

day 7

cs50.harvard.edu

3:15ish



wired.com/2015/04/anonabox-recall/

Are gem installs in ruby similar to installing frameworks like Flask in Python?

What's the difference between an object oriented language and the languages we've talked about so far?

Are there inherent advantages in using procedural, functional, and object-oriented languages in the same way that there are advantages in compiled vs. interpreted languages?

Are all programming languages in English?

wikipedia.org/wiki/Non-English-based_programming_languages

[blogs.msdn.com/b/alfredth/archive/2011/07/21/
why-are-all-programming-languages-in-english.aspx](https://blogs.msdn.com/b/alfredth/archive/2011/07/21/why-are-all-programming-languages-in-english.aspx)

What were the key takeaways of today's class? I followed the demos, but was not sure what the generalizable principles are. I took away

** You can create functions so you don't have to re-write. These can be powerful and speed up things in all manner of ways*

** You can use other people's pre-coded functions via libraries*

** You can use python to change the html code itself*

** Your code can pull from the url line*

What else was a generalizable lesson? (there were certainly several wow moments too—the spiderman ones, but were they generalizable?)

*I'm afraid that I cannot access "Discuss" so
would like to mention my problem here. I could
run all python programs in the folder "src6" well
except froshims-3 and hello-2.*

For this assignment, I changed the sentence within the hello.html file to something other than hello, world and it did not update on the website. Is this because I had to change the python code instead of the html file?

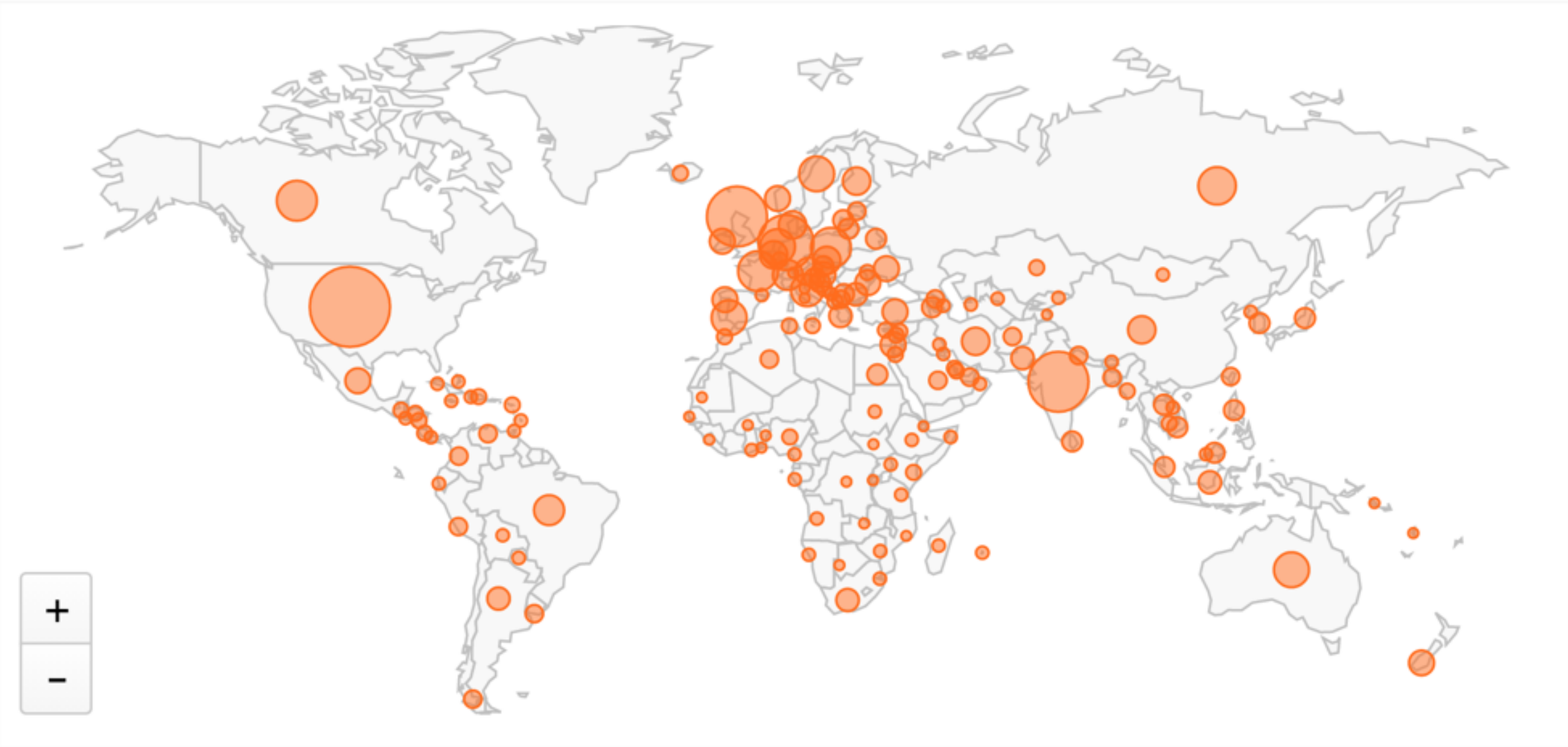
[stackoverflow.com/research/
developer-survey-2015](https://stackoverflow.com/research/developer-survey-2015)

I. GEOGRAPHY

Respondents

Active Users







World Population



II. DEVS PER CAPITA

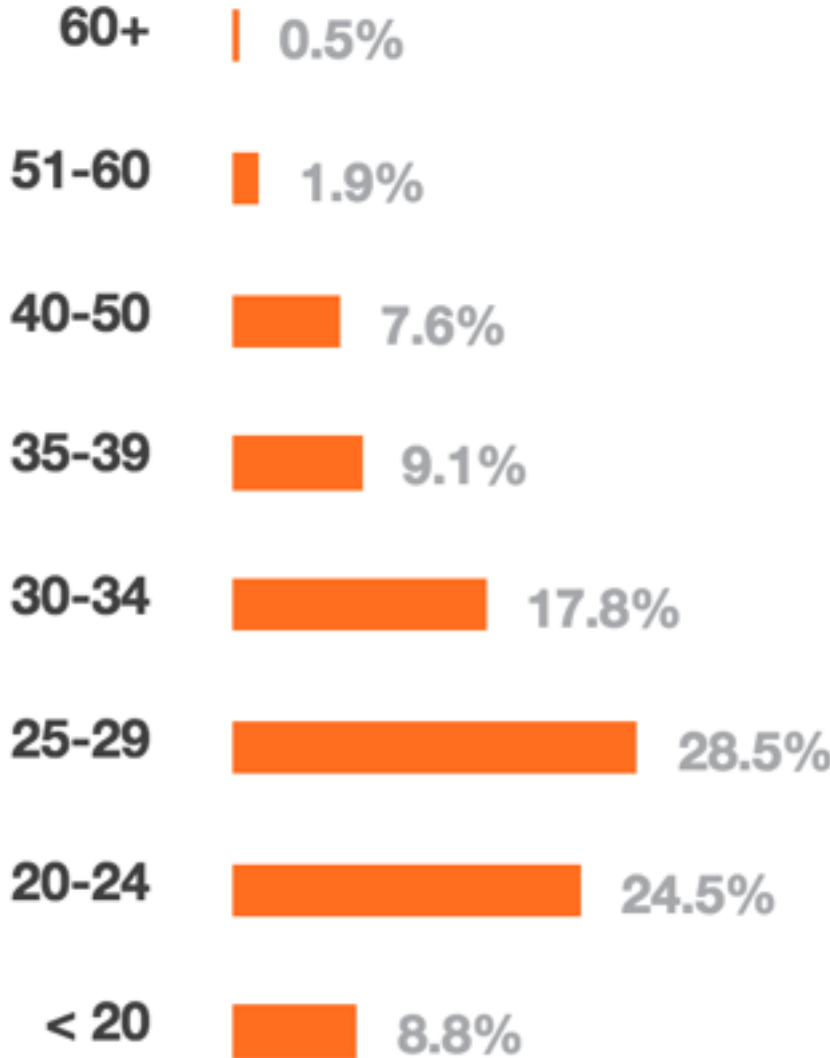
Top 6

Bottom 6

	Country	Devs per 1,000 people
	Luxembourg	39.8
	Iceland	35.0
	Sweden	35.0
	Israel	33.4
	Finland	33.0
	Singapore	31.7

With devs defined as return users. Among countries with at least 10,000 monthly Stack Overflow sessions.

III. AGE



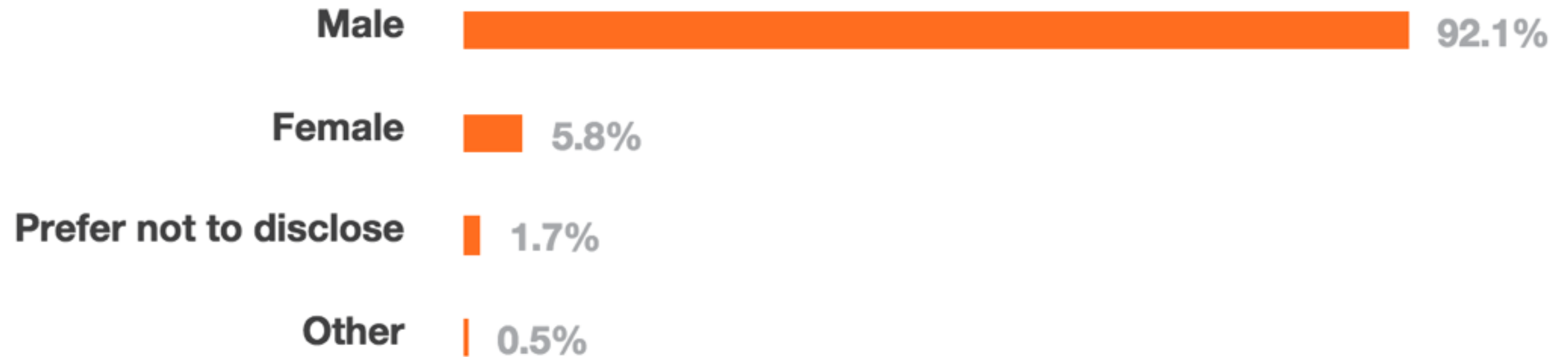
25,831 responses

IV. AGE BY COUNTRY

	Country	Developer Age (avg.)
	United States	31.6
	United Kingdom	30.3
	Canada	30.3
	France	28.6
	Germany	29.0
	Poland	26.7
	Russia	26.6
	India	25.0

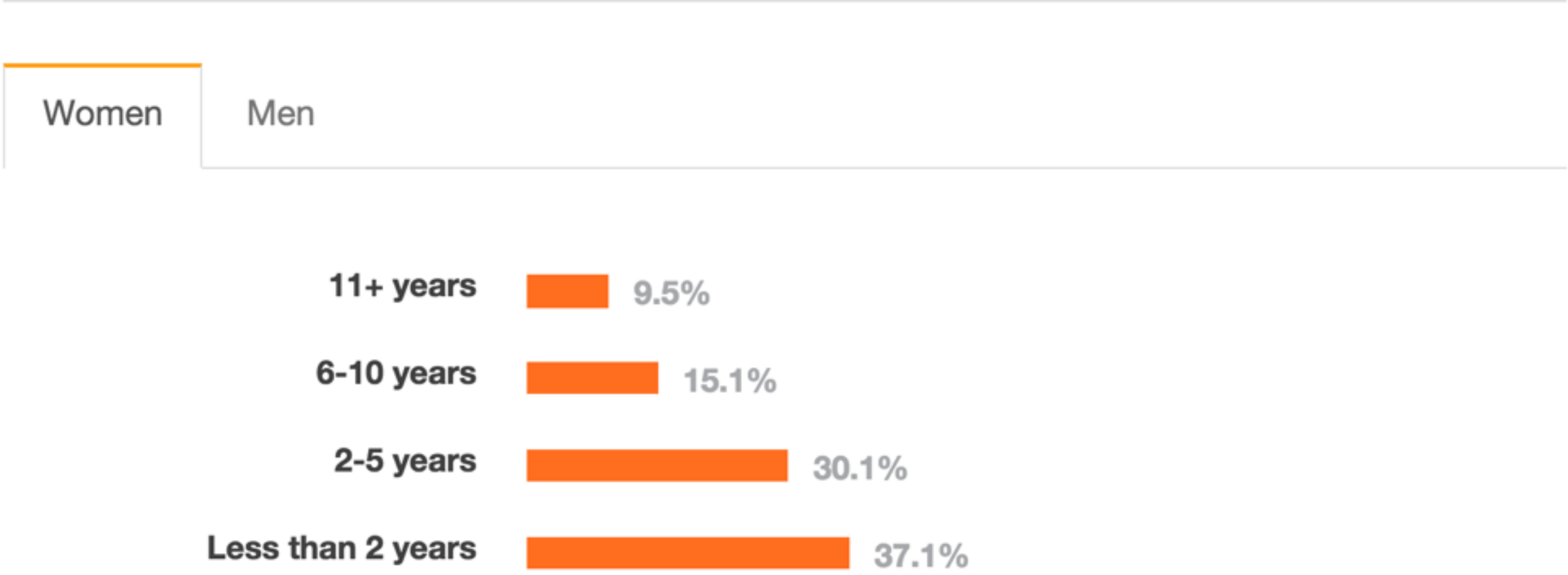
Among countries with at least 10 mil population

V. GENDER



25,744 responses

VII. WOMEN WHO CODE



Compared with men, women who code are nearly twice as likely to have less than 2 years programming experience. We hope this means more women are joining the industry and closing the gender gap.

VII. WOMEN WHO CODE

Women

Men



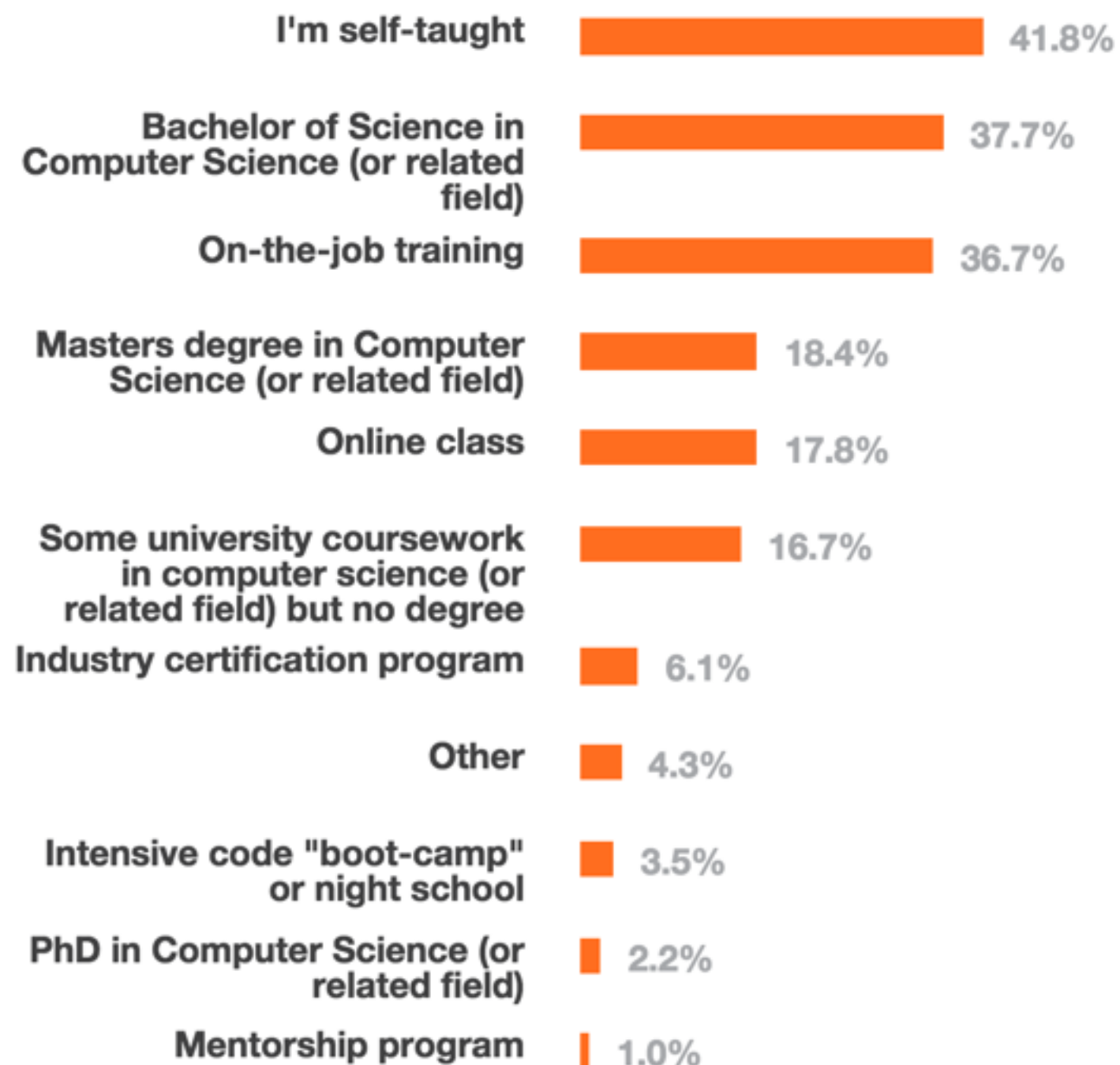
Compared with men, women who code are nearly twice as likely to have less than 2 years programming experience. We hope this means more women are joining the industry and closing the gender gap.

VI. EXPERIENCE



24,827 responses

VIII. EDUCATION



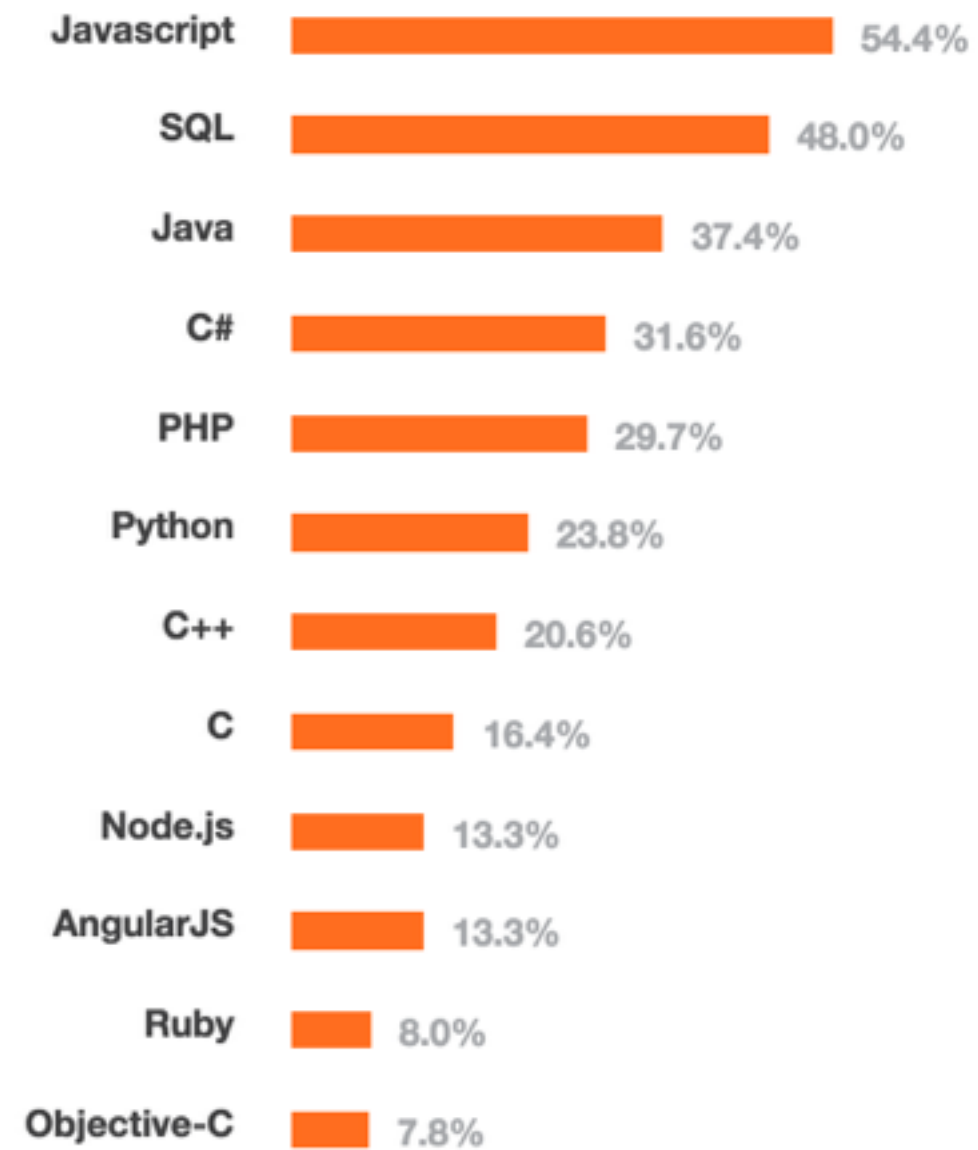
21,314 responses

I. MOST POPULAR TECHNOLOGIES

2015

2014

2013



21,982 responses

NoSQL

```
{
  "_id": "02134",
  "city": "ALLSTON",
  "loc": [
    -71.13286600000001,
    42.353519
  ],
  "pop": 23775,
  "state": "MA"
}
```

```
{
  _id: <ObjectId1>,
  username: "123xyz",
  contact: {
    phone: "123-456-7890",
    email: "xyz@example.com"
  },
  access: {
    level: 5,
    group: "dev"
  }
}
```



Embedded sub-document



Embedded sub-document

user document

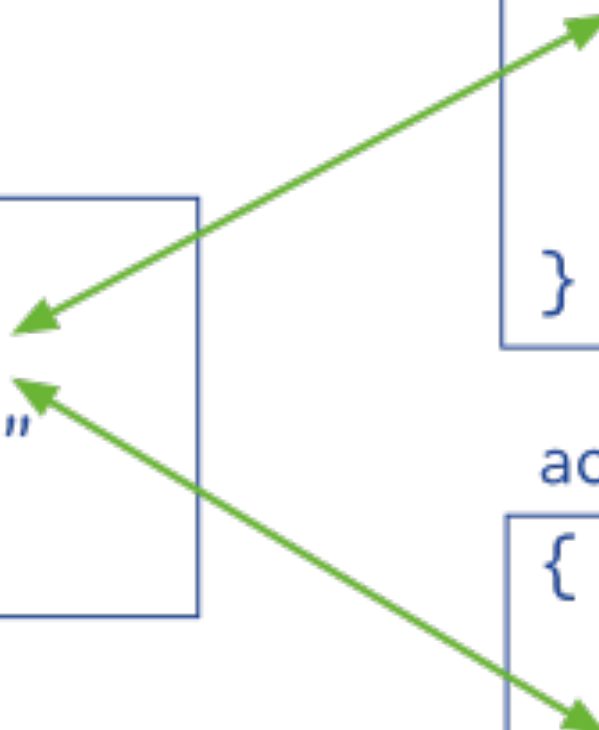
```
{
  _id: <ObjectId1>,
  username: "123xyz"
}
```

contact document

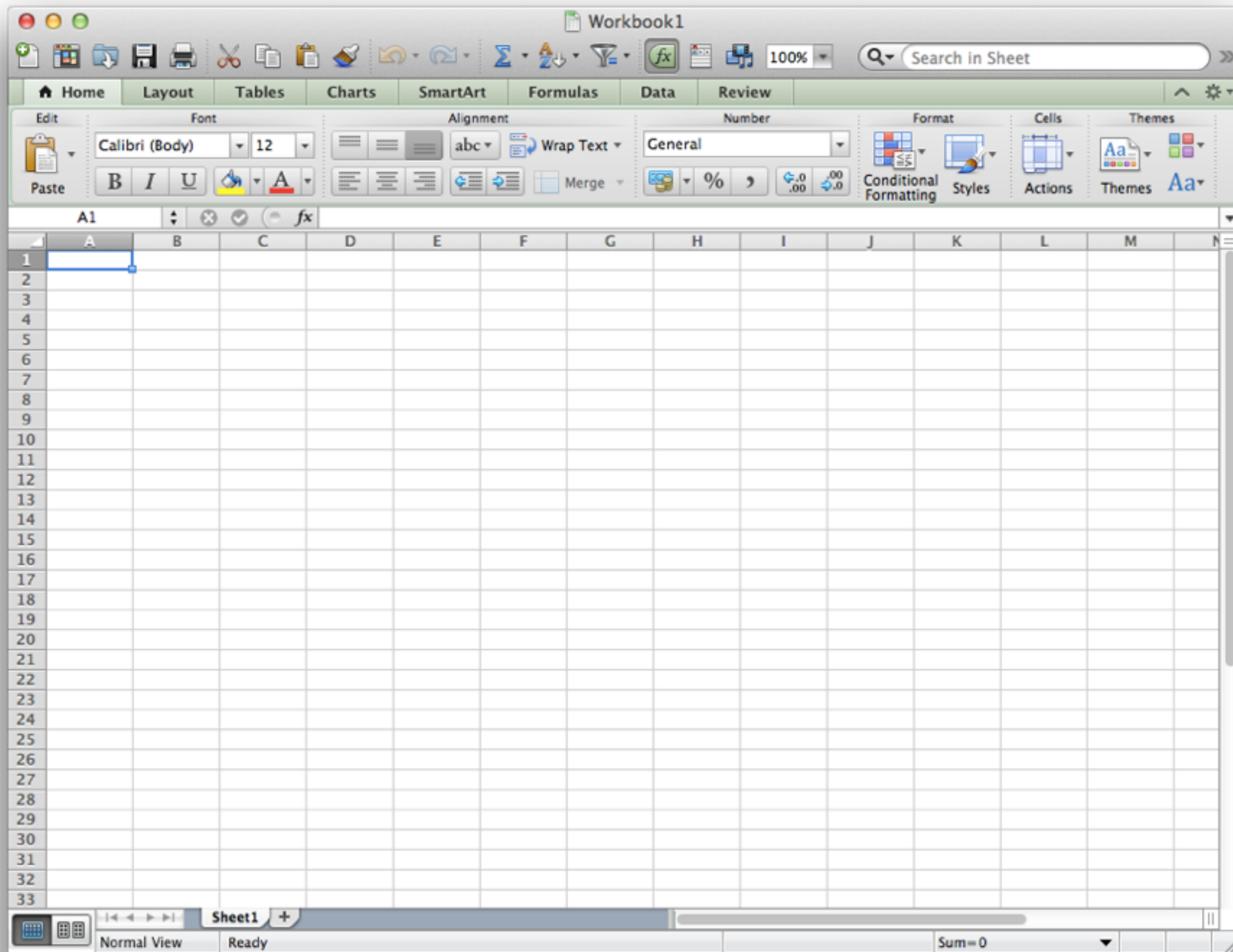
```
{
  _id: <ObjectId2>,
  user_id: <ObjectId1>,
  phone: "123-456-7890",
  email: "xyz@example.com"
}
```

access document

```
{
  _id: <ObjectId3>,
  user_id: <ObjectId1>,
  level: 5,
  group: "dev"
}
```



SQL



SQL

DELETE

INSERT

UPDATE

SELECT

...


```
Terminal
File Edit View Terminal Tabs Help
jharvard@appliance (~): mysql -u jharvard -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 1636
Server version: 5.5.32-MariaDB MariaDB Server

Copyright (c) 2000, 2013, Oracle, Monty Program Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> █
```

cs50-jharvard.c9.io / 127.0 x

https://cs50-jharvard.c9.io/phpmyadmin/

Server: 127.0.0.1

Databases SQL Status Users Export Import More

phpMyAdmin

(Recent tables) ...

- + c9
- + information_schema
- + mysql
- + performance_schema
- + phpmyadmin

General Settings

- [Change password](#)
- Server connection collation: utf8_general_ci

Appearance Settings

- Language: English
- Theme: pmahomme
- Font size: 82%
- [More settings](#)

Database server

- Server: 127.0.0.1 via TCP/IP
- Server type: MySQL
- Server version: 5.5.40-0ubuntu0.14.04.1 - (Ubuntu)
- Protocol version: 10
- User: jharvard@localhost
- Server charset: UTF-8 Unicode (utf8)

Web server

- Apache/2.4.7 (Ubuntu)
- Database client version: libmysql - 5.5.40
- PHP extension: mysqli

phpMyAdmin

- Version information: 4.0.10deb1
- [Documentation](#)
- [Wiki](#)
- [Official Homepage](#)
- [Contribute](#)
- [Get support](#)
- [List of changes](#)

types

- CHAR
- VARCHAR
- INT
- BIGINT
- DECIMAL
- DATETIME
- ...

indexes

- PRIMARY
- UNIQUE
- INDEX
- FULLTEXT

storage engines

- InnoDB
- MyISAM
- Archive
- Memory
- ...



atomicity

```
INSERT INTO table (id, symbol, shares) VALUES(7, "GOOG", 10)  
ON DUPLICATE KEY UPDATE shares = shares + VALUES(shares)
```

transactions

```
START TRANSACTION;  
UPDATE account SET balance = balance - 1000 WHERE number = 2;  
UPDATE account SET balance = balance + 1000 WHERE number = 1;  
COMMIT;
```


SQL injection attack



HARVARD
UNIVERSITY

PINSYSTEM

[FAQ](#) | [HELP](#) | [PRIVACY](#) | [LOGOUT](#)

Select a Login type: [What is a login type?](#)

- Harvard University ID (HUID)
 XID Login

Login ID:

[What is a login ID?](#)

PIN / Password:

[What is a PIN / Password?](#)

Login

[New user? Forgot your PIN / Password?](#)

Login

[New user? Forgot your PIN / Password?](#)

```
$username = $_POST["username"];  
$password = $_POST["password"];  
query("SELECT * FROM users WHERE username='{ $username }' AND password='{ $password }'");
```



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PINSYSTEM

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Select a login type: [What is a login type?](#)

- Harvard University ID (HUID)
 XID Login

login ID:

skroob

[What is a login ID?](#)

PIN / Password:

12345' OR '1' = '1

[What is a PIN / Password?](#)

Login

[New user? Forgot your PIN / Password?](#)

login

[New user? Forgot your PIN / Password?](#)

```
$username = $_POST["username"];  
$password = $_POST["password"];  
query("SELECT * FROM users WHERE username='{ $username }' AND password='{ $password }'");
```

```
$username = $_POST["username"];  
$password = $_POST["password"];  
query("SELECT * FROM users WHERE username='skroob' AND password='12345' OR '1' = '1'");
```

```
$username = $_POST["username"];  
$password = $_POST["password"];  
query("SELECT * FROM users WHERE username=? AND password=?", $username, $password);
```

```
$username = $_POST["username"];  
$password = $_POST["password"];  
query("SELECT * FROM users WHERE username='skroob' AND password='12345\' OR \'1\' = \'1\'");
```


HI, THIS IS YOUR SON'S SCHOOL. WE'RE HAVING SOME COMPUTER TROUBLE.



OH, DEAR - DID HE BREAK SOMETHING?

IN A WAY -)



DID YOU REALLY NAME YOUR SON Robert'); DROP TABLE Students;-- ?



OH, YES. LITTLE BOBBY TABLES, WE CALL HIM.

WELL, WE'VE LOST THIS YEAR'S STUDENT RECORDS. I HOPE YOU'RE HAPPY.



AND I HOPE YOU'VE LEARNED TO SANITIZE YOUR DATABASE INPUTS.



WE CALL HIM.



DATABASE INPUTS.

to be continued