

Profiling Cryptography Developers

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Goal

Correlation between
crypto developer contribution on Stack Overflow
and
crypto developer activity on GitHub

Sample crypto question



Sample profile



Reputation **28'484**

Crypto score **543**

Crypto accepted answers **85**

Did Jay use crypto APIs on
GitHub?

Pipeline



Tag analysis



HomeQueriesUsers

Compose Query

Viewing Query

Enter a title for your query

stackoverflow
Q&A for professional and enthusiast programmers

edit description

```
1 SELECT questions.Id as [post_link],
2 questions.title as [title],
3 questions.body as [body_question],
4 answers.body as [body_answer],
5 answers.id as [answer_id],
6 questions.viewcount as [viewcount], questions.Tags as [tags],
7 questions.score as [score], answers.Score as [score_answer],
8 questions.AnswerCount as [answercount], questions.LastActivityDate,
9 questions.AcceptedAnswerId, questions.CommentCount,
10 questions.FavoriteCount, questions.LastEditorUserId,
11 questions.LastEditorDisplayName,
12 questions.LastEditDate, questions.CreationDate, questions.ClosedDate,
13 answers.LastEditDate as [answer_LastEditDate],
14 answers.CreationDate as [answer_CreationDate]
15 FROM Posts questions
16 left join Posts answers ON answers.parentid = questions.id
17 WHERE questions.Tags like '%<cryptography>%'
18 order by questions.viewcount DESC
19
```

Database Schema

Posts

Id	int
PostTypeId	tinyint
AcceptedAnswerId	int
ParentId	int
CreationDate	datetime
DeletionDate	datetime
Score	int
ViewCount	int
Body	nvarchar (max)

Revisions

Waiting for you to make your first edit...



11'130 crypto
discussions

2'184 tags

Tag analysis

$$**H1** \text{ of tag "x"} = \frac{\#posts \text{ containing "x" AND "cryptography" }}{\#posts \text{ containing "x" }}$$

$$**H2** \text{ of tag "x"} = \frac{\#posts \text{ containing "x" AND "cryptography" }}{\#posts \text{ containing "cryptography" }}$$

$$**H1** = 0.025$$

$$**H2** = 0.005$$

Tag analysis

Total: **42 Tags**

3des	aes	bouncycastle	cng	crypto++	cryptoapi	cryptographic-hash-function	cryptography
cryptojs	des	diffie-hellman	digital-signature	ecdsa	elliptic-curve	encryption-asymmetric	encryption-symmetric
encryption	hash	hmac	jce	keystore	md5	openssl	pbkdf2
pkcs#7	pkcs#11	private-key	public-key-encryption	public-key	pycrypto	rijndael	rsa
salt	sha	sha1	sha256	smartcard	x509	x509certificate	Xor

Cryptography related Users



Stack Exchange



42 tags

92'000 crypto
discussions

UserId

Crypto score

Reputation

#Crypto accepted answer

#Crypto accepted answer > 10

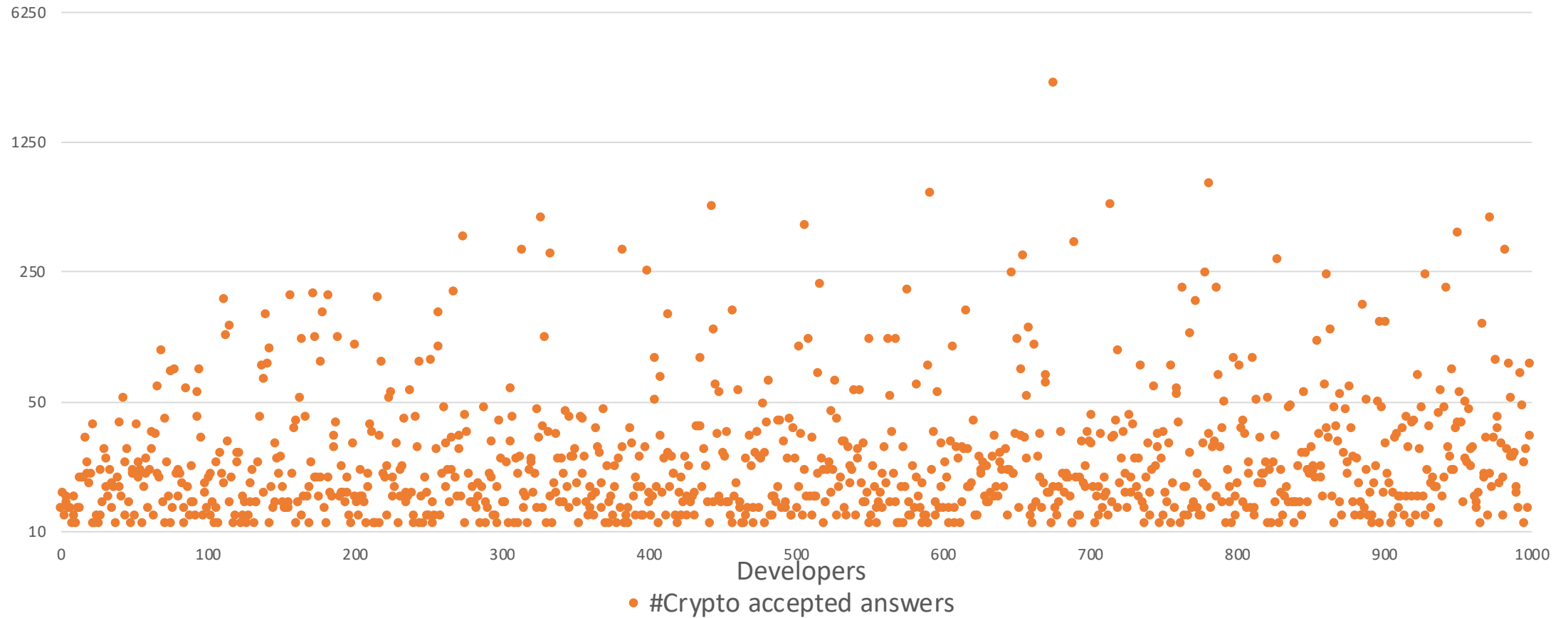
Crypto score > 10

```
select userid, sum(score), reputation, count(*) as answers from (SELECT distinct questions.
answers.score,
(select reputation from Users where id = us.Id) as reputation

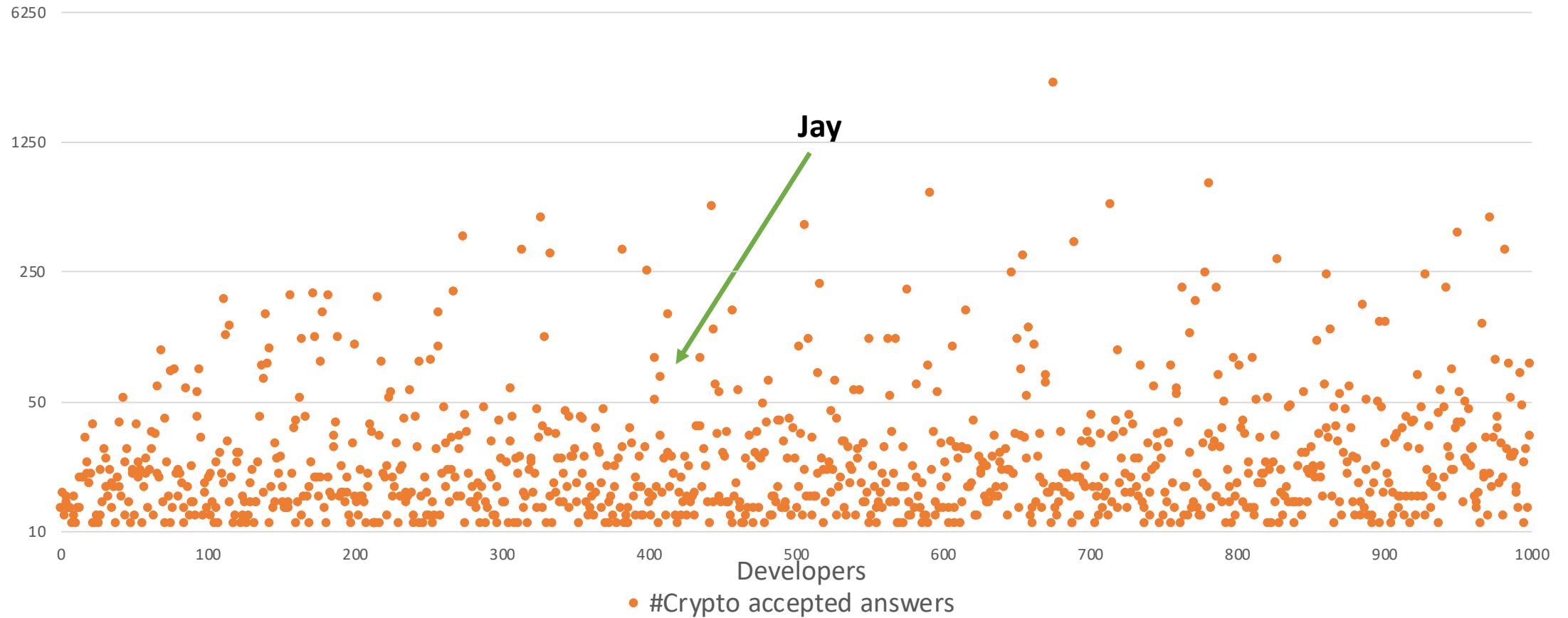
FROM Posts as questions
left JOIN Posts answers ON answers.parentid = questions.id
left join Users as us ON answers.OwnerUserId = us.id
left join posttags as pt on pt.postid = questions.id
where pt.tagid in

( select id from tags where
tagname = 'cryptography' or
tagname like 'encryption'
or tagname like 'hash'
or tagname like '3des'
or tagname like 'aes'
or tagname like 'cryptojis'
or tagname like 'sha'
or tagname like 'md5'
or tagname like 'openssl'
or tagname like 'jce'
or tagname like 'private-key'
or tagname like 'public-key-encryption'
or tagname like 'public-key'
or tagname like 'pycrypto'
or tagname like 'rijndael'
or tagname like 'rsa'
or tagname like 'salt'
or tagname like 'sha1'
or tagname like 'sha256'
or tagname like 'smartcard'
or tagname like 'x509'
or tagname like 'sha256'
or tagname like 'x509certificate'
or tagname like 'xor'
or tagname like 'pkcs#7'
or tagname like 'pbkdf2'
or tagname like 'keystore'
or tagname like 'hmac'
or tagname like 'pkcs#11'
or tagname like 'bouncycastle'
or tagname like 'cng'
or tagname like 'crypto++'
or tagname like 'cryptoapi'
or tagname like 'cryptographic-hash-function'
or tagname like 'des'
or tagname like 'diffie-hellman'
or tagname like 'digital-signature'
or tagname like 'ecdsa'
or tagname like 'elliptic-curve'
or tagname like 'encryption-asymmetric'
or tagname like 'encryption-symmetric'
)
)
and
us.Reputation > 20
and answers.PostTypeId = 2
) as mh
group by userid, reputation
having count(*) > 10 and sum(score) > 10
```

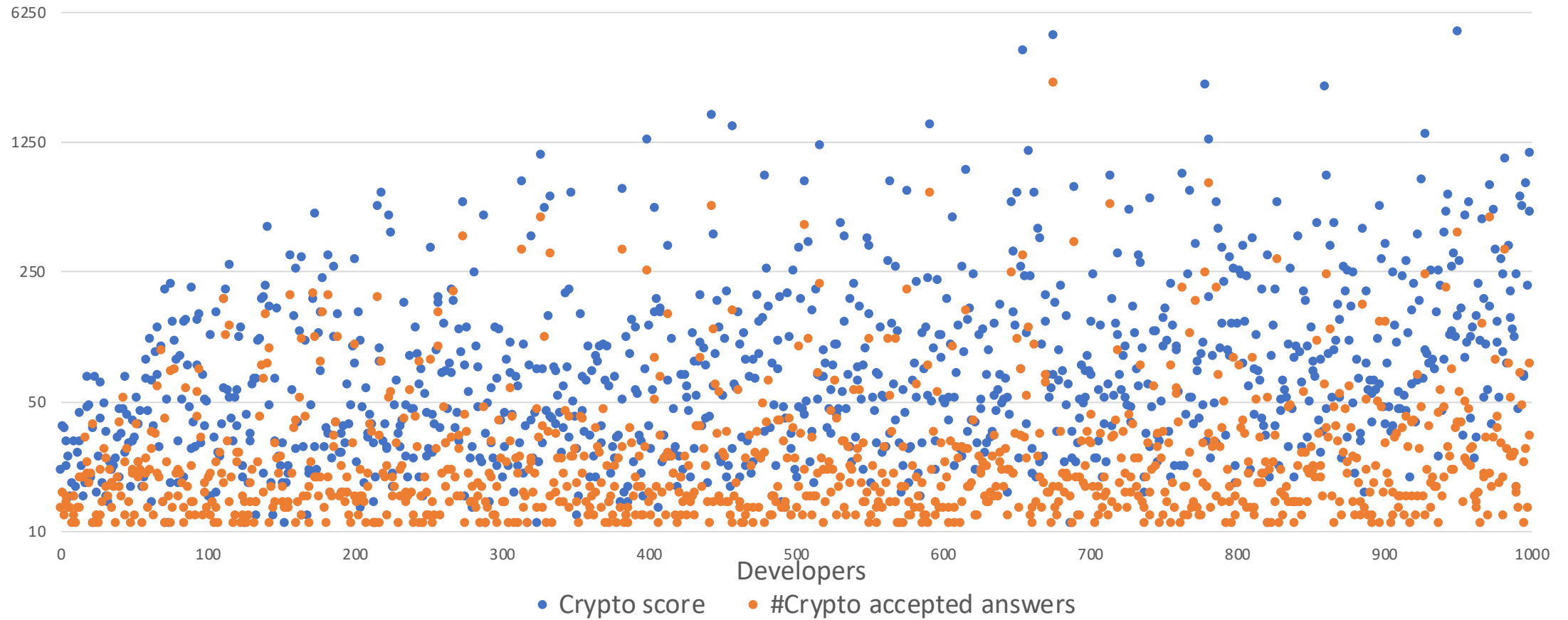
Stack OverFlow users



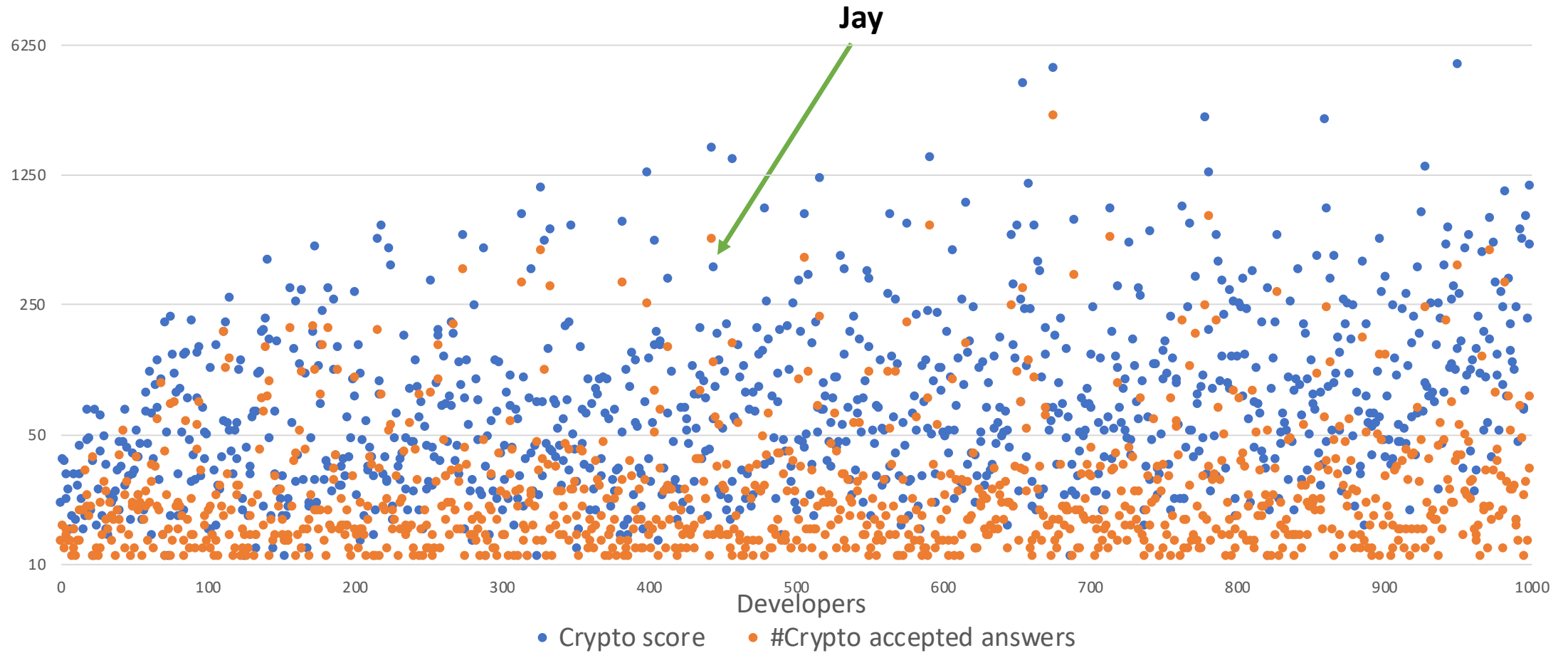
Stack OverFlow users



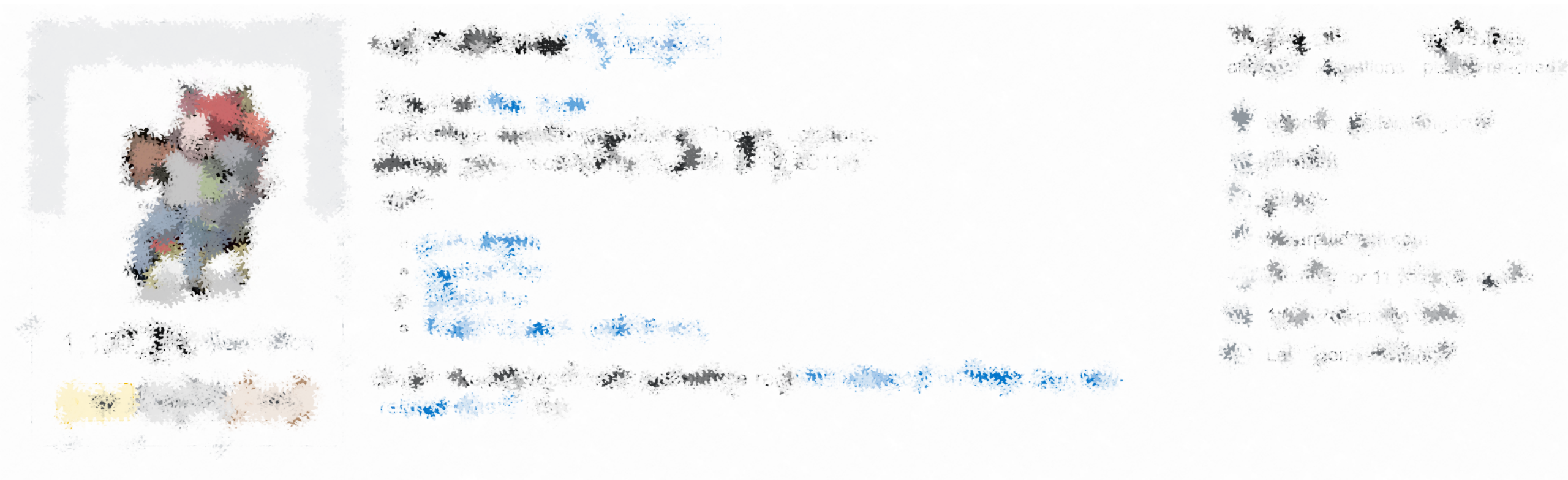
Stack OverFlow users



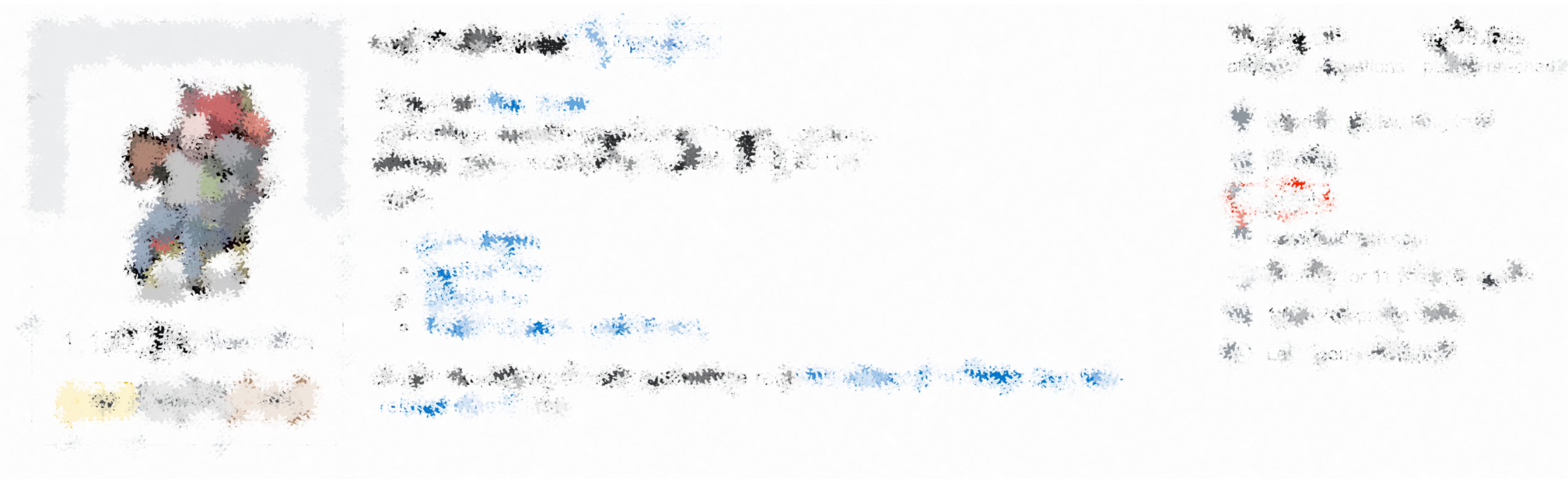
Stack OverFlow users



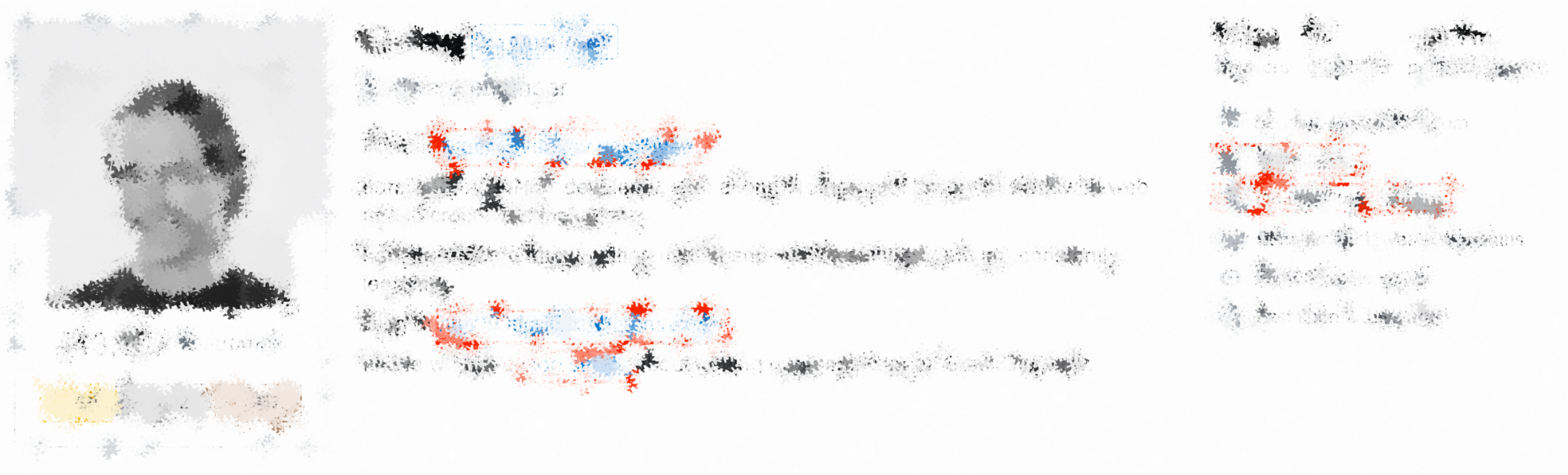
Stack OverFlow scraping



Stack OverFlow scraping

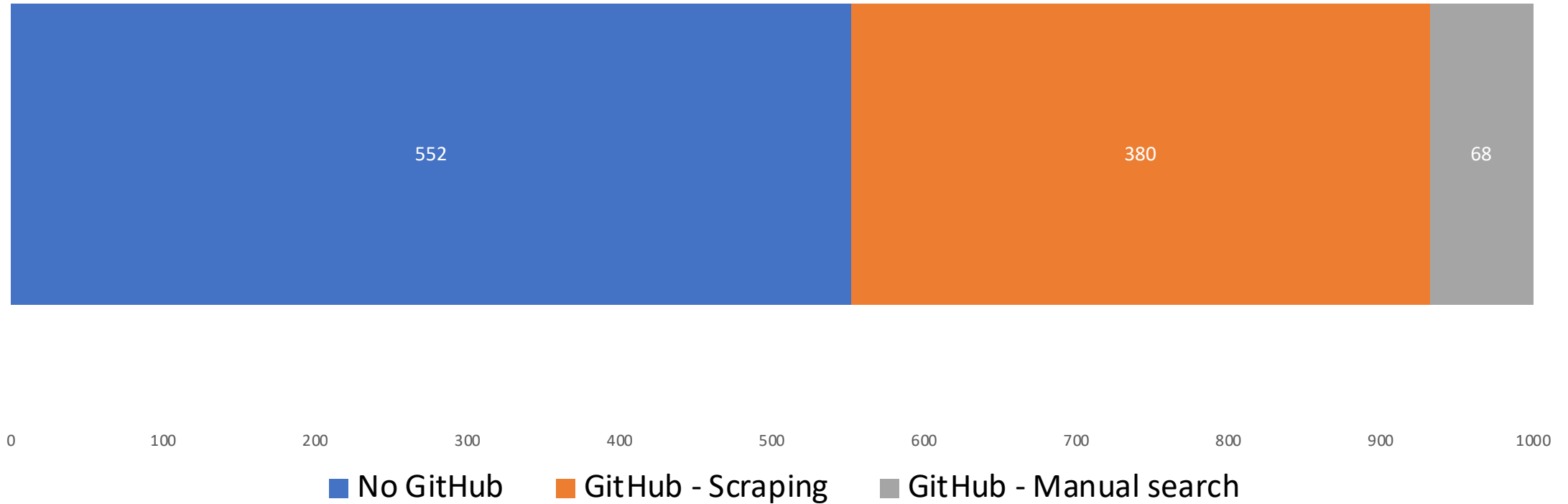


Manual search

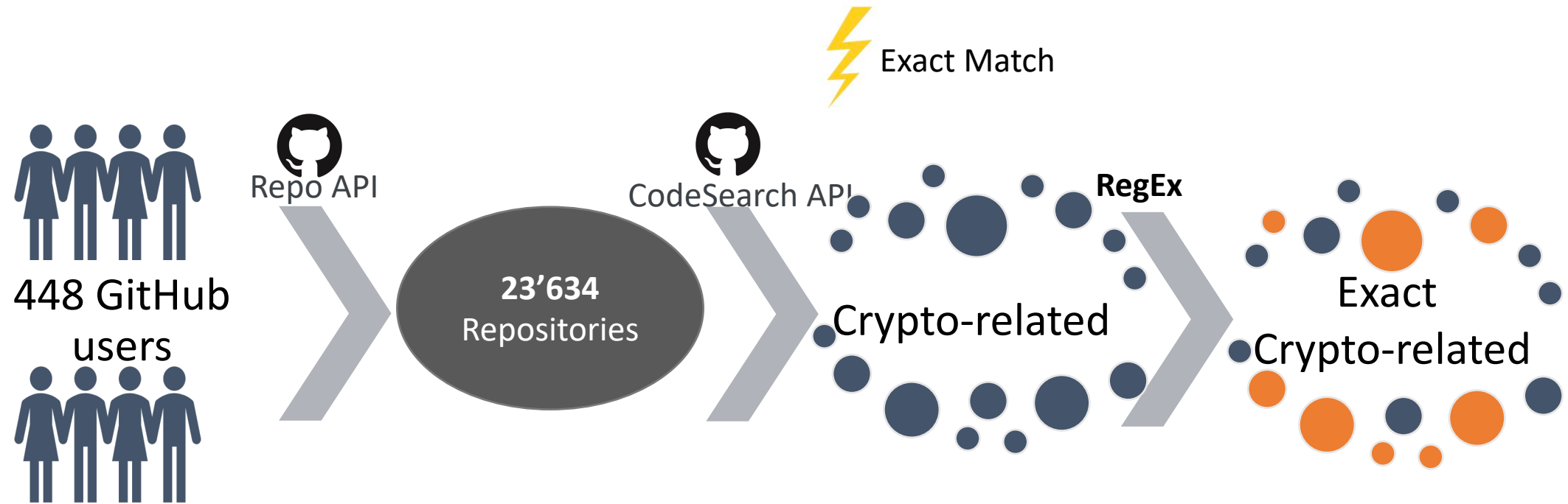


Stack Overflow crypto users

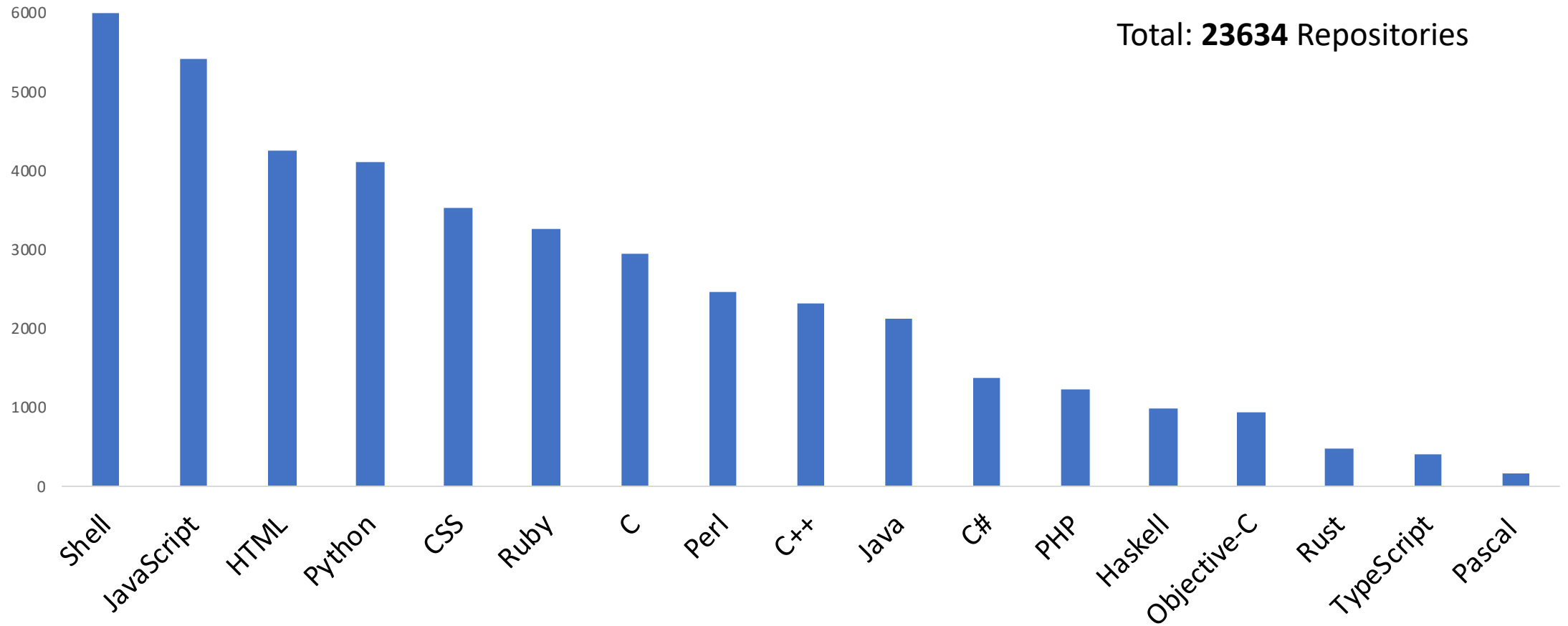
44.8% Match



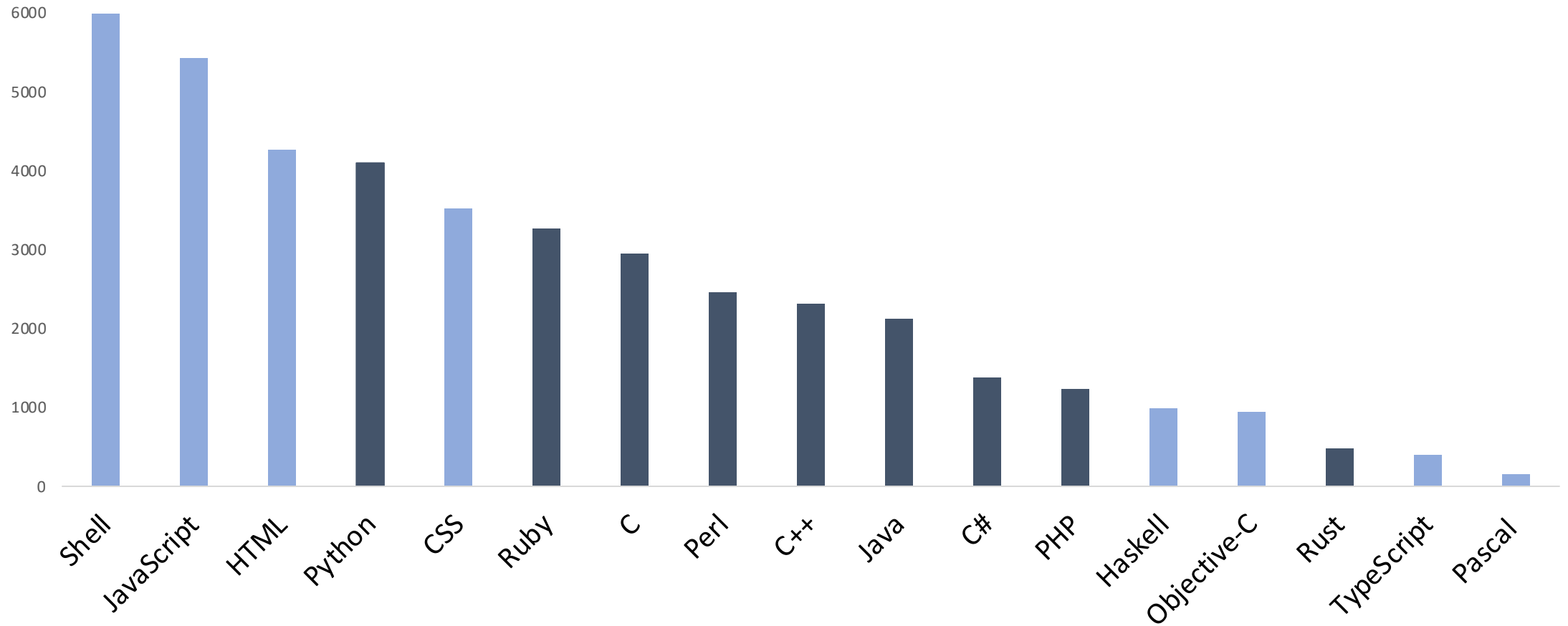
GitHub API - PyGithub



Languages



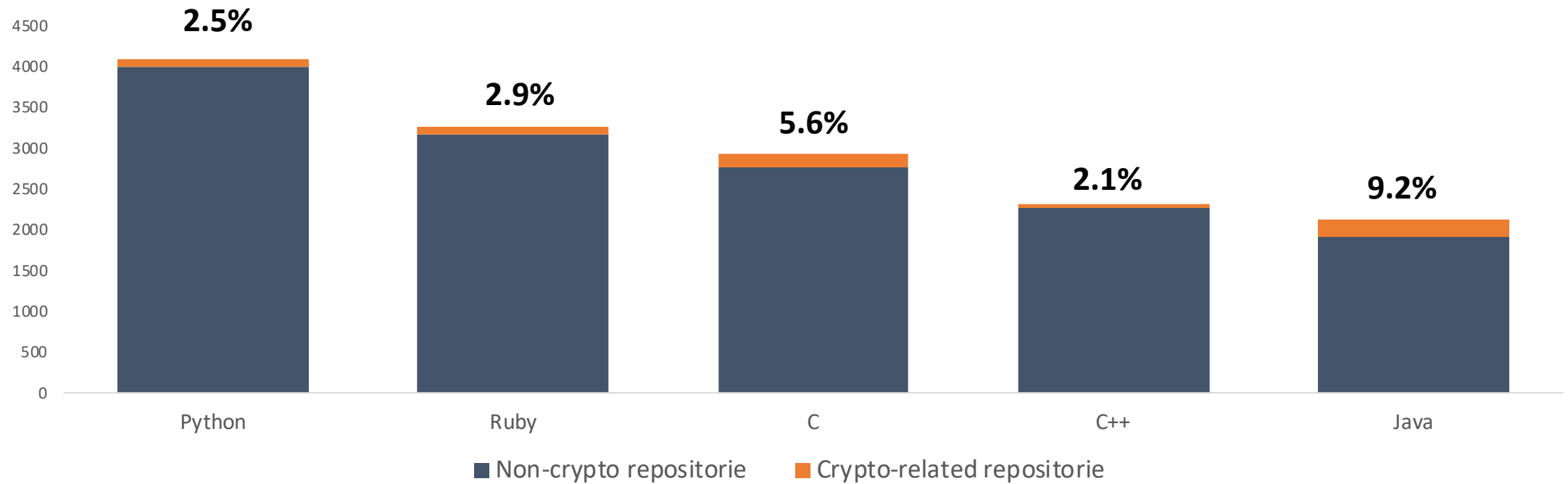
Selected languages



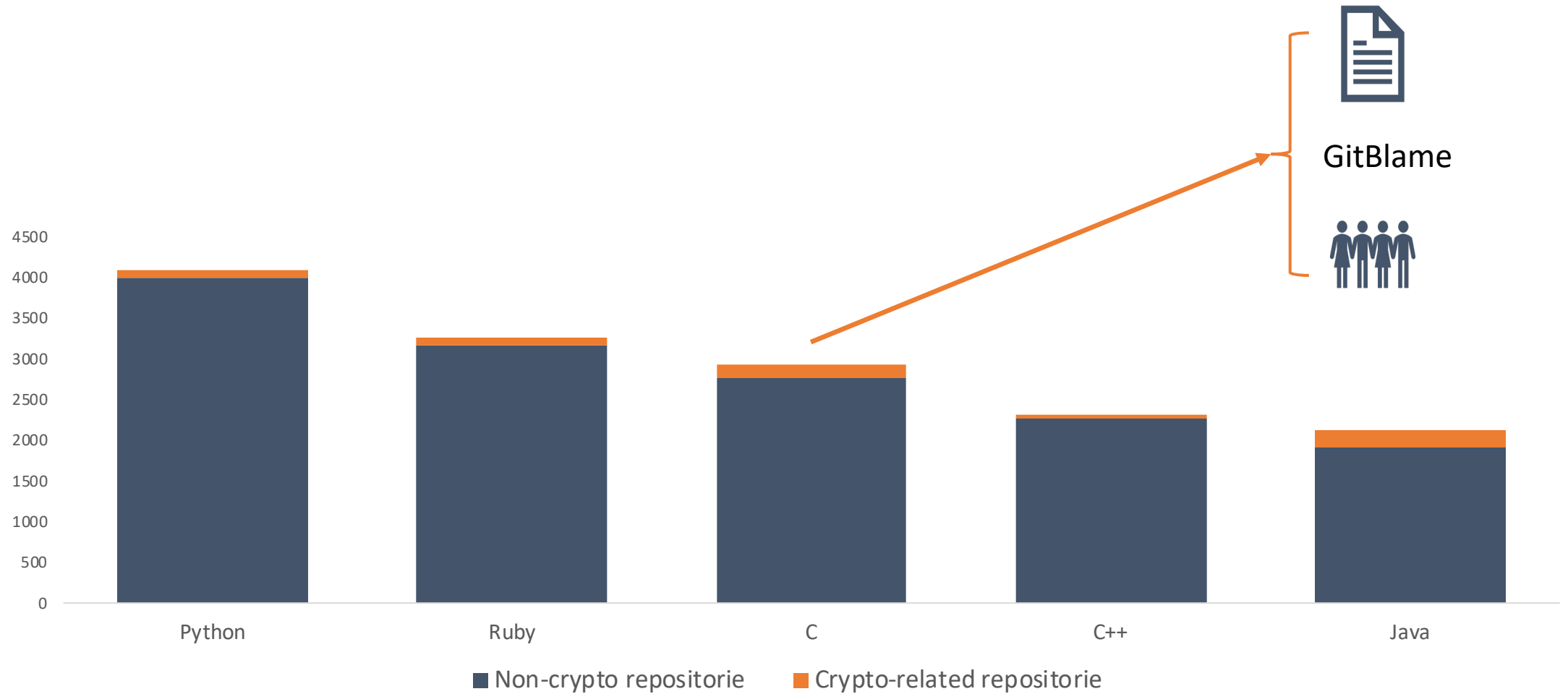
Crypto libraries

Python	Ruby	C	Perl	C++	Java	C#	PHP	Rust
from passlib.	require 'rbnac1'	include "tomcrypt_		include <botan/	Java.security			
import passlib	require 'digest'	include <tomcrypt.h>		include "cryptlib.h"	Javax.crypto			
import pbkdf2_sha256	require 'openssl'	include "paillier.h"		include <cryptlib>				
import nacl	require 'bcrypt'	include "rsa.h"		include "aes.h"				
from nacl		include "x509.h"		using CryptoPP::				
import hashlib		include "crypto_"		include <des.h>				
from hashlib		include <openssl/		include "blowfish.h"				
from crypto		include <themis/ include <wolfssl/		include "secblock.h"				
import crypto		include "xxhash.h"		include "eccrypto.h"				
from pyelliptic		include "aes.h"		include <helib/				
import bcrypt		include "md5.h"		include "cryptopp/				
from bcrypt		include "sha1.h"		include <cryptopp/				
		include "sha256.h"		include <openssl/				
		include "blowfish.h"						
		include "des.h"						

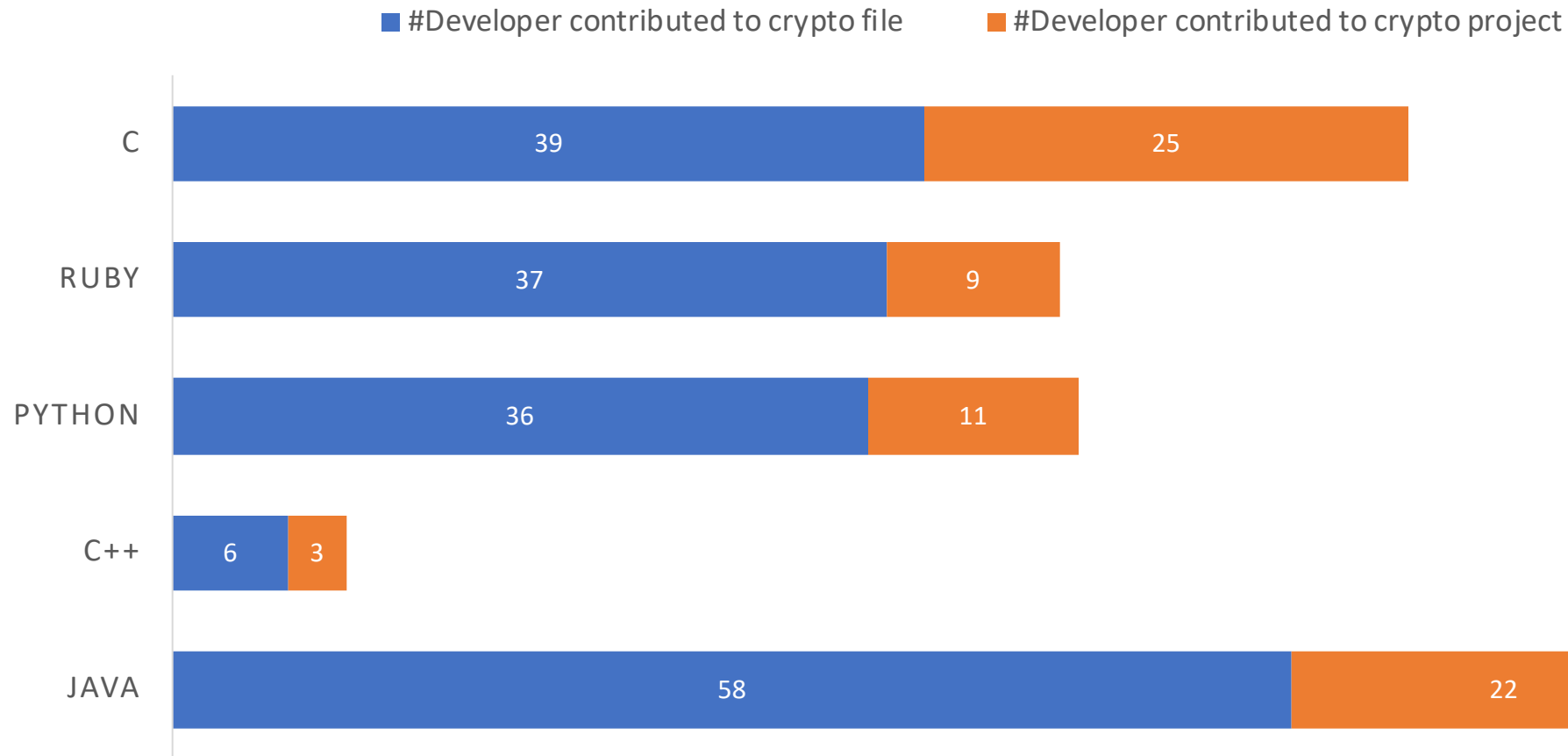
Crypto-related repositories



Crypto-related repositories



Crypto file contributor





Next steps

Remaining steps



Contributed to
crypto files



Contributed to
crypto projects



No crypto projects

?



crypto score



reputation



crypto score and
reputation

Remaining steps



Contributed to
crypto files



Contributed to
crypto projects



No crypto projects

?



crypto score



reputation



crypto score and
reputation

Remaining steps



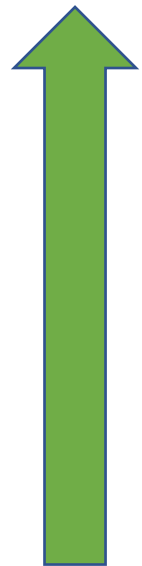
Contributed to
crypto files



Contributed to
crypto projects



No crypto projects



crypto score

?

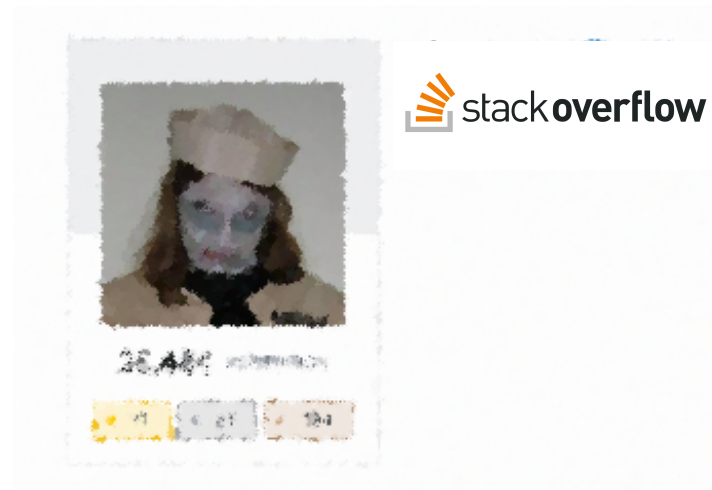


reputation



crypto score and
reputation

How experienced is Jay?



Reputation **28'484**

Crypto accepted answers **85**

Crypto score **543**

Repositories **45**

Crypto repositories **3**

Crypto files **87**

Crypto files contribution **5**

Summary

