A person is shown from behind, sitting at a desk in a dimly lit room. They are wearing a dark blue shirt. Their right hand is on their head, and their left hand is holding a smartphone. In front of them are two computer monitors. To the right, a book is open on a shelf. The person appears to be in a state of frustration or deep thought. The title text is overlaid on the image in a large, white, sans-serif font.

# StackOverflow and GitHub: Associations Between Software Development and Crowdsourced Knowledge

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# Standing on the shoulders of others

Developers:

- reuse components and libraries
- forage on the Web for information



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## How do I edit an incorrect commit message in Git?

3554

I stupidly did a Git commit while half asleep, and wrote the totally wrong thing in the commit message. How do I change the commit message?

I have not yet pushed the commit to anyone.



1020

[git](#) [version-control](#) [commit](#) [rebase](#) [git-rewrite-history](#)

[share](#) | [edit](#) | [flag](#)

edited Apr 25 at 20:04



[Roberto Tyley](#)  
2,296 ● 1 ● 14 ● 33

asked Oct 7 '08 at 15:44



[Laurie Young](#)  
24.5k ● 7 ● 26 ● 41

**532** For those somewhat new to git: Laurie's point about having not yet pushed is important. Like rebasing, this is changing the history. If someone has cloned/pulled from your repo between the original and

### 20 Answers

[active](#)

[oldest](#)

[votes](#)

3858



+50

```
git commit --amend -m "New commit message"
```

Used to amend the tip of the current branch. Prepare the tree object you would want to replace the latest commit as usual (this includes the usual `-i/-o` and explicit paths), and the commit log editor is seeded with the commit message from the tip of the current branch. The commit you create replaces the current tip -- if it was a merge, it will have the parents of the current tip as parents -- so the current top commit is discarded.

It is a rough equivalent for:

```
$ git reset --soft HEAD^
$ ... do something else to come up with the right tree ...
$ git commit -c ORIG_HEAD
```

but can be used to amend a merge commit.

[share](#) | [edit](#) | [flag](#)

edited Mar 17 '12 at 1:25



[Alex Lockwood](#)  
22.7k ● 9 ● 55 ● 87

answered Oct 7 '08 at 15:50



[EForEffort](#)  
42.6k ● 3 ● 15 ● 30

1048

```
git commit --amend -m "your new message"
```

[share](#) | [edit](#) | [flag](#)

edited Jan 11 '11 at 10:33



[dbr](#)  
55.3k ● 23 ● 147 ● 228

answered Feb 8 '10 at 4:26



[lfx\\_cool](#)  
10.5k ● 1 ● 5 ● 2

tagged

[git](#) × 30882

[version-control](#) × 8369

[commit](#) × 1198

[rebase](#) × 436

[git-rewrite-history](#) × 29

asked **4 years ago**

viewed **504432 times**

active **today**

Linked

0 [How do I edit an incorrect commit message in git](#)

0 [changing git comment of a pushed commit](#)

0 [changing the commit message in git](#)

-1 [git: How to change the commit message of an already committed file, non interactively?](#)

1 [Is there any way to change commit message for a specific commit in git?](#)

3 [Change the wrong commit message in Git](#)

0 [Making a Class](#)

# Writing code vs. seeking and sharing knowledge

Demand for knowledge



Supply of knowledge

Is participation in SO related to  
productivity of developers?



# Is participation in SO related to productivity of developers?

## Beneficial:

- good technical solutions

[Parnin et al. “*Crowd documentation: Exploring the coverage and the dynamics of API discussions on Stack Overflow*,” Georgia Institute of Technology, Tech. Rep., 2012]

- fast answers (median 11 mins)

[Mamykina et al. “*Design lessons from the fastest Q&A site in the west*,” in CHI. ACM, 2011, pp. 2857–2866]





# Is participation in SO related to productivity of developers?

## Detrimental:

- competes for time

[Storey et al. “*The impact of social media on software engineering practices and tools*,” FoSER. ACM, 2010, pp. 359–364]

- gamified, thus addictive

[Deterding, “*Gamification: designing for motivation*,” Interactions, vol. 19, no. 4, pp. 14–17, 2012]

- context switches are expensive

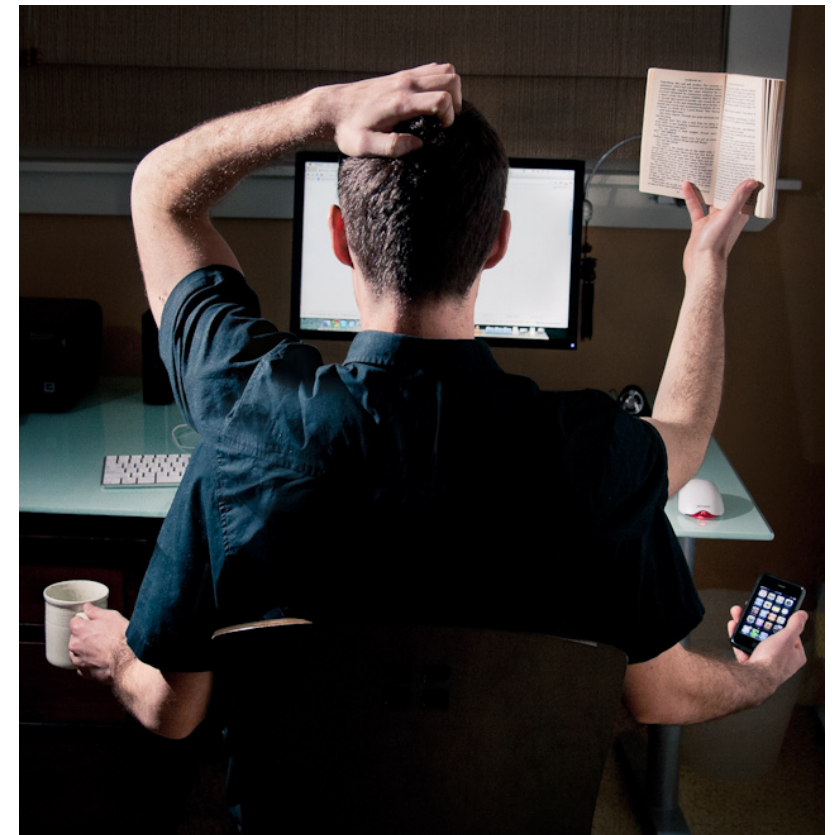
[Bacchelli et al. “*Harnessing Stack Overflow for the IDE*,” in RSSE. IEEE, 2012, pp. 26–30]



# Is participation in SO related to productivity of developers?



Asset  
or  
burden?



# Dataset

Largest code host  
in the world



Largest programming  
Q&A site in the world

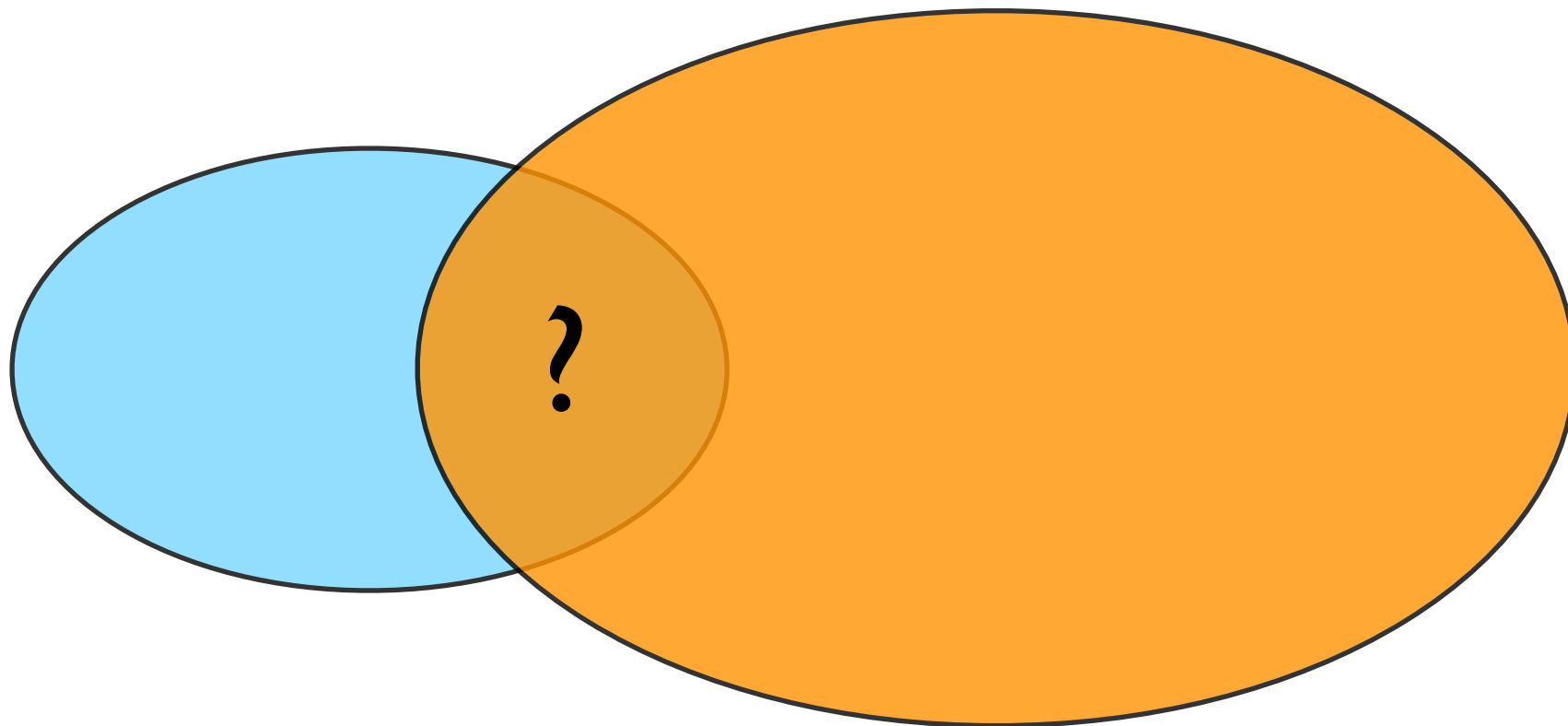


~400k users  
July 2011 - April 2012

~1.3M users  
July 2008 - August 2012



# Dataset



July 2011 - April 2012

July 2008 - August 2012

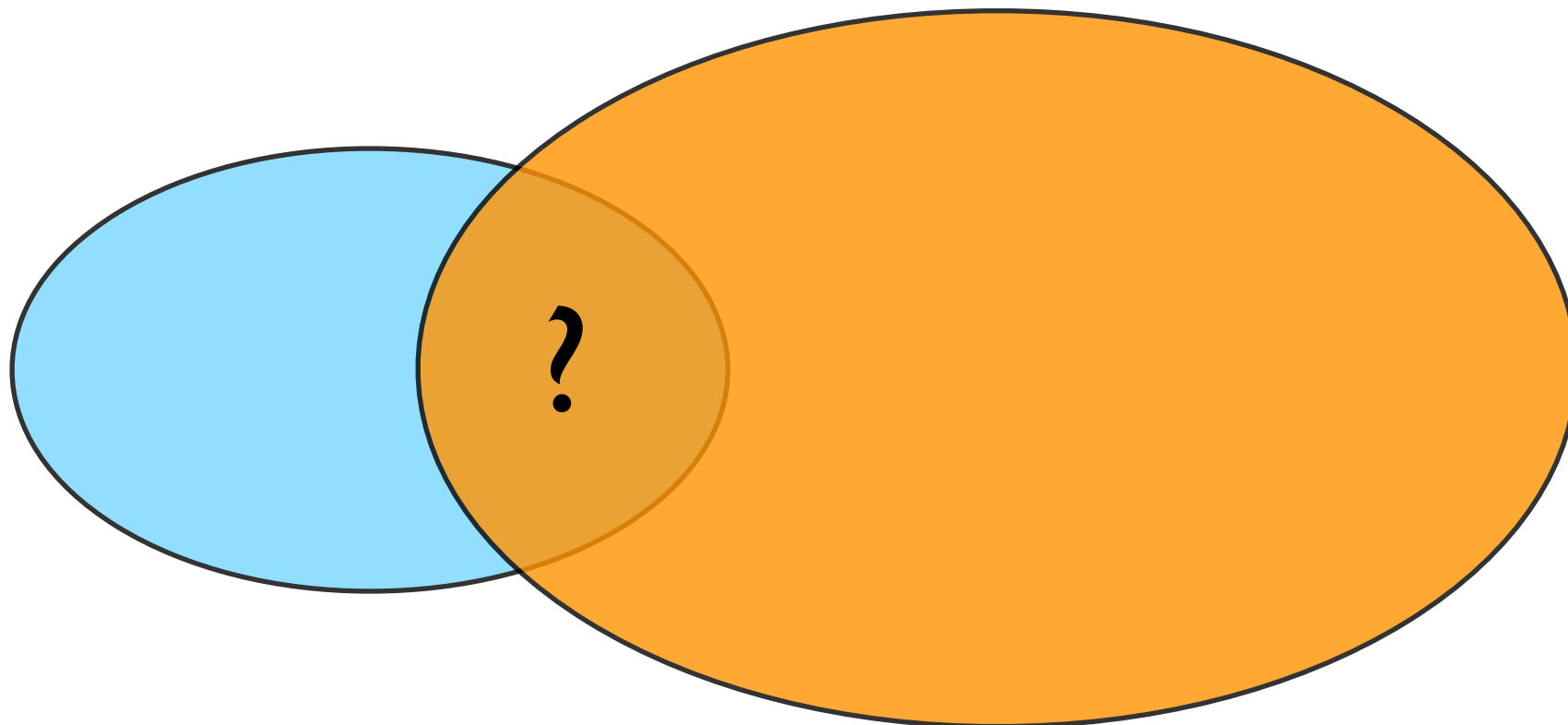
# Dataset



Email address (plain text)



Email address (MD5 hash)



July 2011 - April 2012

July 2008 - August 2012

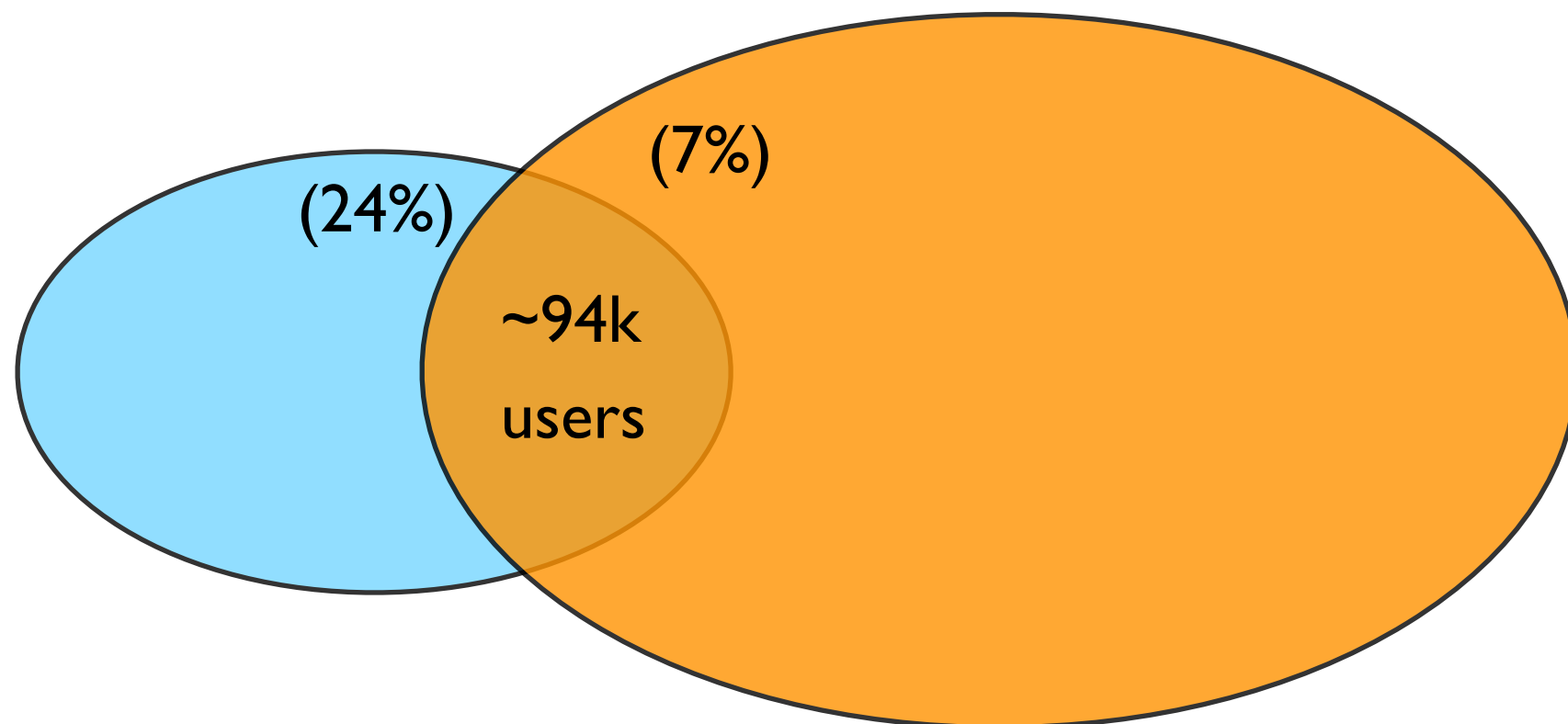
# Dataset



Email address (plain text)



Email address (MD5 hash)



July 2011 - April 2012

July 2008 - August 2012



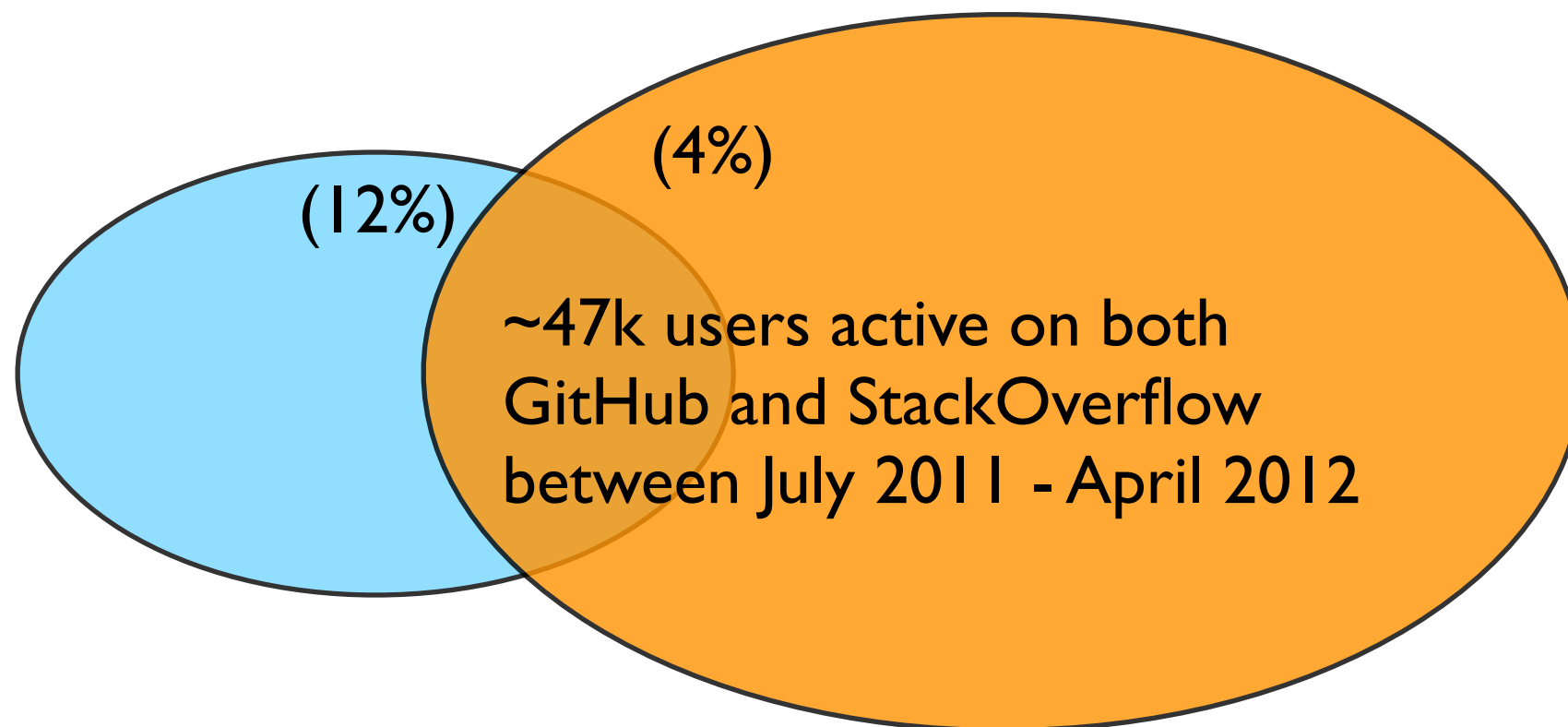
# Dataset



Email address (plain text)



Email address (MD5 hash)



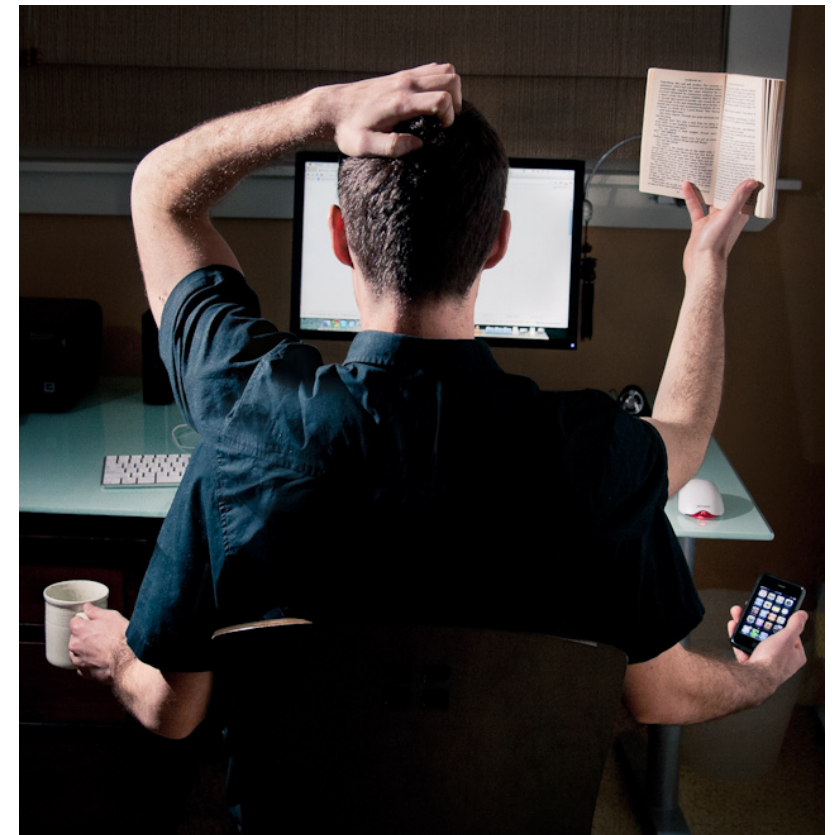
July 2011 - April 2012

July 2008 - August 2012

# Is participation in SO related to productivity of developers?



Asset  
or  
burden?



# Macro: overall activity levels



To what extent can activity (expertise) on one platform be used as a **proxy** for activity (expertise) on the other?

- social signals (e.g., open source projects, professional social media) ~ career advancement



# Intermediate: working rhythms



Is attention **focused** (bursts of commits) or **divided** between the two platforms?

- working rhythms of developers ~ software quality

[Eyolfson et al. "Correlations between bugginess and time-based commit characteristics,"  
Empirical Software Engineering, pp. 1–31, 2013]

# Micro: coordination between commits and Q&A



Do StackOverflow activities **accelerate** or  
**slow down** GitHub commits?

[Storey et al. “*The impact of social media on software engineering practices and tools*,” FoSER. ACM, 2010, pp. 359–364]



# Macro




## Overall activity



#Commits

#Questions

#Answers

 Dave	100	5	50
 Stuart	10	75	15
 Kevin	25	10	75





# Macro




## Overall activity



#Commits

#Questions

#Answers

 Dave	100	5	50
 Kevin	25	10	75
 Stuart	10	75	15



# Macro

## Overall activity

Fix, sort

Quartiles/Deciles, compare



#Commits



#Questions

#Answers



Dave

100

5

50



Kevin

25

10

75



Stuart

10

75

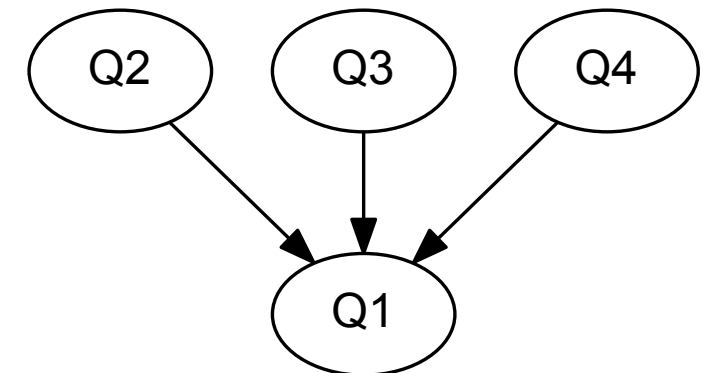
15

Not restricted to monotonic relations!

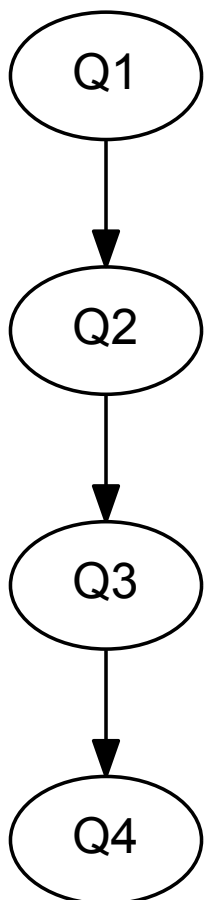


# Findings

- Active GitHub committers are experienced developers:
- few StackOverflow questions
- many StackOverflow answers



Quartiles (#Commits)  
Compare #Questions



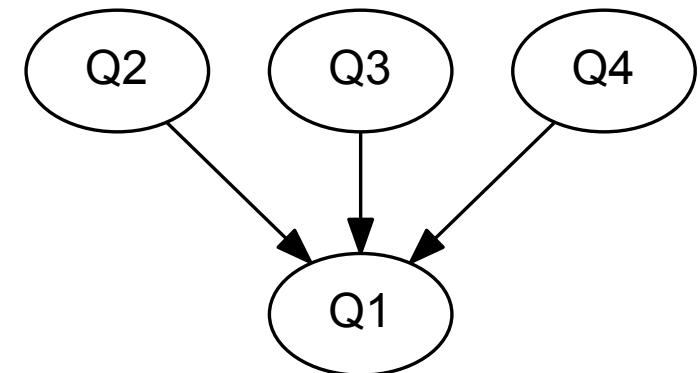
Quartiles (#Commits)  
Compare #Answers



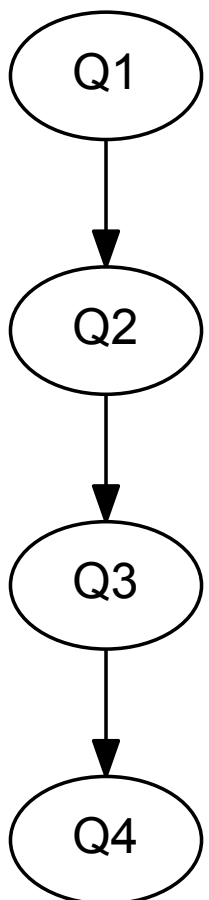
# Findings

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➡ Top StackOverflow users are **superstars** rather than **slackers**!



Quartiles (#Commits)  
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Quartiles (#Commits)  
Compare #Answers



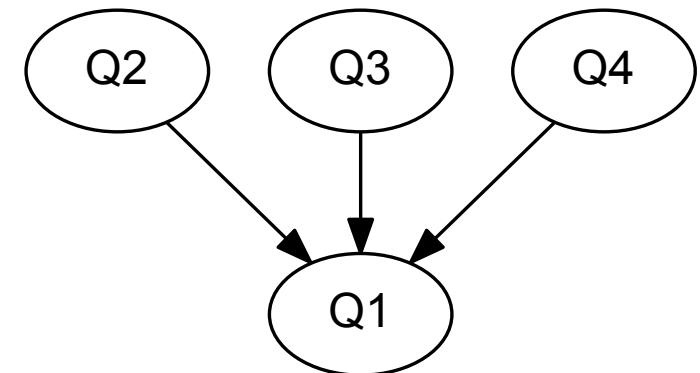


# Findings

- Active GitHub committers are experienced developers.

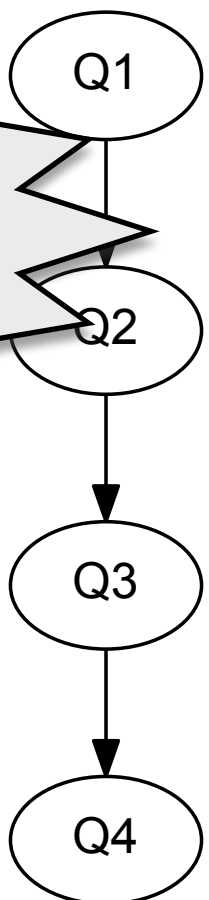
GitHub activity ~  
StackOverflow willingness to answer  
technical questions (expertise)

Top StackOverflow users are  
**superstars** rather than **slackers**!



Quartiles (#Commits)

Questions



Quartiles (#Commits)

Compare #Answers



# Intermediate

## Working rhythms

Committing rhythm: series of inter-commit time intervals

[Xuan et al. "Measuring the effect of social communications on individual working rhythms: A case study of open source software," in Social Informatics. ASE/IEEE, 2012]




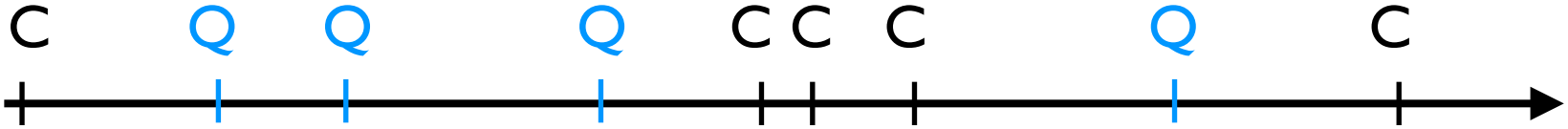
Gini (Committing rhythms): focused vs. distributed attention



Gini (Committing rhythms)

#Q

#A

		5	50
		75	15



# Findings

- **Asking** questions on StackOverflow influences how developers distribute their GitHub commits:
  - ▶ heavy askers: bursts of intense commit activity followed by longer periods of inactivity (focused attention)



# Findings

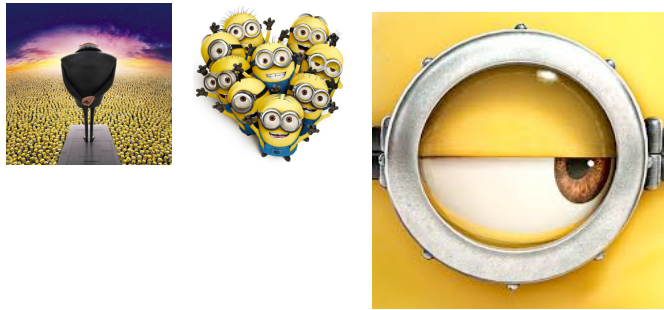
- **Asking** questions on StackOverflow

influence their

Learning from  
StackOverflow (by asking) and  
committing to GitHub

activity of  
inactivity (focused attention)



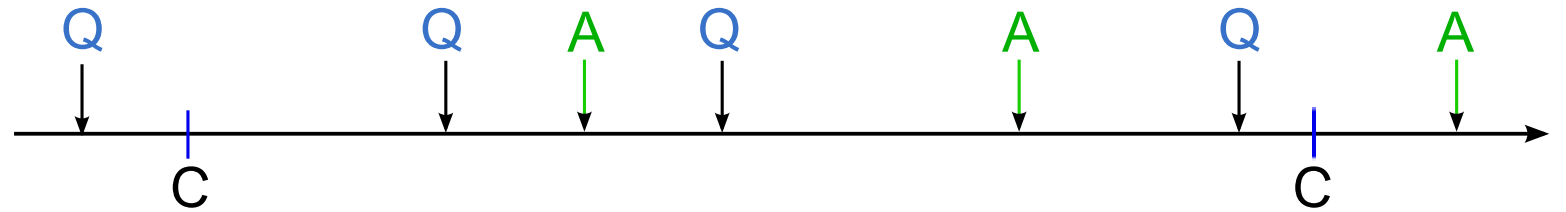


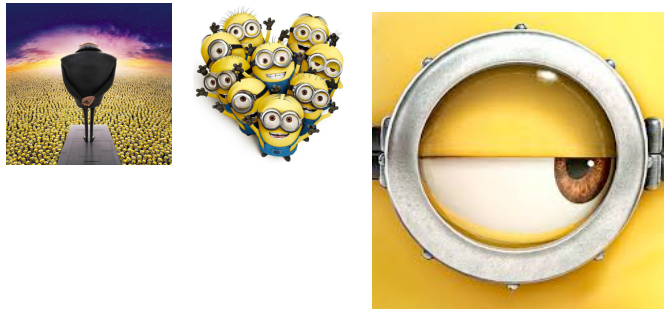
# Micro

Who benefits from participating in SO



Dave



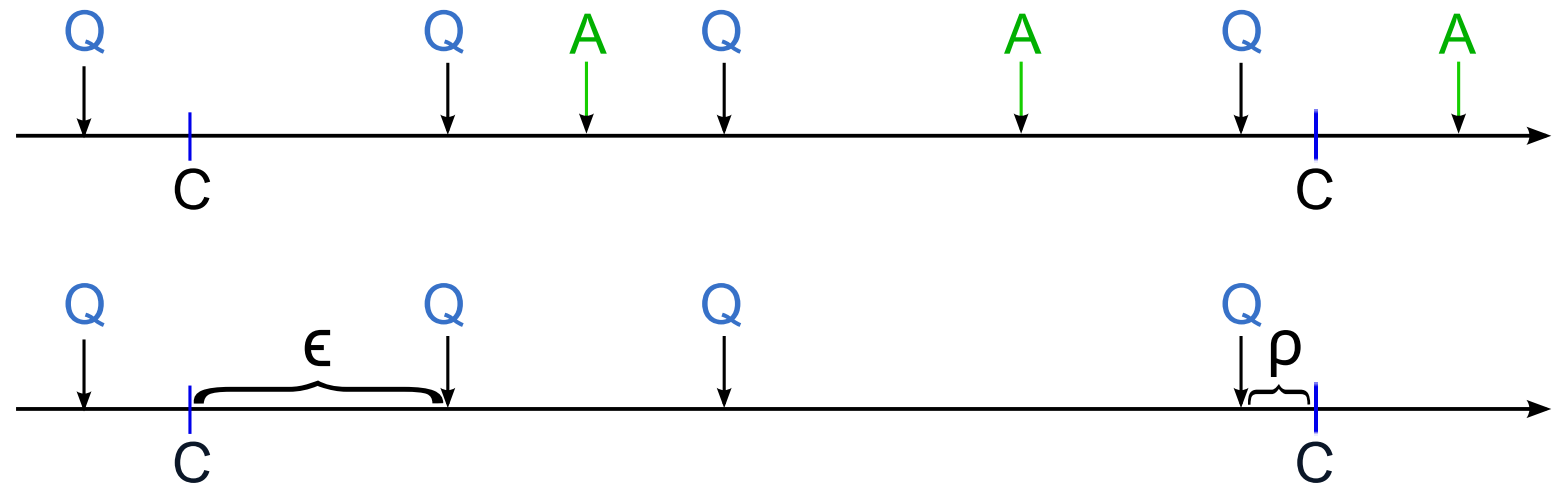


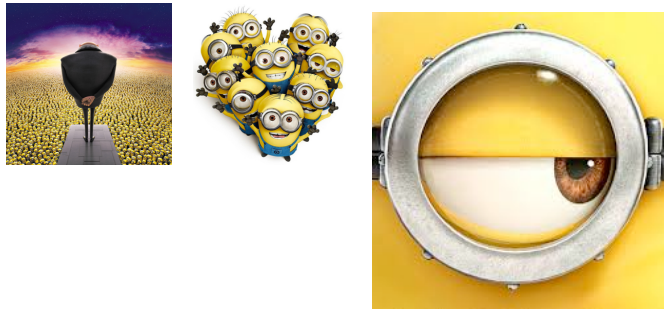
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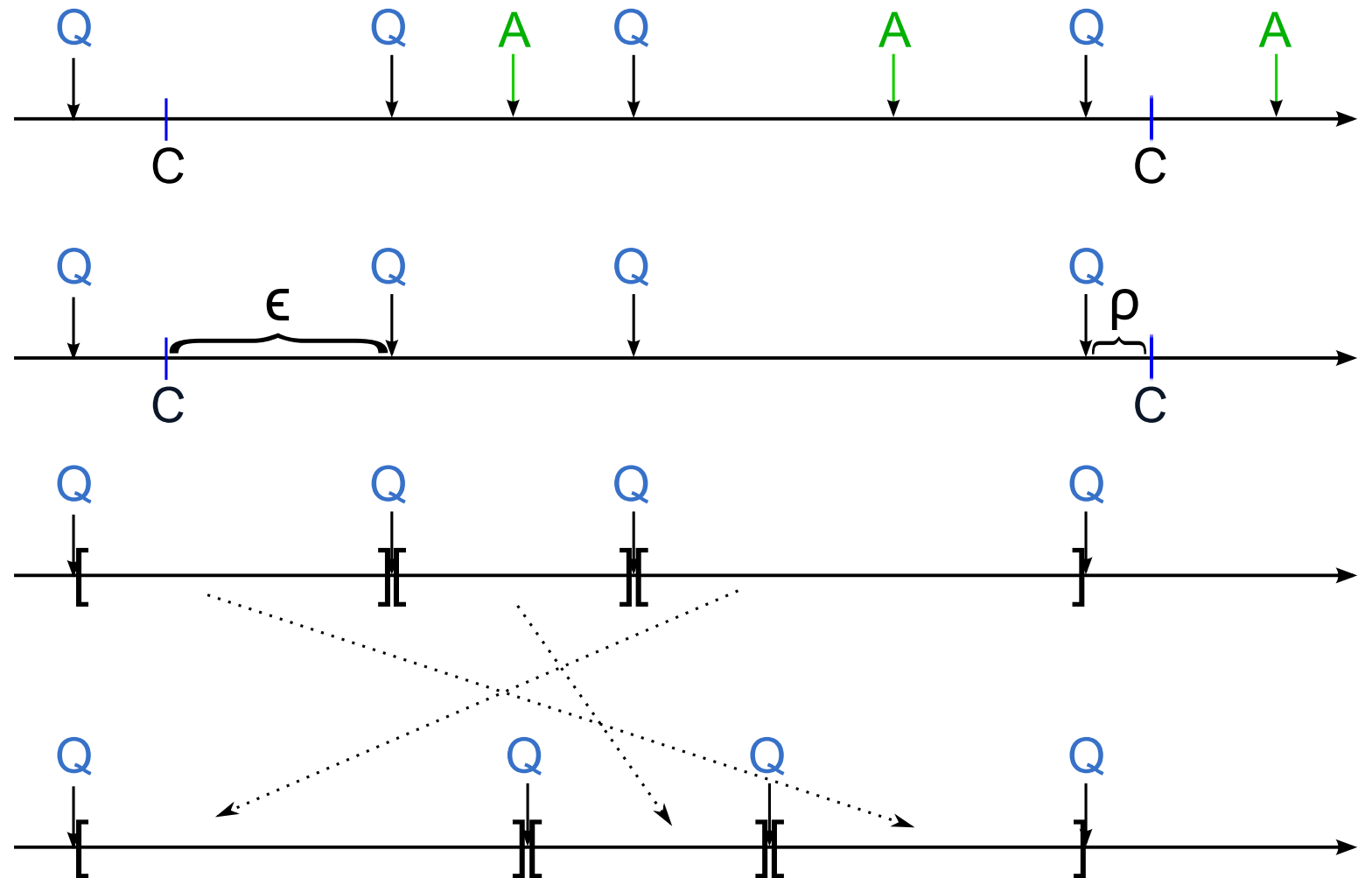


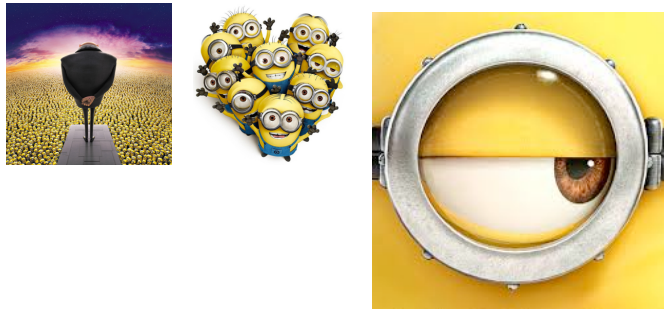
# Micro

Who benefits from participating in SO



Dave





# Micro

Who benefits from participating in SO

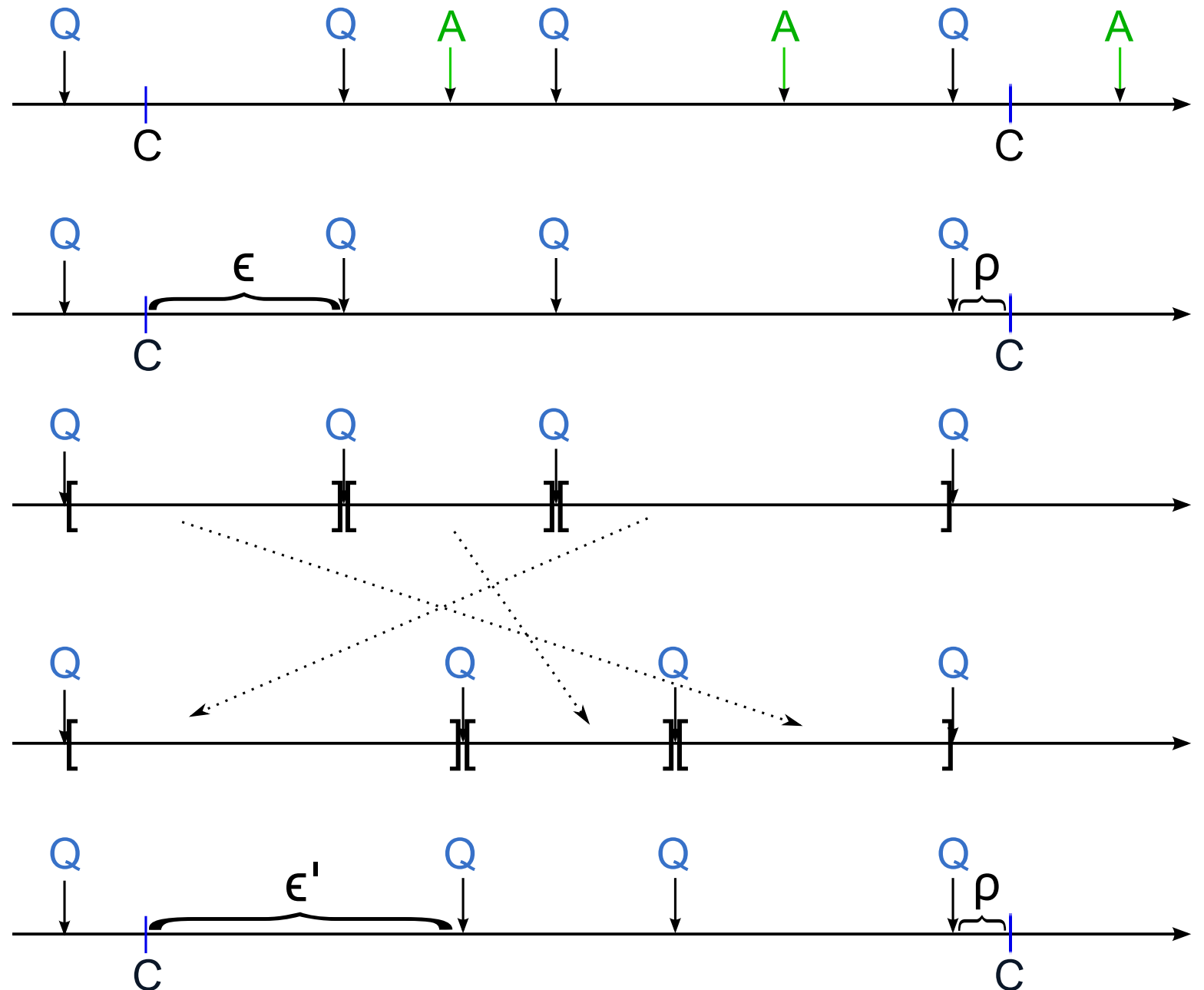


Dave

Compare actual and shuffled series:

actual < shuffled:  
acceleration

actual > shuffled:  
impediment







# Findings



# Findings

For active committers, asking and answering questions on StackOverflow catalyses committing on GitHub.

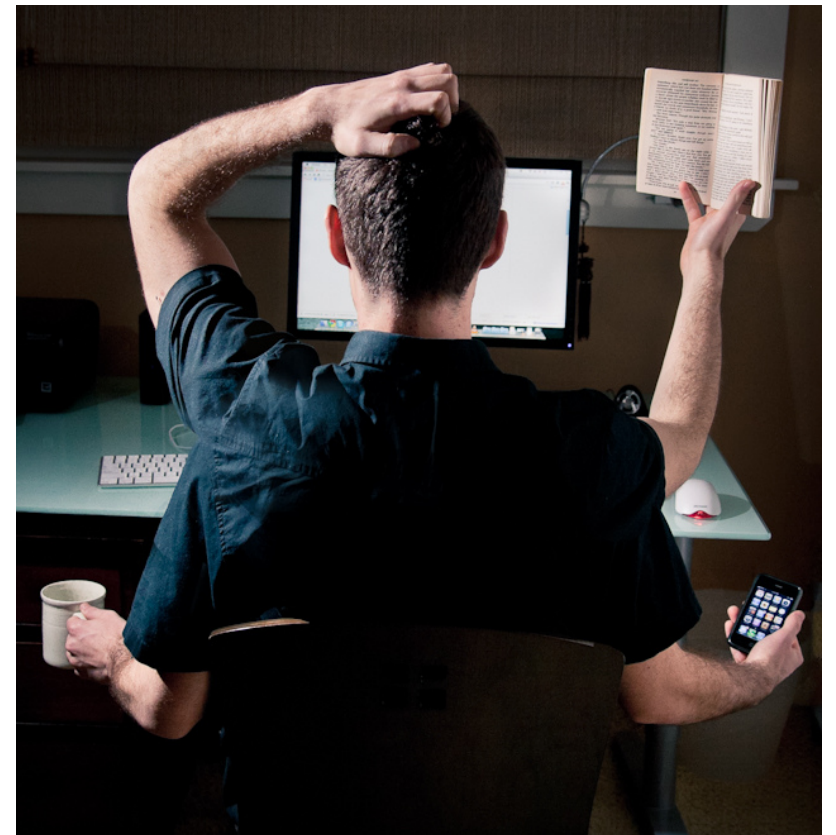
For no group is participating in StackOverflow detrimental!

# Summary:

## Is participation in SO related to productivity of GitHub dev's?





Asset  
or  
burden?



# Summary



Active  **github** SOCIAL CODING committers are also active answerers (knowledge providers) on  **stackoverflow**



Different working rhythms for novices (focused attention) and experts



Participating in  **stackoverflow** reinforces commit activities on  **github** SOCIAL CODING

Experts are experts  
everywhere!



 **stackoverflow**  
is "costlier" for  
novices

 **stackoverflow**  
asset or burden



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Experts are experts everywhere!

 **stackoverflow** is "costlier" for novices

 **stackoverflow** asset or burden