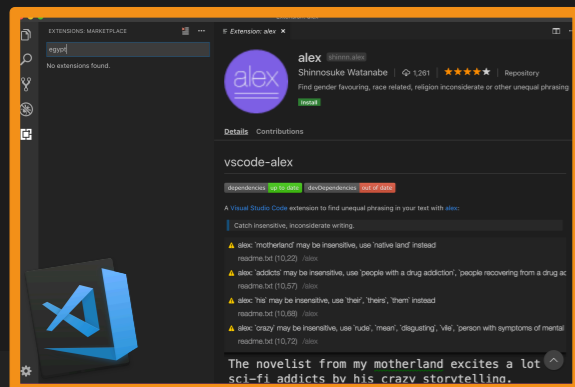
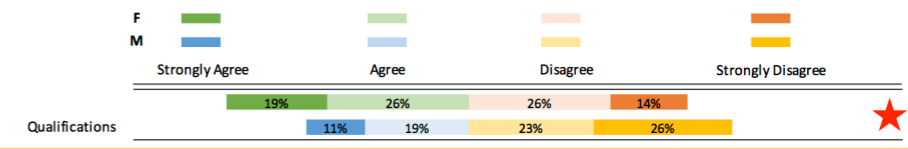
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Vision: How can we empower, connect, and give control back to the users by constructing participation around **identity signals** ?





An Online Programming Community (OPC) is.....

Any virtual space where people come together with others to converse, exchange information or other resources, learn, play or just be with each other in the context of programming

[derived from Kraut 2012]

An ecosystem due to many types of members, how their actions can effect each other, and how they develop niches.

[Herbsleb 2014]

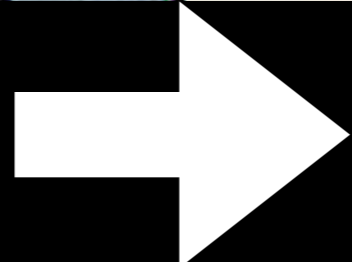
Benefits include the ability to learn more about programming while contributing to the code of others.

[Stack Overflow 2016, Zlotnick 2017]





TARGET A FEW



HELP MANY



BARRIERS BY FACTORS

Wilcoxon Rank Sum Test

$\alpha = .05$; $\alpha = 0.0012$ with Bonferroni Correction

ACCOUNT ACTIVITY

HAS ACCOUNTS VS. NOT

(n = 1003, n = 467)

Awareness of Features

Stranger Discomfort

Intimidating Community Size

Fear of Contributing to the Clutter

Posting is Hard, Friends are Easy

Qualifications

Onboarding Hoops

EXPERIENCE

FULL TIME DEV VS. NOT

(n = 1003, n = 467)

Qualifications

Time Constraints

Paired Guidance



Mellie

Why aren't my arrays showing updates?

tags: javascript

Hello, can you please help?

```
if (x) {  
    print ("hello world!")  
};
```

[edit](#) [copy draft back to Stack Overflow](#)

Hey @Mellie , thanks for coming. :) This is the Stack Overflow chat room we're using to help people improve their questions. This message is automated but everything else is real! Before we start: do you have any particular concerns, or are you just double-checking before you post?

Olivia



Hey there @Mellie ! I'm here to help you with your question. Gimme a sec while I read over it.

Mentor-mentee pairing based on peer identification

Why Stack Overflow?

Alternatives exist (AllAnswered, Software Engineering Stack Exchange, Hacker News, Twitter, r/programming) but lack the following:

- Popularity with **8,338,956 users**
- Public access to data
- Accessibility to answers
- Breath of topics



Why GitHub?

The image shows a GitHub profile page with several green boxes highlighting key elements: 'Profile Image', 'Name', 'Location', 'Overview', 'Repositories 33', 'Stars 102', 'Following', 'chess', 'hangman', and '1,975 contributions in the last year'. The 'chess' repository is described as a 'Two player chess game' in Python with 70 stars and 9 forks. The 'hangman' repository is a 'Multiplayer game of hangman' in C# with 21 stars and 3 forks. A contribution graph shows activity from August to July, with a legend indicating 'Less' and 'More' contributions.

A Github account is the calling card of the software developer.

Just as any writer would be asked to show their blog, every developer is expected to produce examples of their code on Github.

In 2017, the GitHub community reached **24 million** users working across **67 million repositories**.



Likert Statement	Median
I feel that I am a part of the Stack Overflow community.	4
I feel more comfortable posting on Stack Overflow.	4
The help that I received from this program was useful to me.	5
I would recommend this program to other SO users.	5
I would like to participate in this program again.	5

"If we can get the [original poster] through the first question with a positive experience and they can see how this site really works, then we should get more good questions which feeds in to having more good answers." (Mentor)

**NOVICES SATISFIED
WITH THEIR EXPERIENCE**

**MENTORS INTERESTED
IN OFFERING GUIDANCE**

ON-RAMP ROADBLOCKS

Abstraction Process

Time Constraints

Qualifications

Onboarding Hoops

Research Pressure

IMPERSONAL INTERACTIONS

Fear of Negative Feedback

Stranger Discomfort

Intimidating Community Size

Posting Is Hard, Friends Are
Easy

MUDDY LENS PERSPECTIVE

Awareness of Site Features

Nothing Left To Answer

Fear of Contributing to Clutter

No "Good-Answer" Guarantee

Perception of Slacking