IBM Capstone Project 2019 Developer Survey Status

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OUTLINE

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- Introduction
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EXECUTIVE SUMMARY

- Programming technologies are leading many innovations around the world

- Dataset used: Stack Overflow Developers Survey 2019

- Main questions:
  - Most common developers' tools used
  - Forecast for the developers' tools in the following year
  - Risks and opportunities
  - Demographic profile of the developers

- Highest influence of Web Development Languages

- Majority of Developers are from US, male and below 40 years old (Demographic gaps)

- Stable scenario for top 4 Platforms (AWS, Windows, Linux, Docker)

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INTRODUCTION

- Programming Technologies are constantly expanding, driving advances and innovation around the world.

- Tech developers are one of the most wanted professionals in digital world, increasing competition and qualification requirements.

- This project analyzes the main technologies used and the Developers profile in the year of 2019.

- Main questions:
  - Most common developers' tools used
  - Forecast for the developers' tools in the following year
  - Risks and opportunities
  - Demographic profile of the developers

METHODOLOGY

- Sources:
  - [Stack Overflow 2019 Developer survey results](#)

  - [IBM Programming Languages Annual Salaries](#)

  - [Job posting](#)

- Main Steps
  - Data Collection (Python)
  - Data Wrangling (Python)
  - Exploratory Data Analysis (Python)
  - Data Visualization (Python – Google Looker)
  - Present Findings and Results (PowerPoint)

METHODOLOGY

- Stack OverFlow 2019 Survey

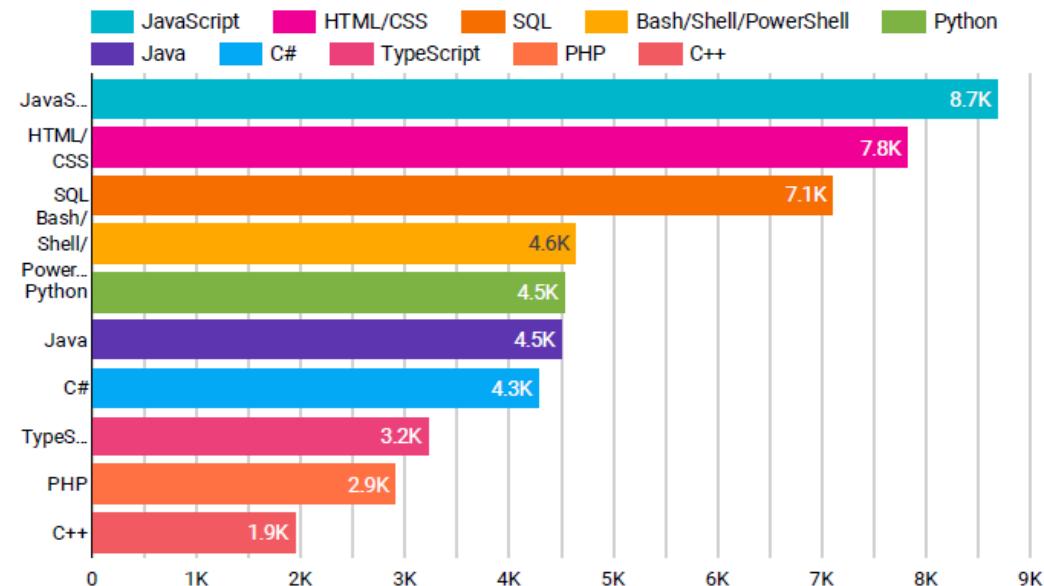|	Respondent	MainBranch	Hobbyist	OpenSourcer	OpenSource	Employment	Country	Student	EdLevel	UndergradMajor	...	WelcomeChange	SONewContent	Age	Gender	Trans	Sexuality	Ethnicity	Dependents	SurveyLength	SurveyEase
0	4	I am a developer by profession	No	Never	The quality of OSS and closed source software ...	Employed full-time	United States	No	Bachelor's degree (BA, BS, B.Eng., etc.)	Computer science, computer engineering, or sof...	...	Just as welcome now as I felt last year	Tech articles written by other developers;Indu...	22.0	Man	No	Straight / Heterosexual	White or of European descent	No	Appropriate in length	Easy
1	9	I am a developer by profession	Yes	Once a month or more often	The quality of OSS and closed source software ...	Employed full-time	New Zealand	No	Some college/university study without earning ...	Computer science, computer engineering, or sof...	...	Just as welcome now as I felt last year	NaN	23.0	Man	No	Bisexual	White or of European descent	No	Appropriate in length	Neither easy nor difficult
2	13	I am a developer by profession	Yes	Less than once a month but more than once per ...	OSS is, on average, of HIGHER quality than pro...	Employed full-time	United States	No	Master's degree (MA, MS, M.Eng., MBA, etc.)	Computer science, computer engineering, or sof...	...	Somewhat more welcome now than last year	Tech articles written by other developers;Cour...	28.0	Man	No	Straight / Heterosexual	White or of European descent	Yes	Appropriate in length	Easy
3	16	I am a developer by profession	Yes	Never	The quality of OSS and closed source software ...	Employed full-time	United Kingdom	No	Master's degree (MA, MS, M.Eng., MBA, etc.)	NaN	...	Just as welcome now as I felt last year	Tech articles written by other developers;Indu...	26.0	Man	No	Straight / Heterosexual	White or of European descent	No	Appropriate in length	Neither easy nor difficult
4	17	I am a developer by profession	Yes	Less than once a month but more than once per ...	The quality of OSS and closed source software ...	Employed full-time	Australia	No	Bachelor's degree (BA, BS, B.Eng., etc.)	Computer science, computer engineering, or sof...	...	Just as welcome now as I felt last year	Tech articles written by other developers;Indu...	29.0	Man	No	Straight / Heterosexual	Hispanic or Latino/Latina;Multiracial	No	Appropriate in length	Easy
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11547	25136	I am a developer by profession	Yes	Never	OSS is, on average, of HIGHER quality than pro...	Employed full-time	United States	No	Master's degree (MA, MS, M.Eng., MBA, etc.)	Computer science, computer engineering, or sof...	...	Just as welcome now as I felt last year	Tech articles written by other developers;Cour...	36.0	Man	No	Straight / Heterosexual	White or of European descent	No	Appropriate in length	Difficult
11548	25137	I am a developer by profession	Yes	Never	The quality of OSS and closed source software ...	Employed full-time	Poland	No	Master's degree (MA, MS, M.Eng., MBA, etc.)	Computer science, computer engineering, or sof...	...	A lot more welcome now than last year	Tech articles written by other developers;Tech...	25.0	Man	No	Straight / Heterosexual	White or of European descent	No	Appropriate in length	Neither easy nor difficult
11549	25138	I am a developer by profession	Yes	Less than once per year	The quality of OSS and closed source software ...	Employed full-time	United States	No	Master's degree (MA, MS, M.Eng., MBA, etc.)	Computer science, computer engineering, or sof...	...	A lot more welcome now than last year	Tech articles written by other developers;Indu...	34.0	Man	No	Straight / Heterosexual	White or of European descent	Yes	Too long	Easy
11550	25141	I am a developer by profession	Yes	Less than once a month but more than once per ...	OSS is, on average, of LOWER quality than prop...	Employed full-time	Switzerland	No	Secondary school (e.g. American high school, G...	NaN	...	Somewhat less welcome now than last year	NaN	25.0	Man	No	Straight / Heterosexual	White or of European descent	No	Appropriate in length	Easy
11551	25142	I am a developer by profession	Yes	Less than once a month but more than once per ...	OSS is, on average, of HIGHER quality than pro...	Employed full-time	United Kingdom	No	Other doctoral degree (Ph.D, Ed.D., etc.)	A natural science (ex. biology, chemistry, phy...	...	Just as welcome now as I felt last year	Tech articles written by other developers;Tech...	30.0	Man	No	Bisexual	White or of European descent	No	Appropriate in length	Easy

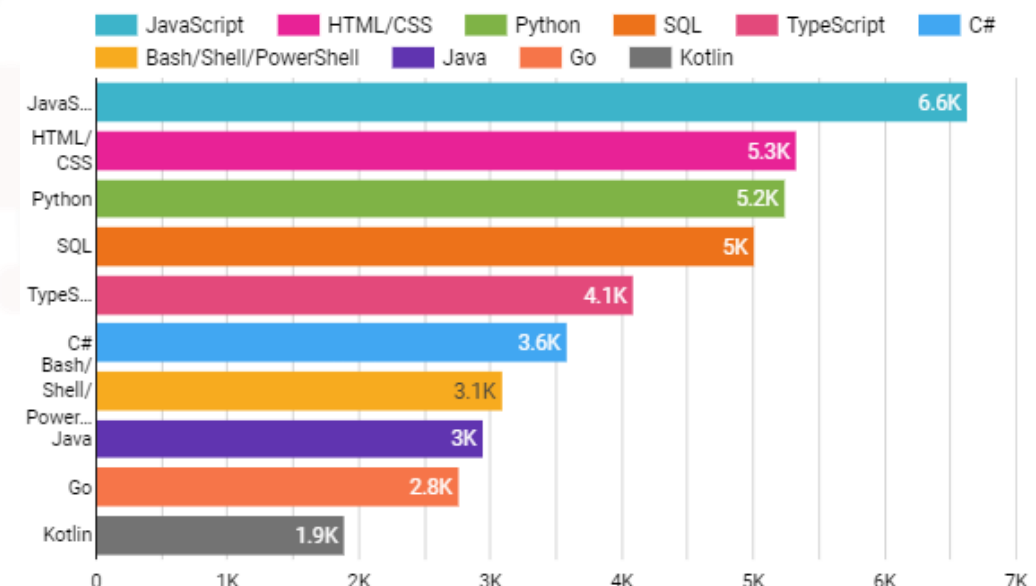11552 rows × 85 columns

RESULTS

PROGRAMMING LANGUAGE TRENDS

Current Year (2019)

Following Year (2020)

PROGRAMMING LANGUAGE TRENDS - FINDINGS & IMPLICATIONS

Findings

- JavaScript and HTML/CSS on top for actual and following year
- Python top 3 for following year
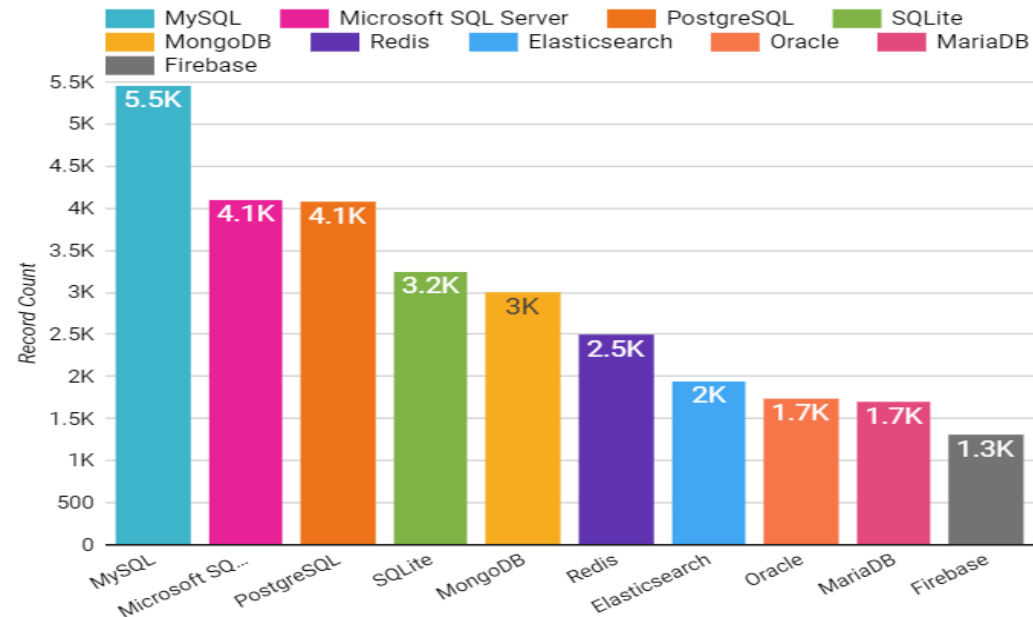- Go and Kotlin growing in following year scenario

Implications

- Web development languages in high demand on tech domain
- User experience being highlighted by FrontEnd Languages efforts
- Advances in AI, ML and DataSciente/Analytics increases Python relevance in future scenarios
- Go and Kotlin as new languages to be observed in the future

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DATABASE TRENDS

Current Year

Following Year

DATABASE TRENDS - FINDINGS & IMPLICATIONS

Findings

- 4 SQL Databases on Top 5 actual year
- 3 NoSQL Databases on Top5 for next year
- PostgreSQL on top of next year trends
- Oracle not listed on top10 Database for the following year

Implications

- NoSQL databases are expanding (flexible data models and large data volume)
- SQL databases still relevant (complex relationships and structured data)
- Open source databases still relevant but no-open source databases are growing in importance and usage

DASHBOARD

DASHBOARD - Google Looker Studio

https://github.com/RicardoMello92/IBM-Data-Analyst/blob/d7686c3076bcb747781f7d36a4d7fbe45c3f1445/Google%20Looker%20-%20IBM_Data_Analyst_Capstone_Project.pdf

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DASHBOARD TAB 1

Top 10 Languages Worked With
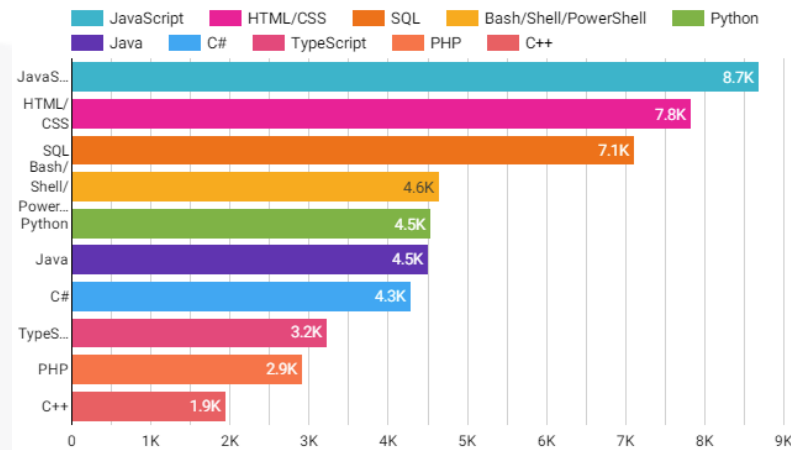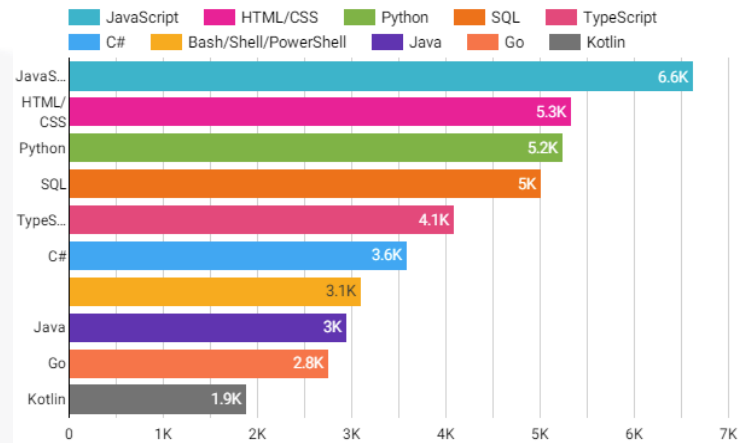
Top 10 Databases Worked With
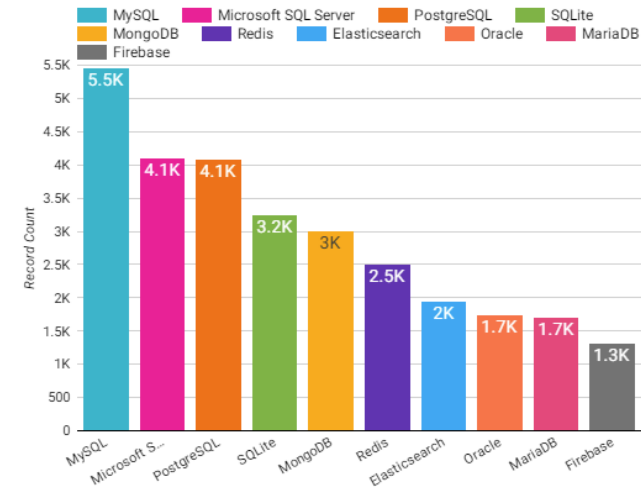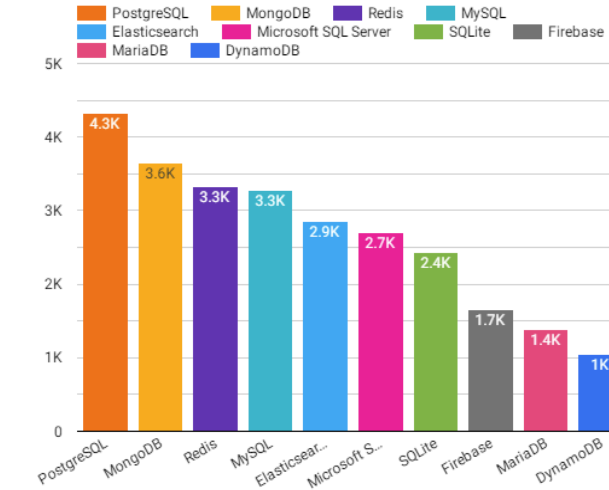
Platform Worked With

Top 10 WebFrame Worked With
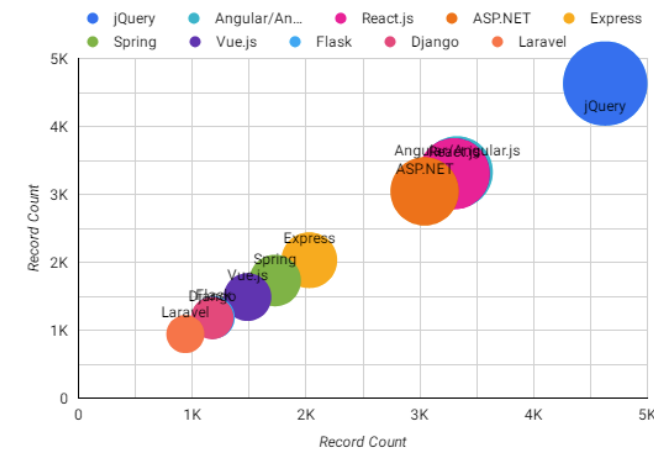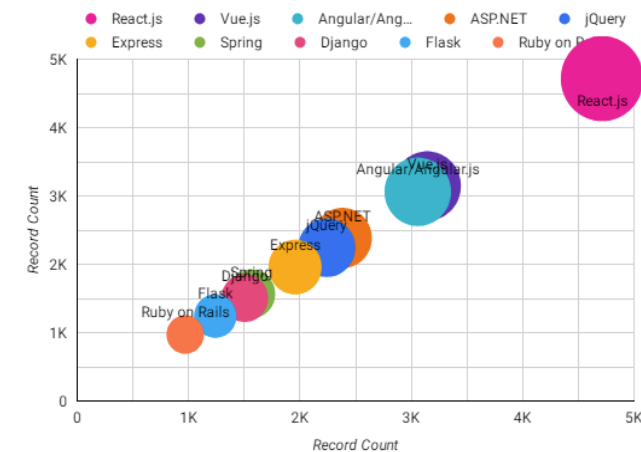
DASHBOARD TAB 2

Top 10 Languages Desired Next Year
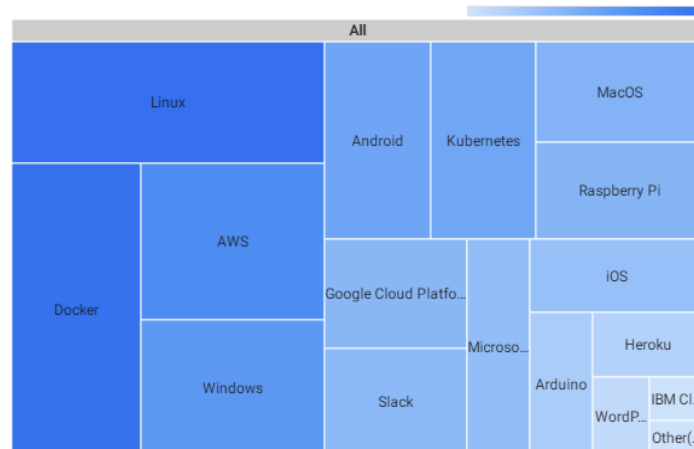
Top 10 Databases Desire Next Year

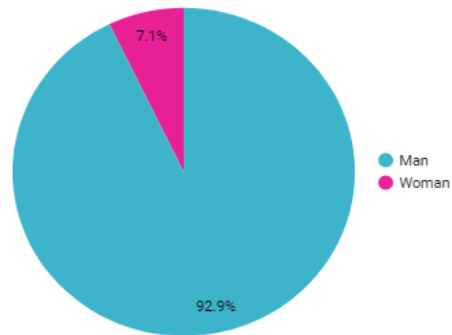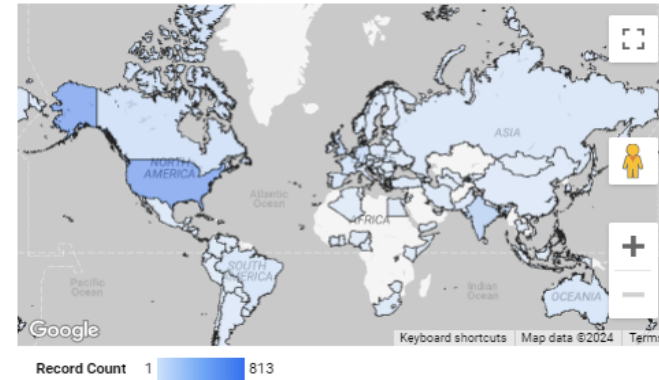**Platoform Desire Next Year**

Top 10 WebFrame Desire Next Year

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DASHBOARD TAB 3
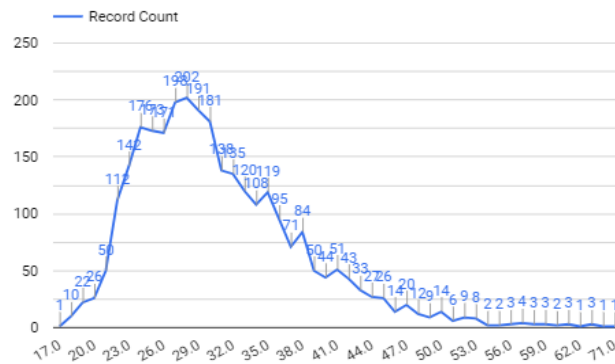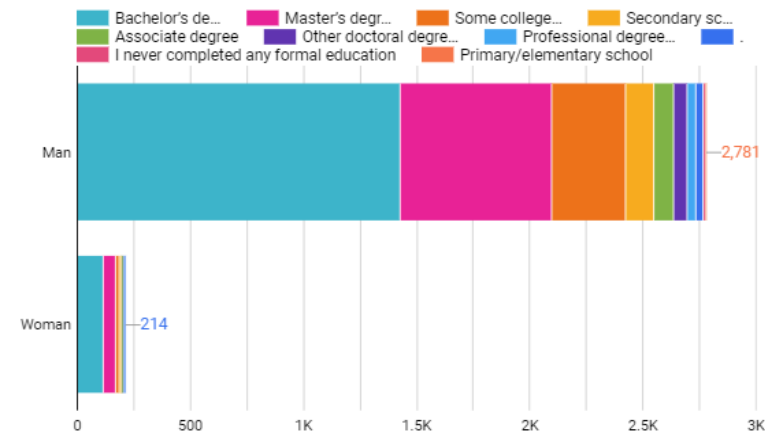
OVERALL FINDINGS & IMPLICATIONS

Findings

- 93% of Man participation

- USA as leading Country

- Few developers in Africa Continent

- Bachelor degree is the most relevant Education Level

- Linux, Windows, Docker and AWS on Top 4 for actual and next year

- Age concentration below 40

Implications

- Gender gap should be address as improvement point for further tech expansion

- Big techs in USA makes it a global developer center

- Colleague/university are key drivers for developers careers

- Main platform scenario seems to be stable

- There is room for tech expansion with people over 40

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DISCUSSION

- What should be done to reduce gender gap?
- What should be done to spread technology usage for 40+ years old people?
- What should be done to encourage tech developers around the world (specially in Africa)?
- Tech market is constantly changing. Analysis must be done on a regular basis
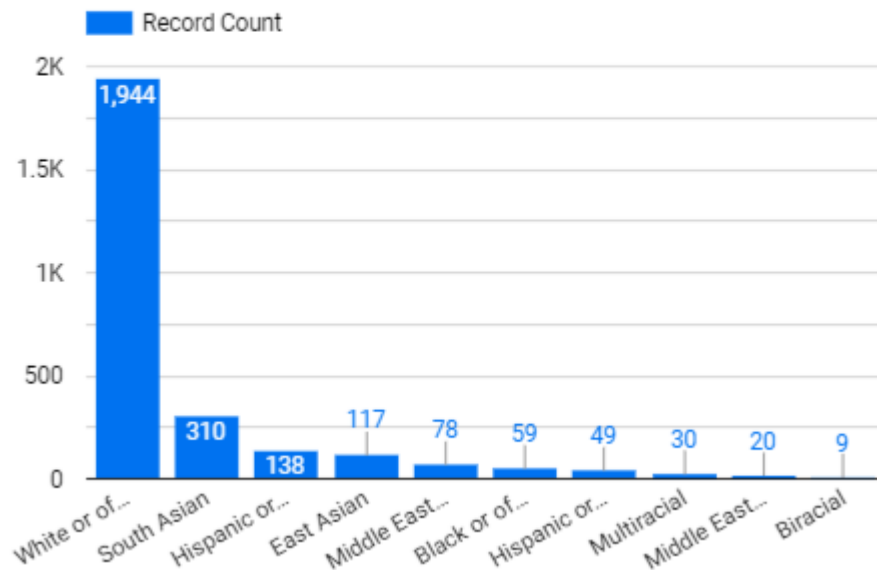
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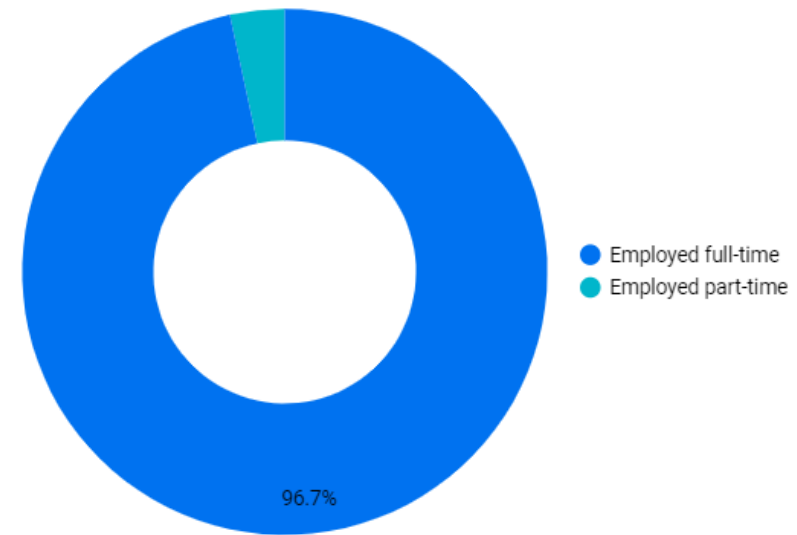SKILLS NETWORK

CONCLUSION

- Web development languages are the most common used and will remain main players in the future

- Gender gap and Age concentration can represent a risk/weakenss for the future

- Developers are centralized in USA as a global Tech Center

- AI and Machine Learning influences future perspectives (encouraging Python's applications)
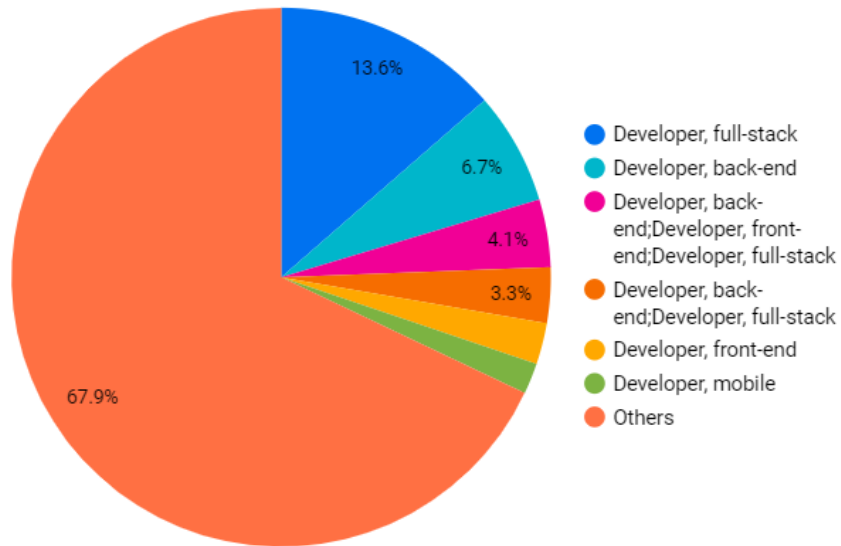
APPENDIX: Ethnicity and Work Contract

APPENDIX: Dev Types and Environment

Dev Types distribution

- Developer, full-stack — 13.6%
- Developer, back-end — 6.7%
- Developer, back-end;Developer, front-end;Developer, full-stack — 4.1%
- Developer, back-end;Developer, full-stack — 3.3%
- Developer, front-end
- Developer, mobile
- Others — 67.9%

Development Environment distribution

All

Visual Studio Code · IntelliJ · Vim · Sublime Text · Visual Studio · Notepad++ · Android Studio · Atom · IPython / Jupy... · PHPStorm · PyCharm · Eclipse · Xcode · Net... · Emacs · RSt... · Rub... · C...

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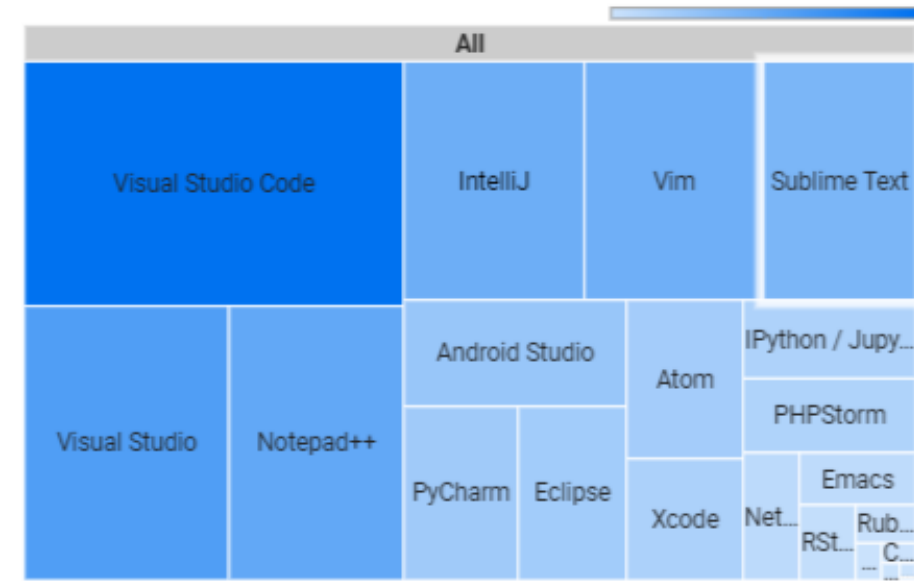
APPENDIX: Job Posting per Location

Jobs per Location

Location	Jobs
Washington DC	5316
Detroit	3945
Seattle	3375
New York	3226
Los Angeles	640
San Francisco	435
Austin	434
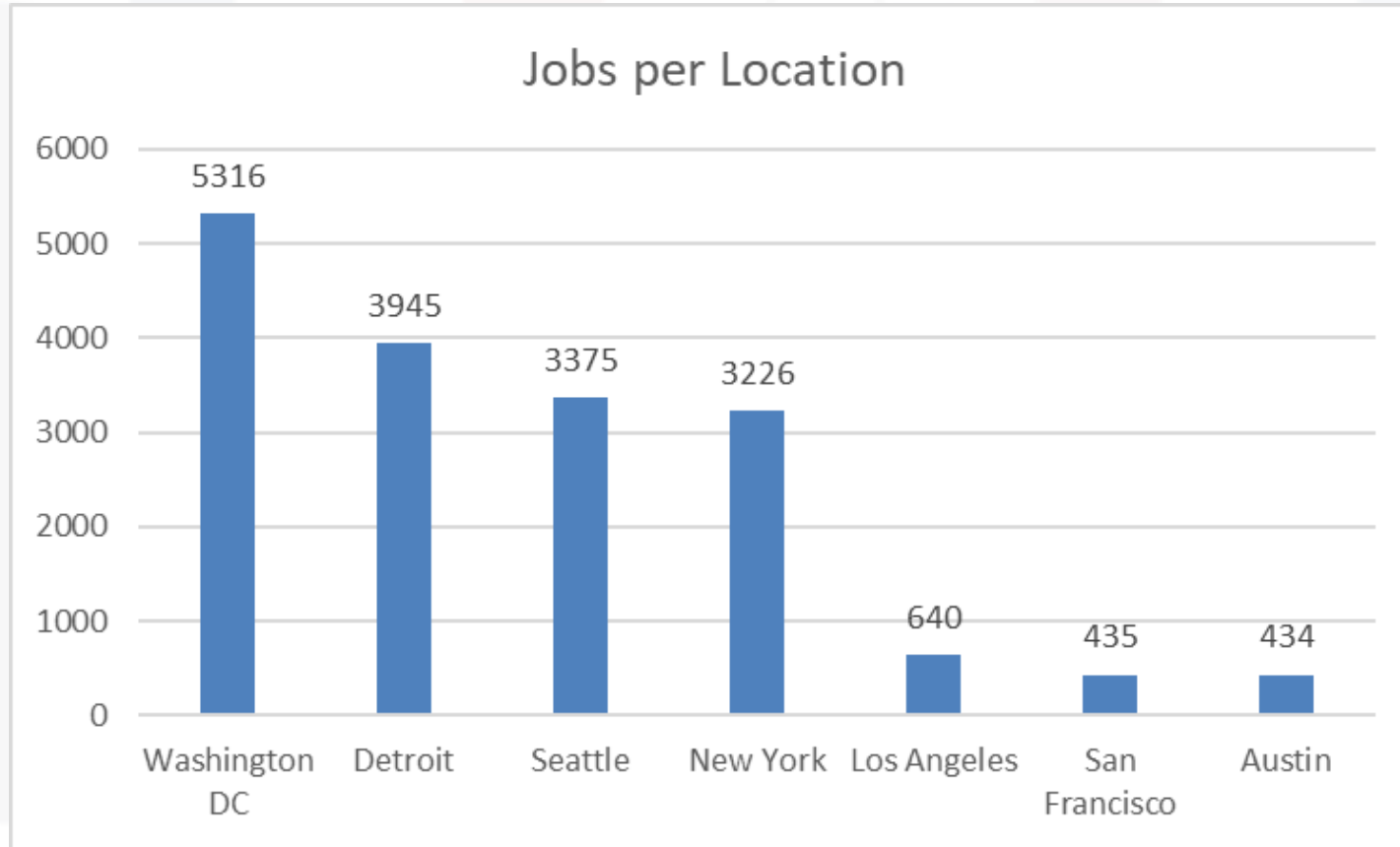
APPENDIX: Popular Languages Salary

Average Annual Salary

Language	Salary
Swift	R$ 130.801,00
Python	R$ 114.383,00
C++	R$ 113.865,00
Javascript	R$ 110.981,00
Java	R$ 101.013,00
Go	R$ 94.082,00
R	R$ 92.037,00
C#	R$ 88.726,00
SQL	R$ 84.793,00
PHP	R$ 84.727,00