Attracting Developers to Db2: Strategy, Progress, and Futures

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IBM Hybrid Cloud

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Why developers?

- **Developers have a high degree of influence over the purchase of technology products**
  - On a scale of **1** to **10**, over **50%** of **538** developers rated themselves a **9** or **10** in terms of having the ability to make software decisions at work
  - Because of their technical expertise, developers are often called upon to give advice on hardware and software purchases
- **Developers have purchasing power**
  - **58%** report that they are more a decision maker than a decision influencer in their companies
  - A majority of developers are authorized to spend more than **$1,000** without supervisor approval
  - **37%** are authorized to spend more than **$10,000**
- **Developers play a key role in the introduction of new technologies and products**
  - Developers are always looking for ways to solve common problems or see how new paradigms, like artificial intelligence (AI) and machine learning, can be used in their development efforts

Source: *Developer Marketing 2018*, Evans Data Corporation

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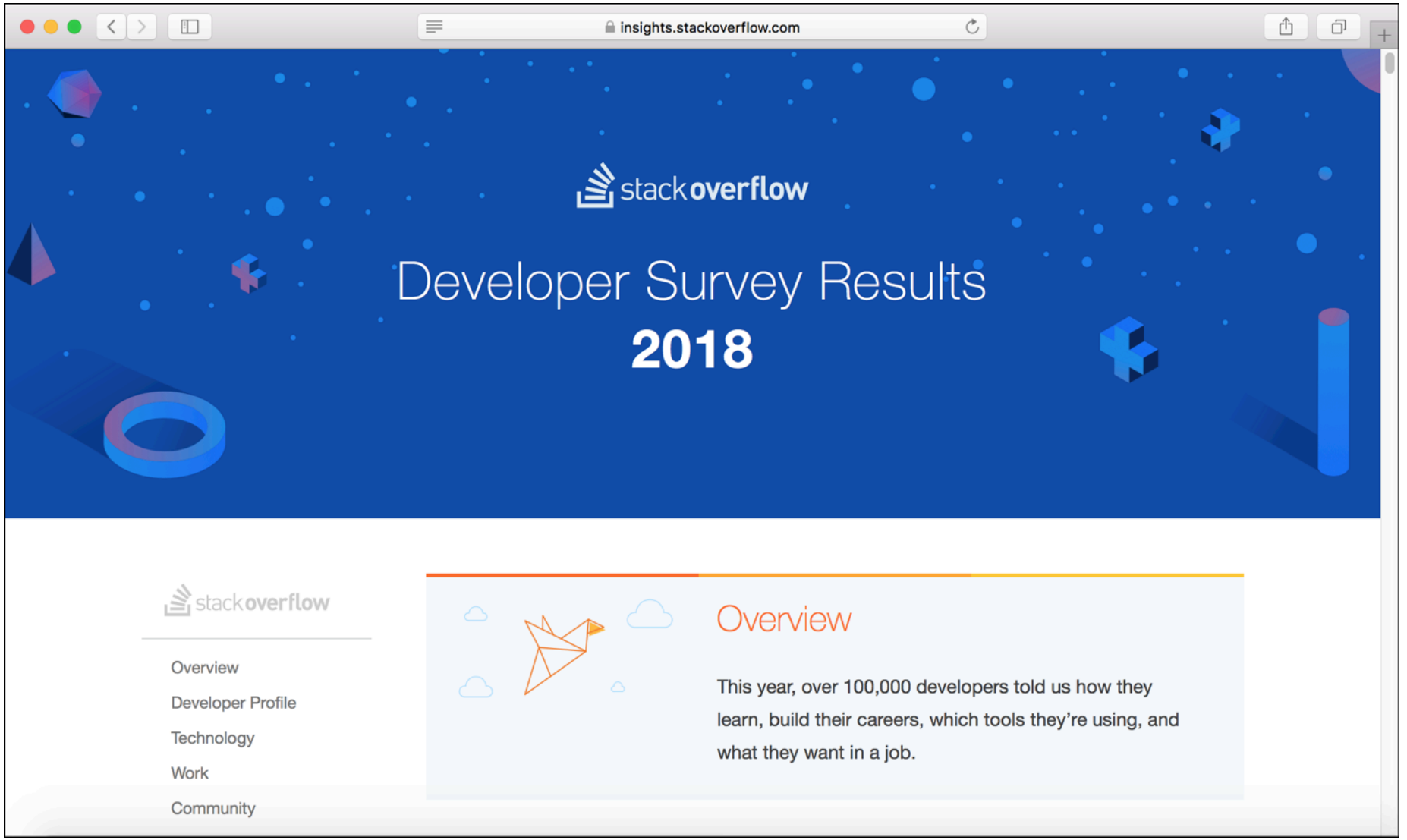
Who are developers?



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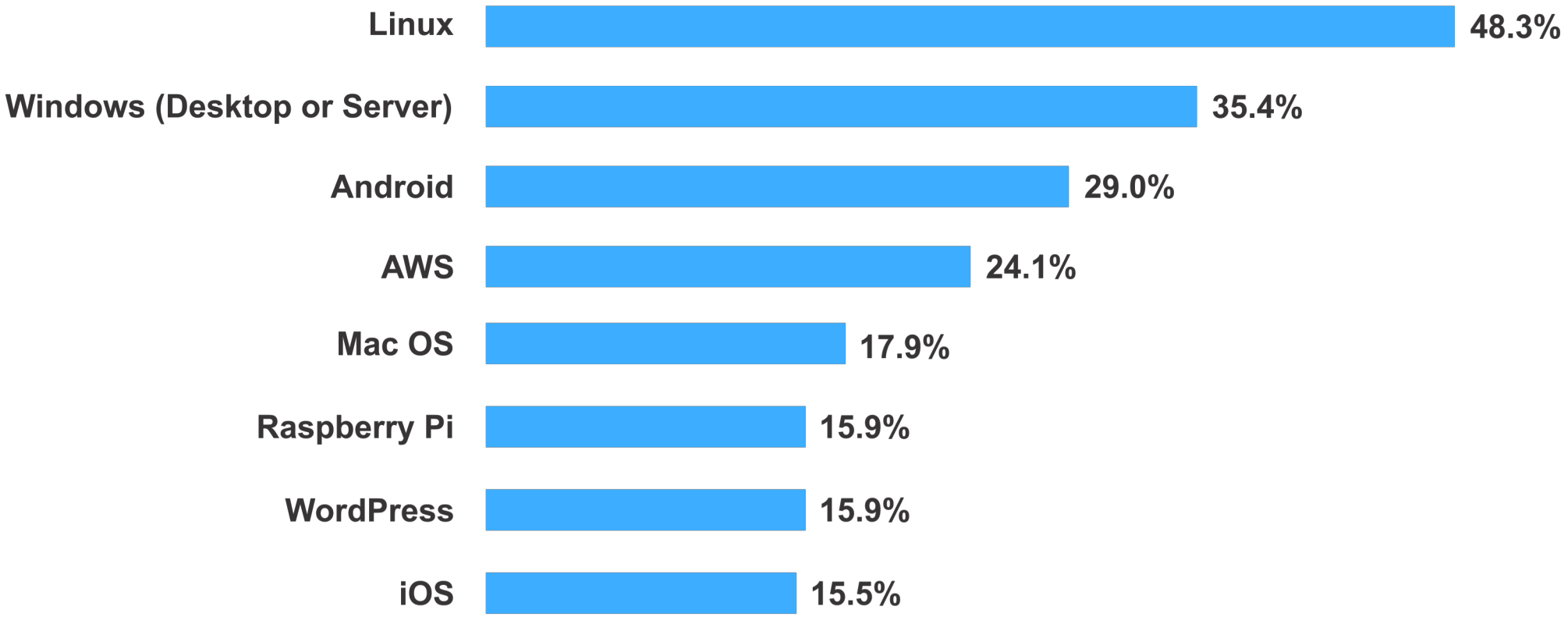
What platforms are developers using?



Source: Stack Overflow Developer Survey 2018
***65,999** responses; "Select all that apply."*

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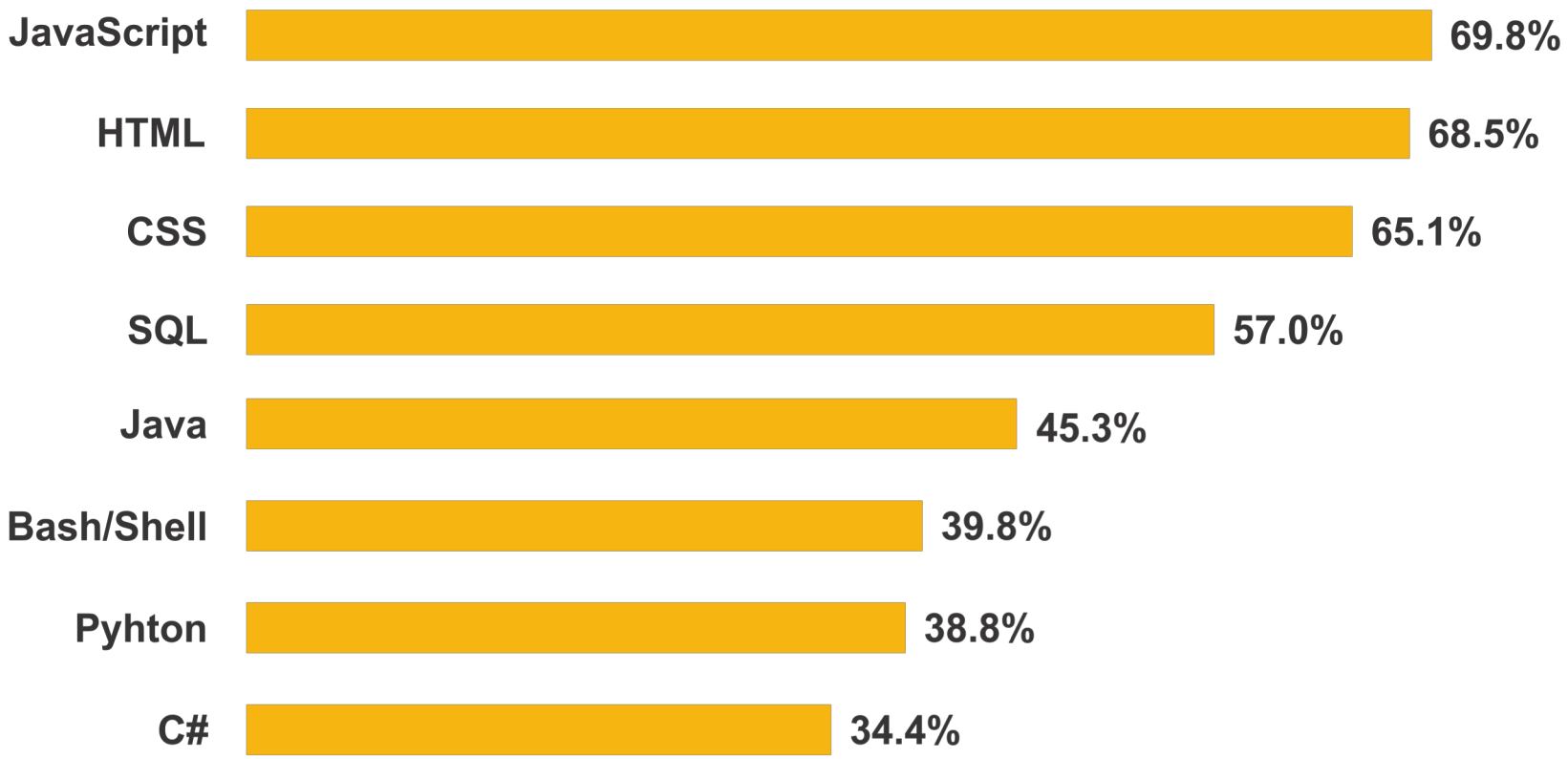
What programming languages are developers using?



Source: Stack Overflow Developer Survey 2018
***78,334** responses; "Select all that apply."*

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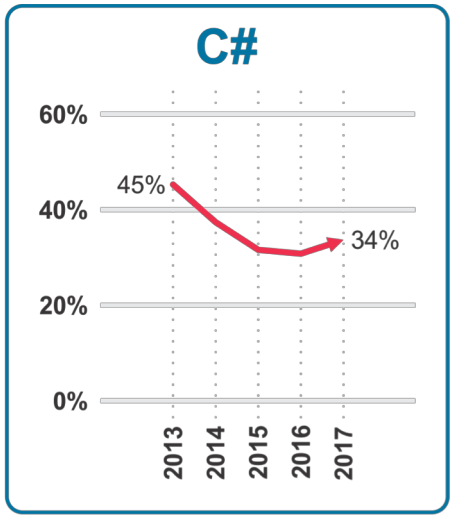
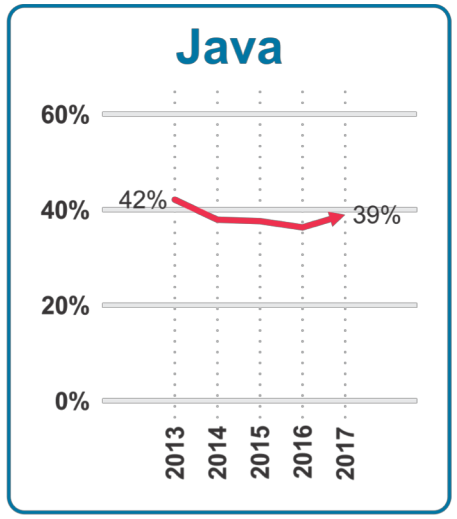
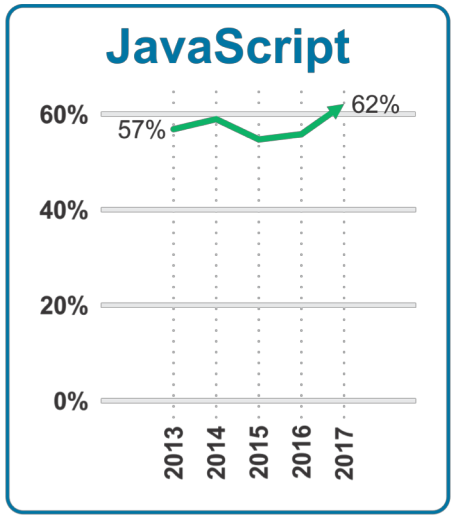
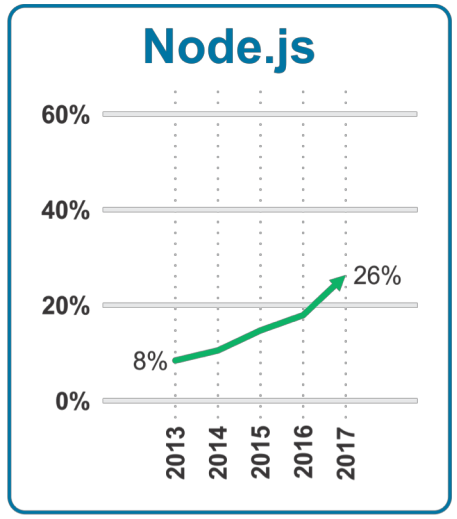
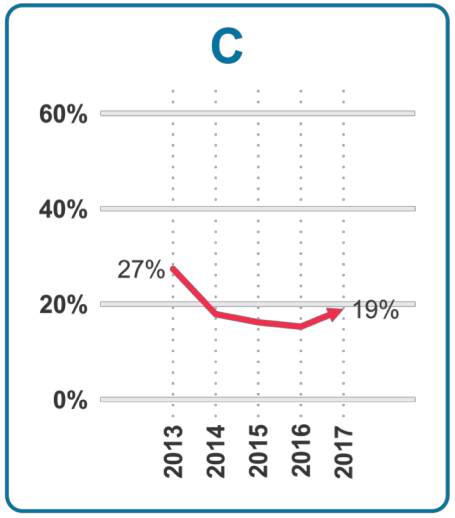
Change in programming language popularity over time

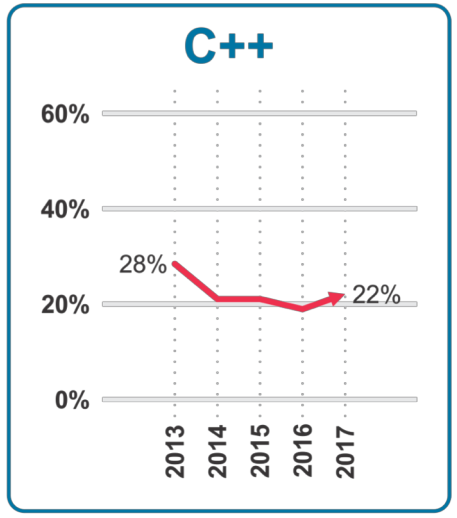


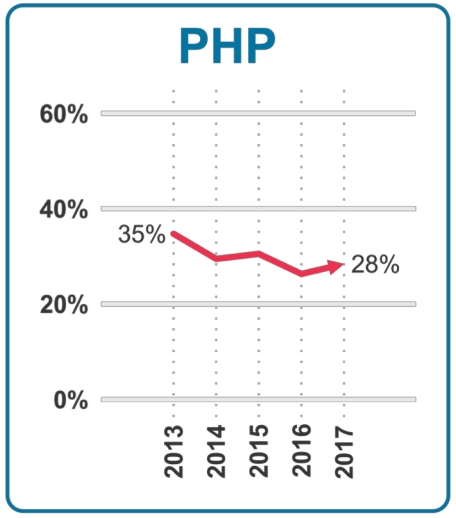


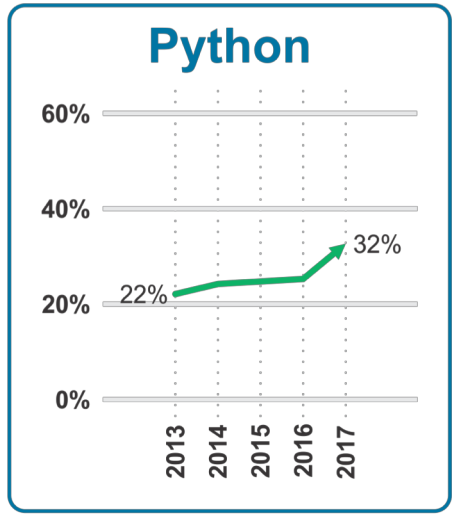












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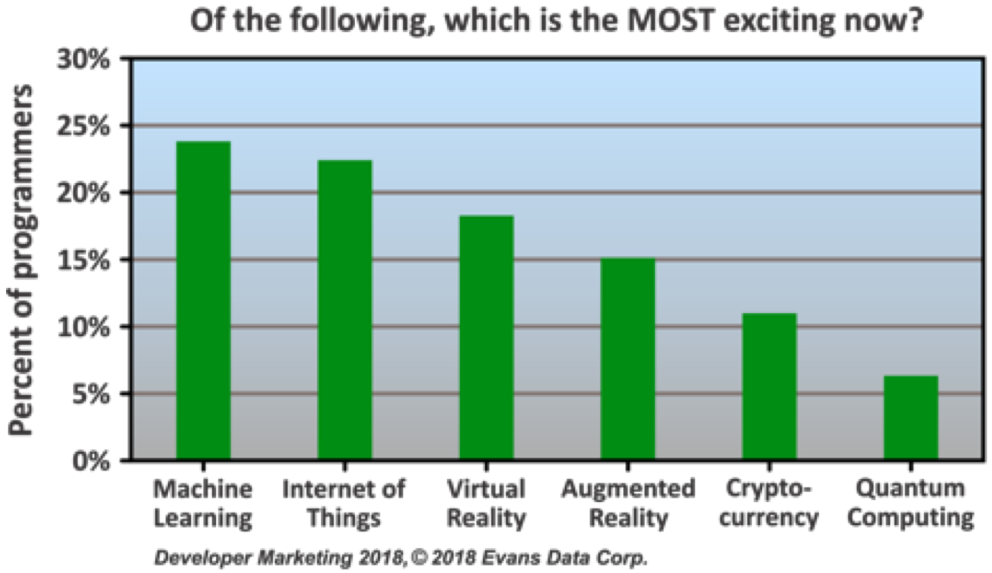
What excites developers today?

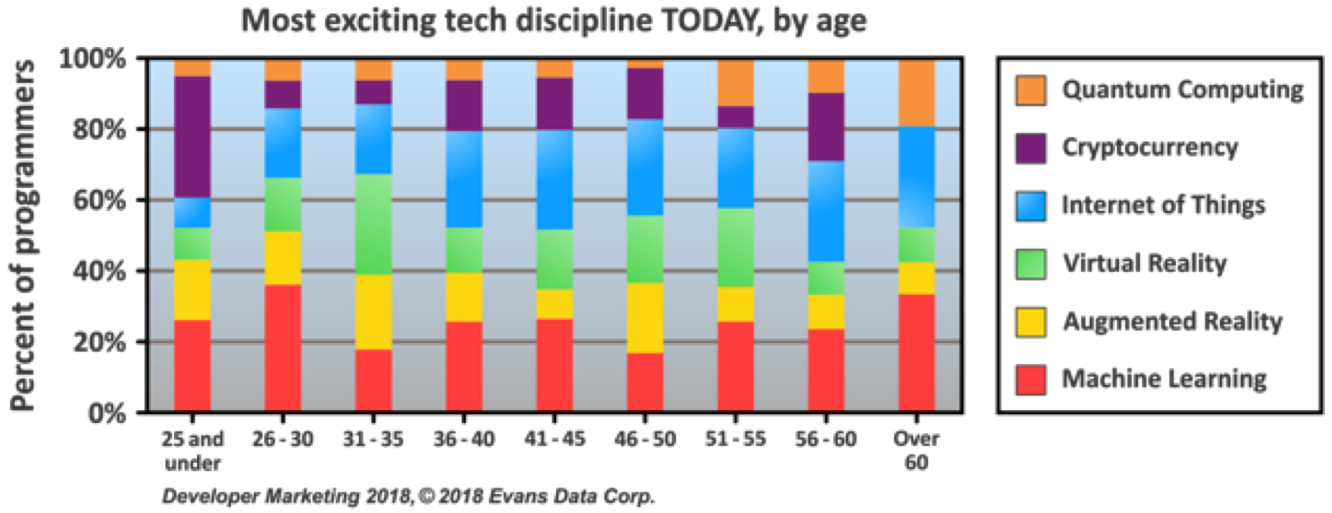


Developer Marketing Survey 2018

Evans Data Corporation EDC

Developer Outreach and Psychographics, © 2018 Evans Data Corp

Overall, machine learning (ML) and IoT are the most exciting tech disciplines today; however, younger developers are most excited about cryptocurrency



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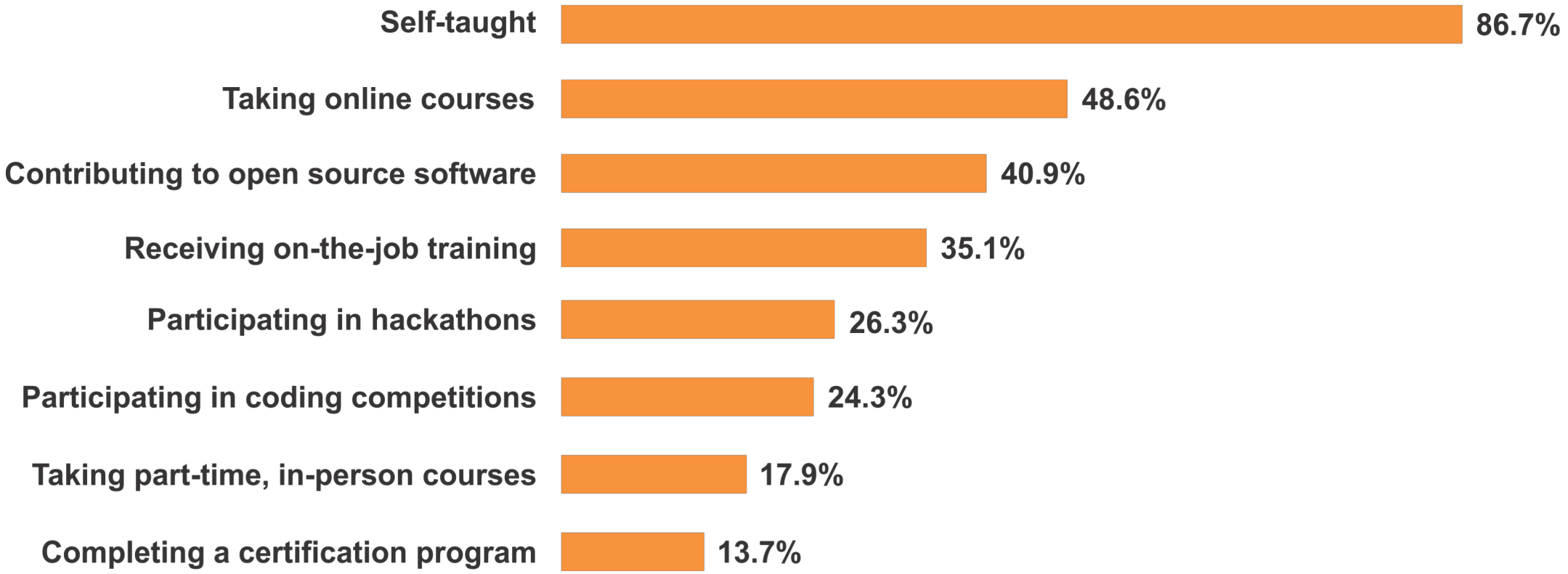
How do developers learn new technologies?



Source: Stack Overflow Developer Survey 2018
***67,960** responses; "Select all that apply."*

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Our objectives and areas of focus for attracting new developers

Objectives

- Increase developer adoption of Db2
- Modernize the Db2 developer experience
- Expand the ecosystem for Db2 – including skills
- Promote benefits of using Db2

Focus areas

- Improve user install experience
- Develop new technical collateral
- Launch an **IBM Db2 Community**
- Interact with third-party communities
- Launch a marketing campaign for developers

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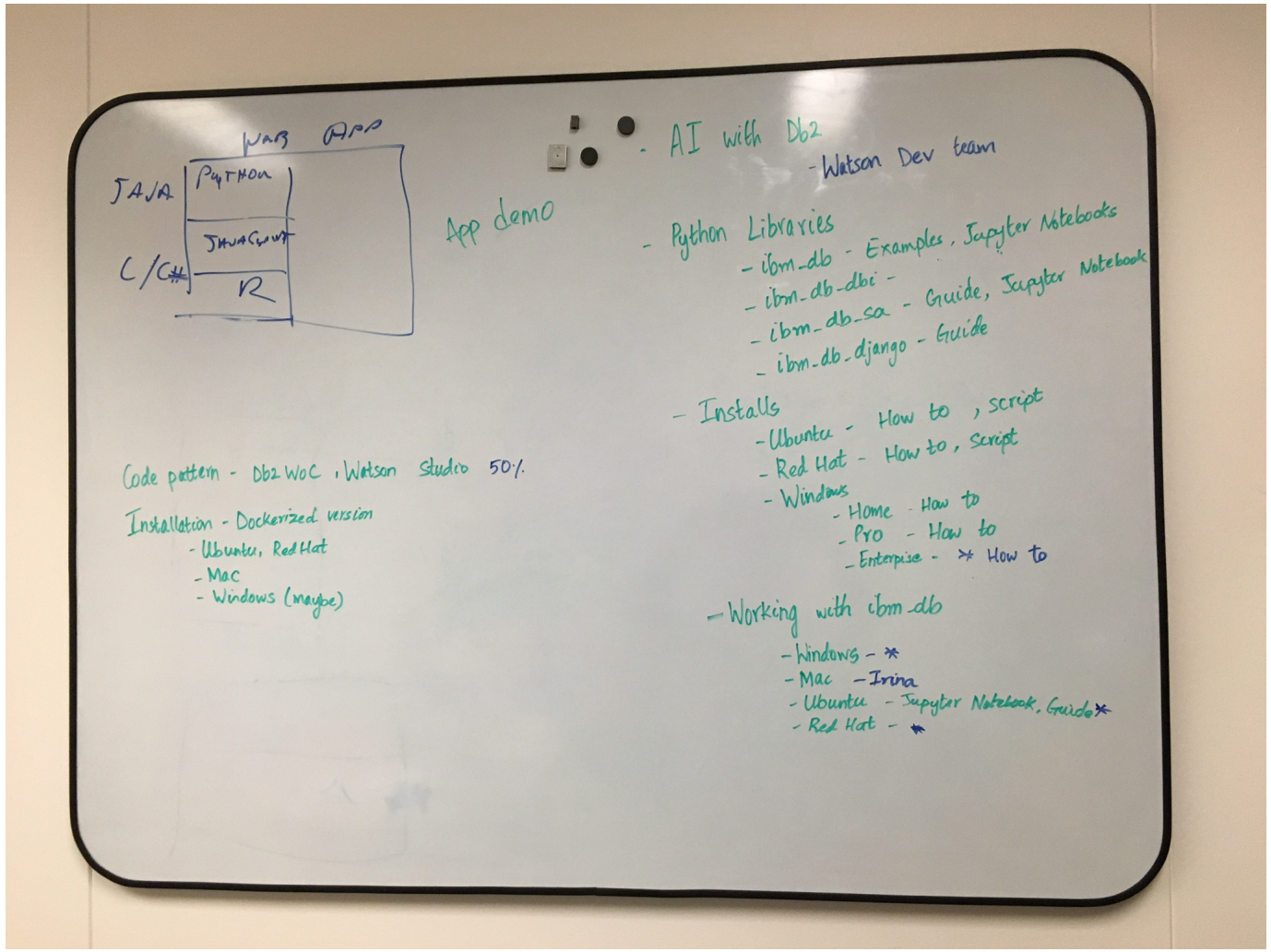
Summer intern help with roadmap execution



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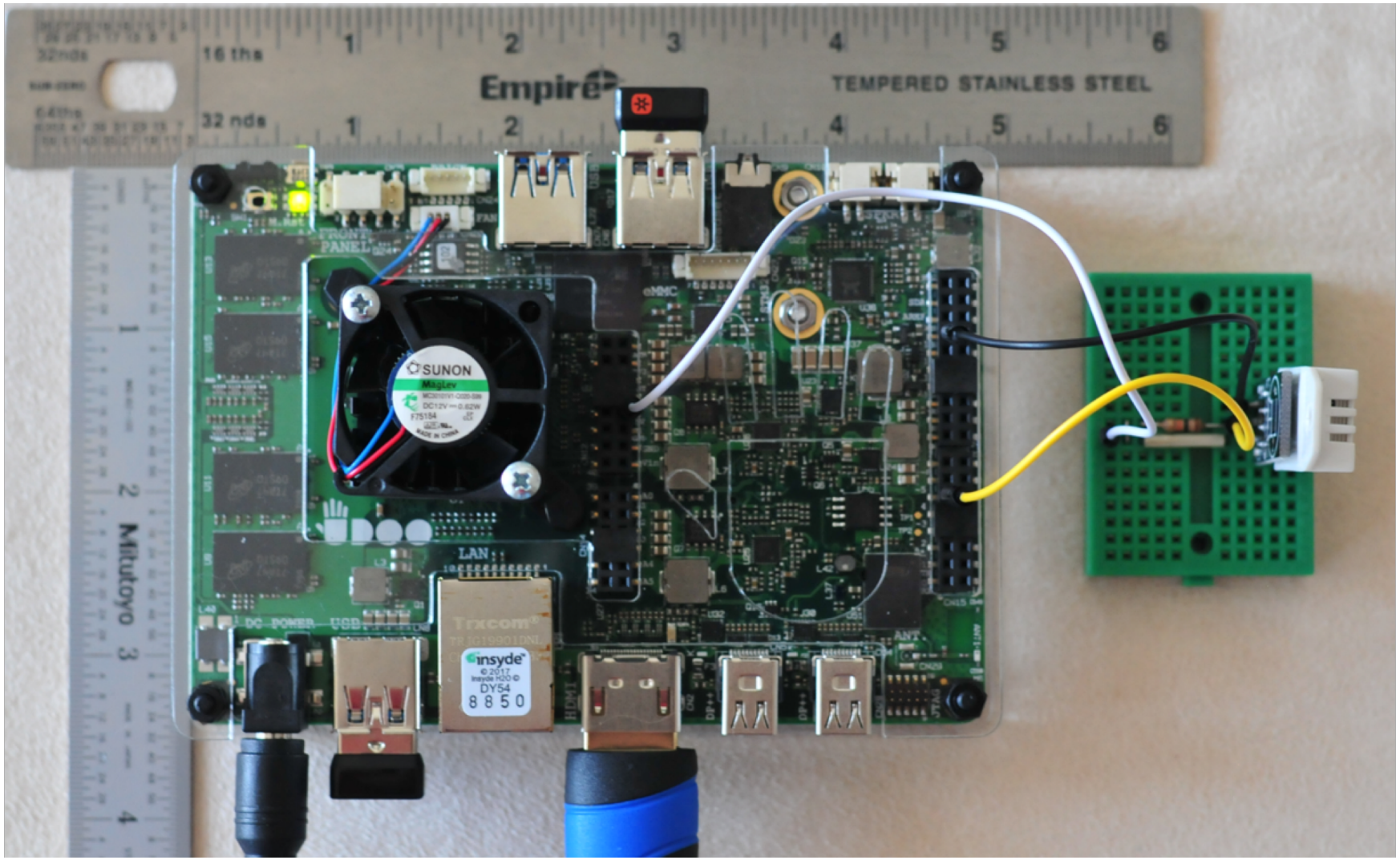
Computing environment used



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Initial work efforts

- ✓ Rework the **IBM Marketplace** web site to make it easier to get the different free versions of Db2 available (**Community Edition**, **Developer-C**, and the **Db2 on Cloud Free Tier**)
- ✓ Create a Db2 Developer-C install script for Ubuntu Linux
- ✓ Create a Db2 Developer-C install script for RedHat Linux
- ✓ Launch a new **IBM Db2 Community** website
- ✓ Change the **ibm_db** Python library version number from **2.0.8a** to **2.0.9**
- Develop Python 3.5 code examples that demonstrate how to use the **ibm_db** and **ibm_db_dbi** Python library APIs
- Create Jupyter Notebooks that document how to use the APIs in the **ibm_db** and **ibm_db_dbi** libraries

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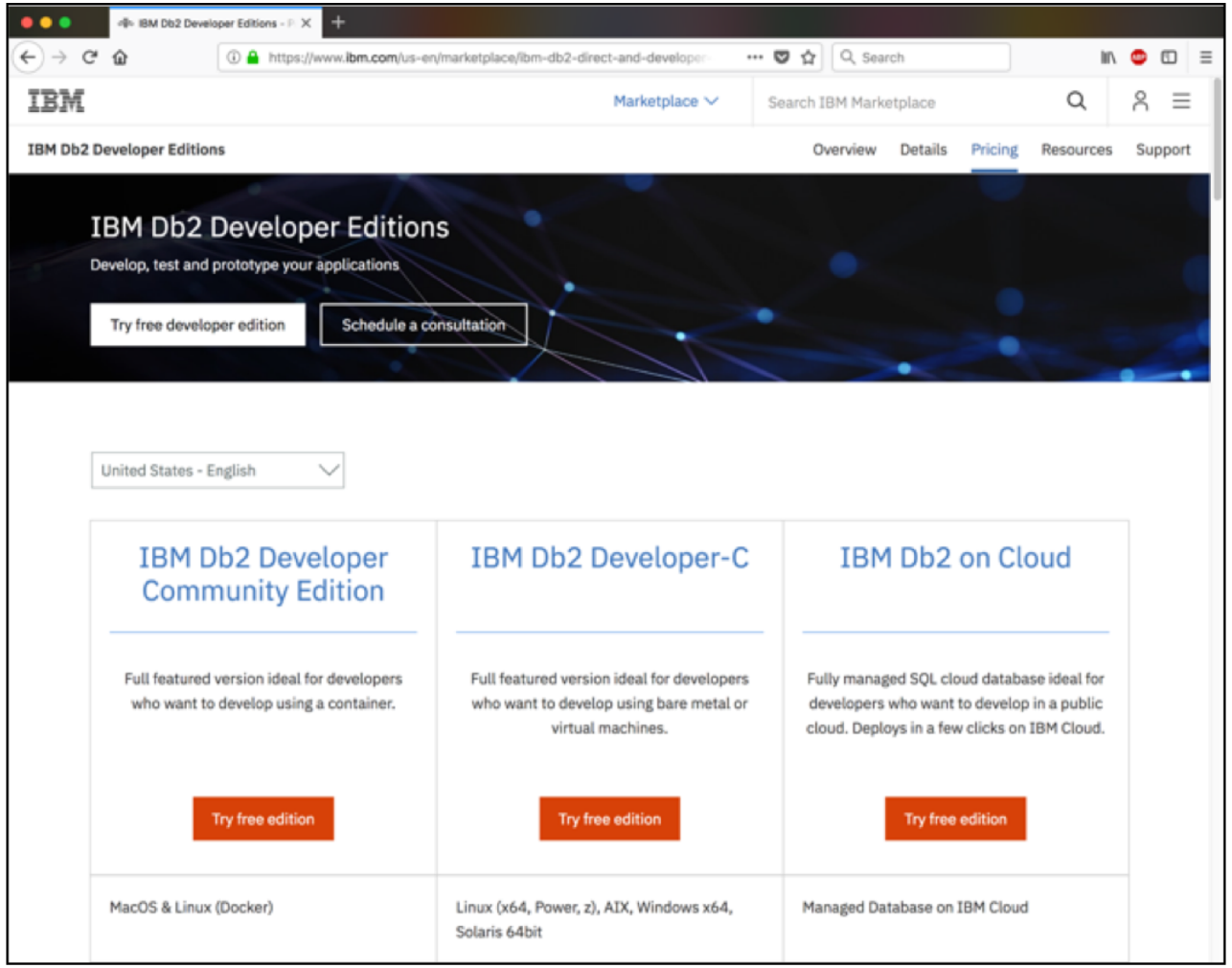
New IBM Marketplace download page for Db2 Developer Editions



https://www.ibm.com/us-en/marketplace/ibm-db2-direct-and-developer-editions

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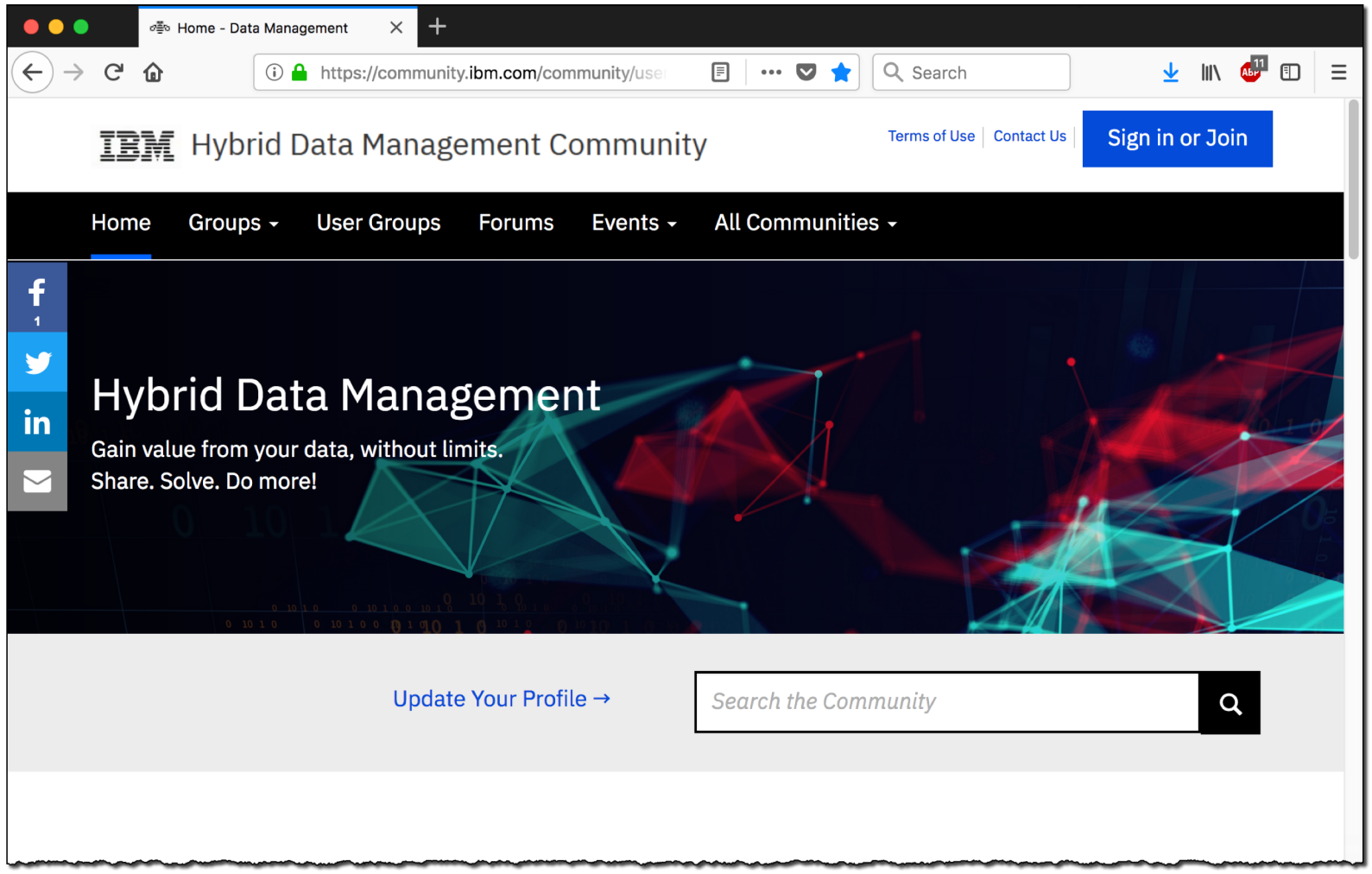
New IBM Db2 Community website



https://community.ibm.com/community/user/hybriddatamanagement/home

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New "How-To Guides" that aid in the installation and use of Db2

- ✓ Downloading, installing, and running **Db2 Developer-C on Ubuntu Linux**
- ✓ Downloading, installing, and running **Db2 Developer-C on RedHat** Linux (7.5)
- ✓ Downloading, installing, and running **Data Server Manager** (from a developer perspective)
- ✓ Downloading, installing, and running **Db2 Community Edition on Ububtu Linux**
- ✓ Downloading, installing, and running **Db2 Community Edition on RedHat Linux**
- Downloading, installing, and running **Db2 Developer-C on Windows 10 (Home, Professional, and Enterprise Edition)**
- Using the **ibm_db** library to develop Python applications with **Db2 Community Edition on Ubuntu Linux**
- Using the **ibm_db** library to develop Python applications with **Db2 Community Edition on RedHat Linux**
- How to set up and use the the **ibm_db_django** Python library
- How to set up and use the the **ibm_db_sa** Python library

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Using Db2 with Watson Studio "code patterns"

CODE PATTERN | OCT 22, 2018

Continuous learning with Watson Machine Learning and IBM Db2 Warehouse on Cloud

Get the Code »

Apache Spark

Artificial Intelligence +

CODE PATTERN | OCT 19, 2018

Train a cloud-based machine learning model using on-premise data

Get the Code »

Analytics

Artificial Intelligence +

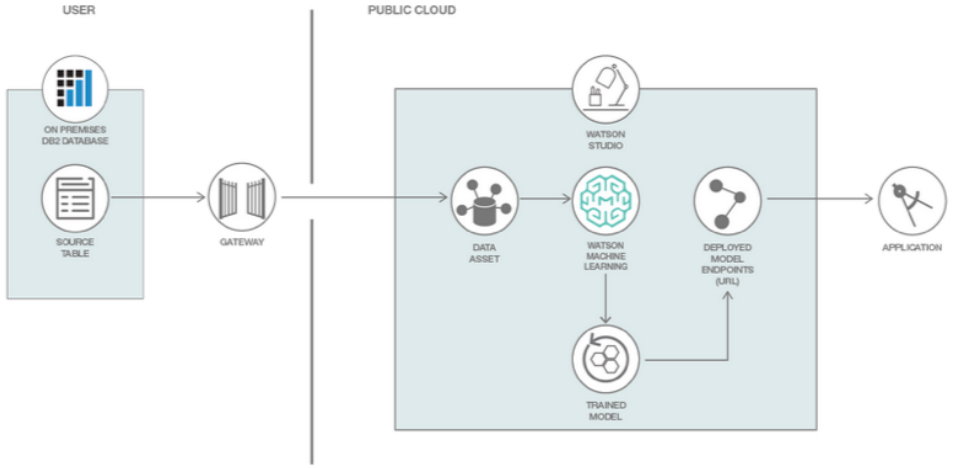
Train a cloud-based machine learning model from an on-premise database

build failing

Many companies and individuals struggle to use their on-premises data — the kind of data that lives on a local machine, within your data center, behind your firewall — for machine learning in the cloud. It can be challenging to find a quick, easy, and secure solution for connecting resources in a protected environment to resources in the cloud.

With Watson Studio & Machine Learning, Db2, and Secure Gateway, it is possible to establish a secure, persistent connection between your on-premises data and the cloud to train machine learning models leveraging cloud computing resources like Spark, elastic environments, and GPUs.

In this guide, we will create an on-premises Db2 database on our local computer, populate it, and then connect it to Watson Studio via Secure Gateway. Then, we'll read Buildings Violations data from this database and build a model to predict the likelihood that a particular building will FAIL an inspection based on historical data from the City of Chicago. After we build the model, we will deploy it as an API endpoint with Watson Machine Learning that only authorized users can access.



https://developer.ibm.com/announcements/training-machine-learning-models-in-watson-studio/

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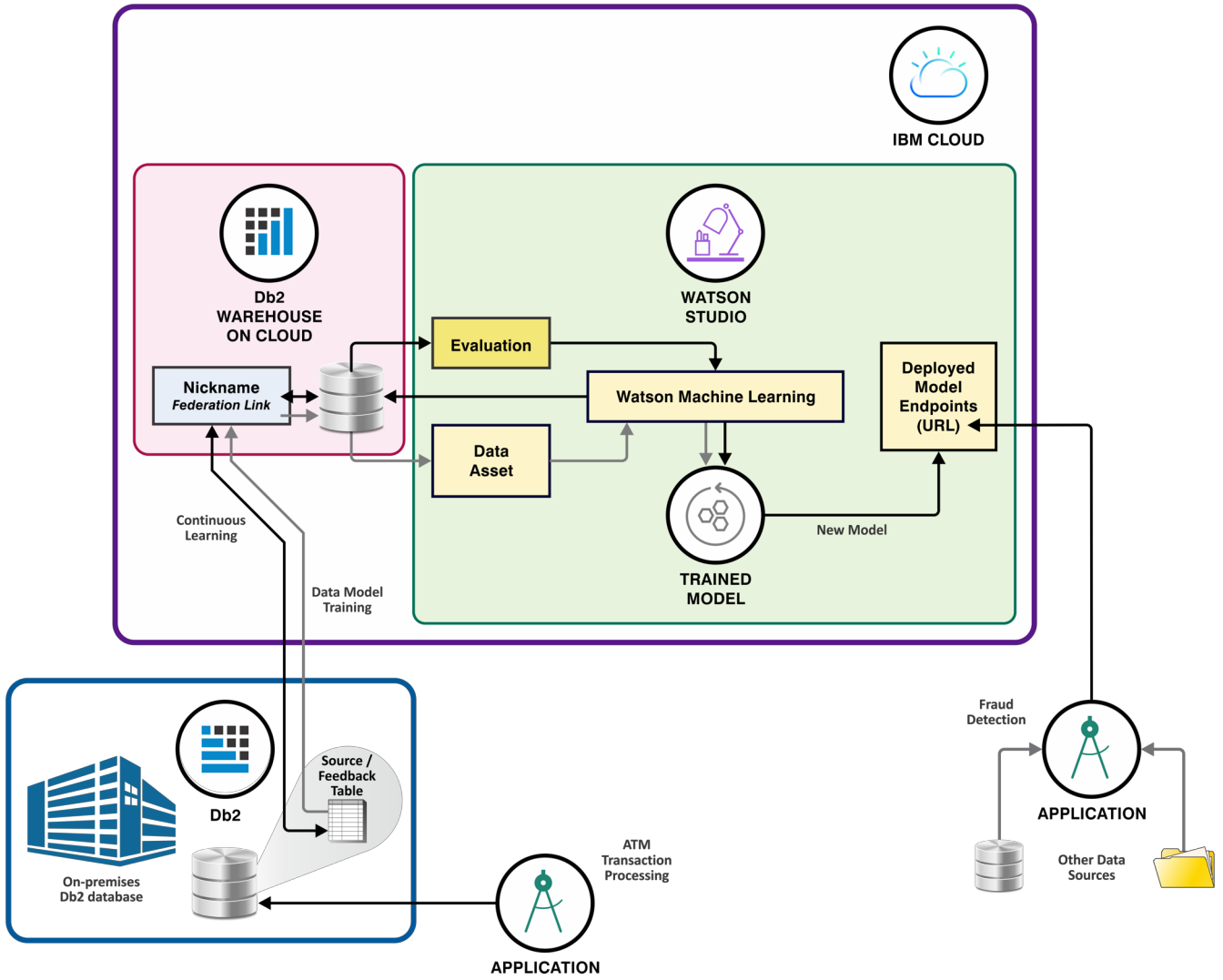
Db2 on-premises and Watson Studio continuous learning model



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Example Jupyter Notebook

ibm_db.execute()

Purpose

To execute an SQL statement that has been prepared by **ibm_db.prepare()**

Syntax

bool ibm_db.execute(IBM_DBStatement stmt [, tuple parameters])

Parameters

- **stmt:** A prepared SQL statement returned from **ibm_db.prepare()**.
- **parameters:** A tuple of input parameter values for each parameter marker used in the prepared SQL statement.

Return values

- **True:** Success
- **False:** Failure

Description

The **ibm_db.execute()** API is used to execute an SQL statement that has been prepared by the **ibm_db.prepare()** API. If the SQL statement returns a result set, (for example, a **SELECT** statement), a single row can be retrieved and stored in a tuple or dictionary using the using **ibm_db.fetch_tuple()** (tuple), **ibm_db.fetch_assoc()** (dictionary), or **ibm_db.fetch_both()**. Alternatively, **ibm_db.fetch_row()** can be used to move the result set pointer to each row in the result set and **ibm_db.result()** can be used to fetch a column from the current row.

Refer to **ibm_db.prepare()** for a brief discussion of the advantages of using **ibm_db.prepare()** and **ibm_db.execute()** instead of **ibm_db.exec_immediate()** to perform SQL operations against a Db2 database.

Example

In [1]:
```
#----------------------------------------------------------------------------------------------#
#  NAME:      ibm_db-execute.py                                                                #
#                                                                                              #
#  PURPOSE:  This program is designed to illustrate how to use the ibm_db.execute() API.      #
#----------------------------------------------------------------------------------------------#
```


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Stack Overflow support

Stack Overflow (https://stackoverflow.com) is a question and answer web site for professional and enthusiast programmers; it's built and run by application developers as part of the Stack Exchange network of Q&A sites.

According to the Stack Overflow 2018 Developer Survey, over **80%** of **57,354** respondents rely on Stack Overflow Q&A when learning something new.

Earlier this year, there were **8,165** questions that had been assigned the tag **db2** on Stack Overflow; however nearly 1/4 of those questions were unanswered!

On average, **100** new questions are entered each month; since May, our response rate has been approximately **70%**.

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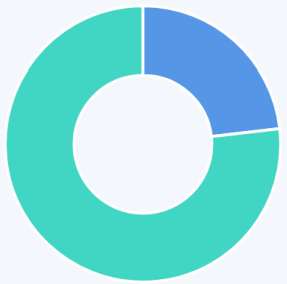
9.30.140.150

Search

Db2 Stack Overflow Metrics

Annual Trends

Questions Asked: 1078



Answered 76%

Unanswered 24%

Turnover Time

Average	**1 days, 11 hours, 19 minutes, 11 seconds**
Best	**0 days, 0 hours, 0 minutes, 21 seconds**
Worst	**220 days, 7 hours, 18 minutes, 59 seconds**

Answers: 828

Accepted 47%

Unaccepted 53%

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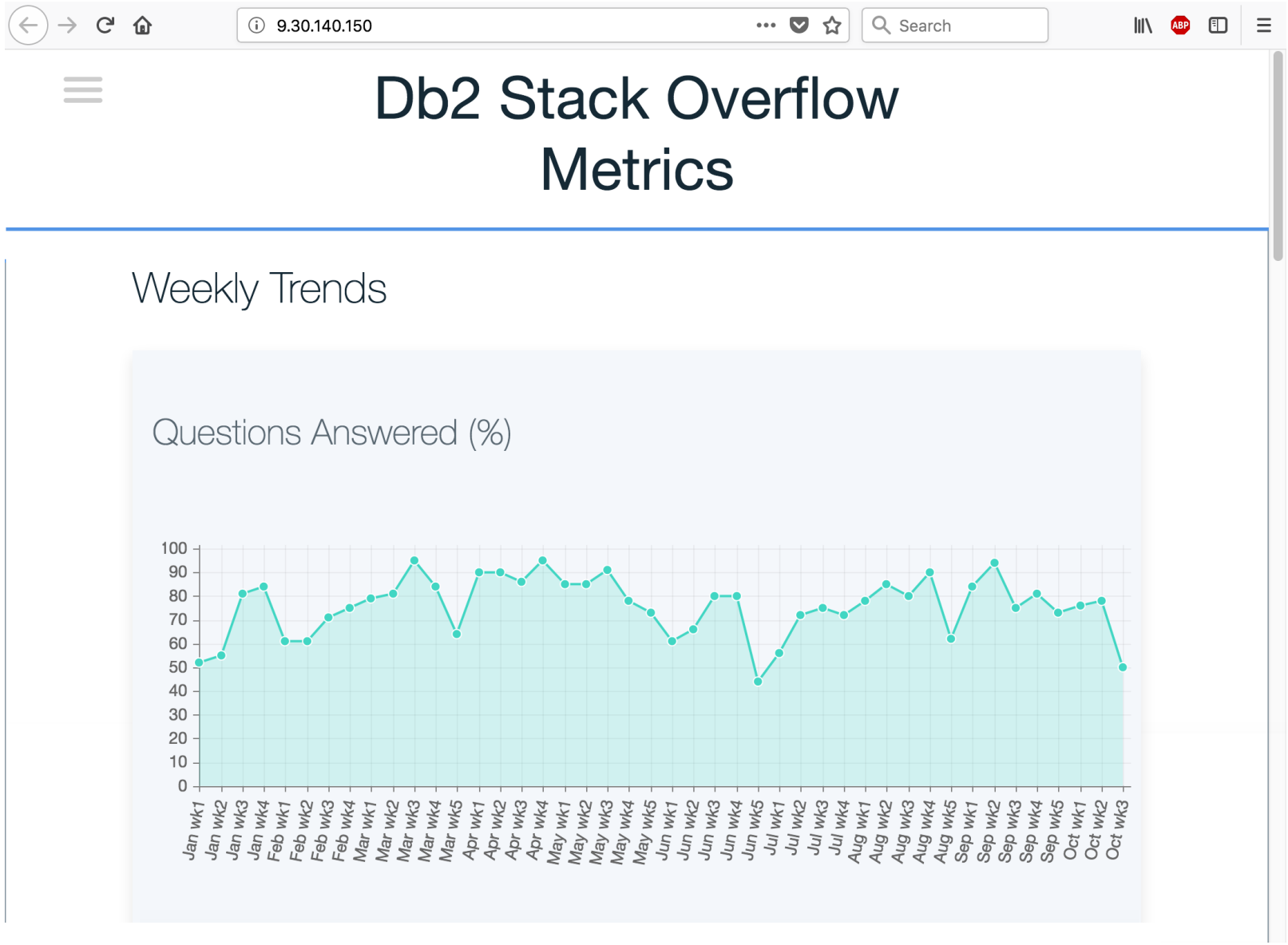

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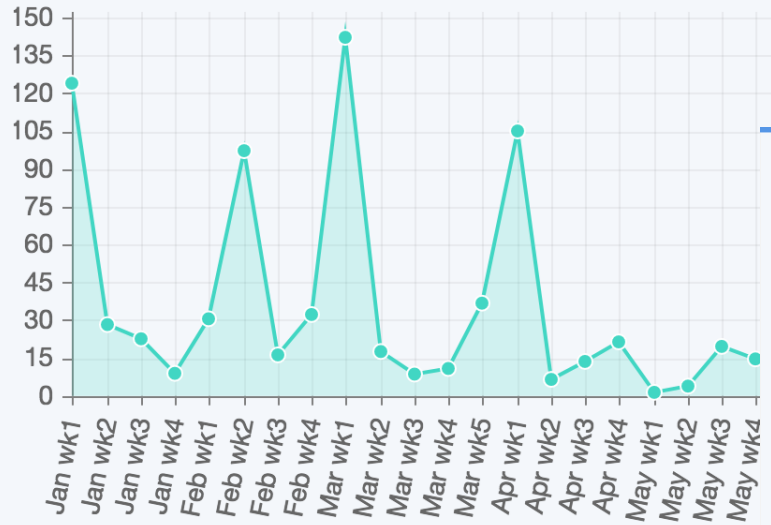
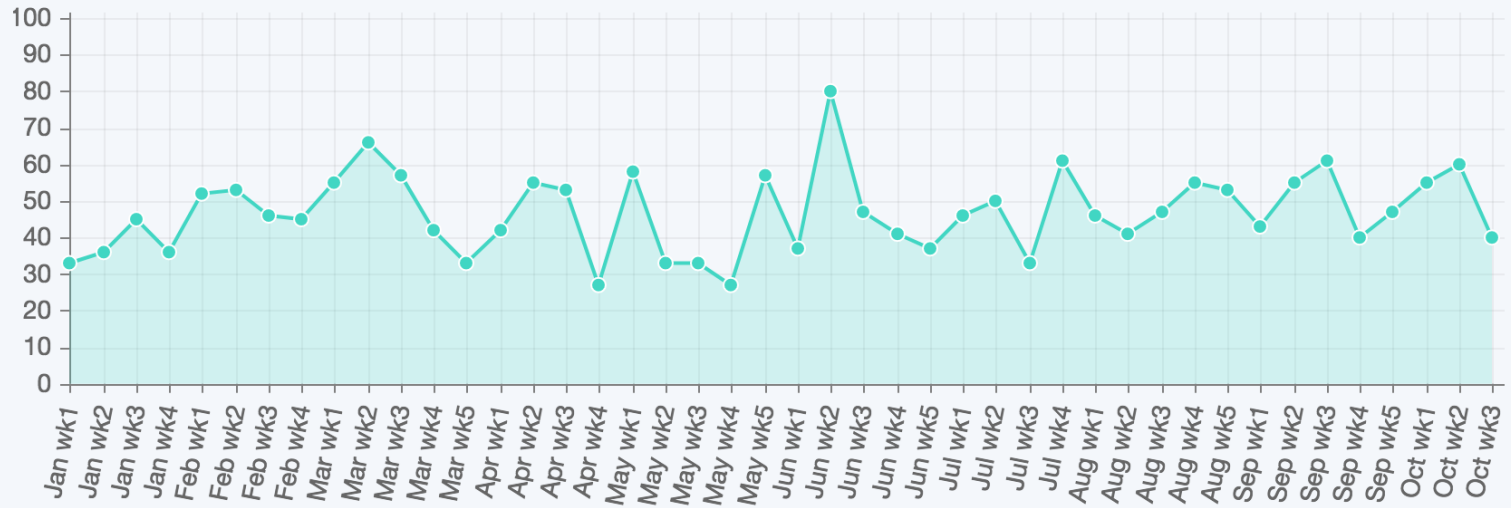
Average Question Turnaround (Hours)



Answers Accepted (%)



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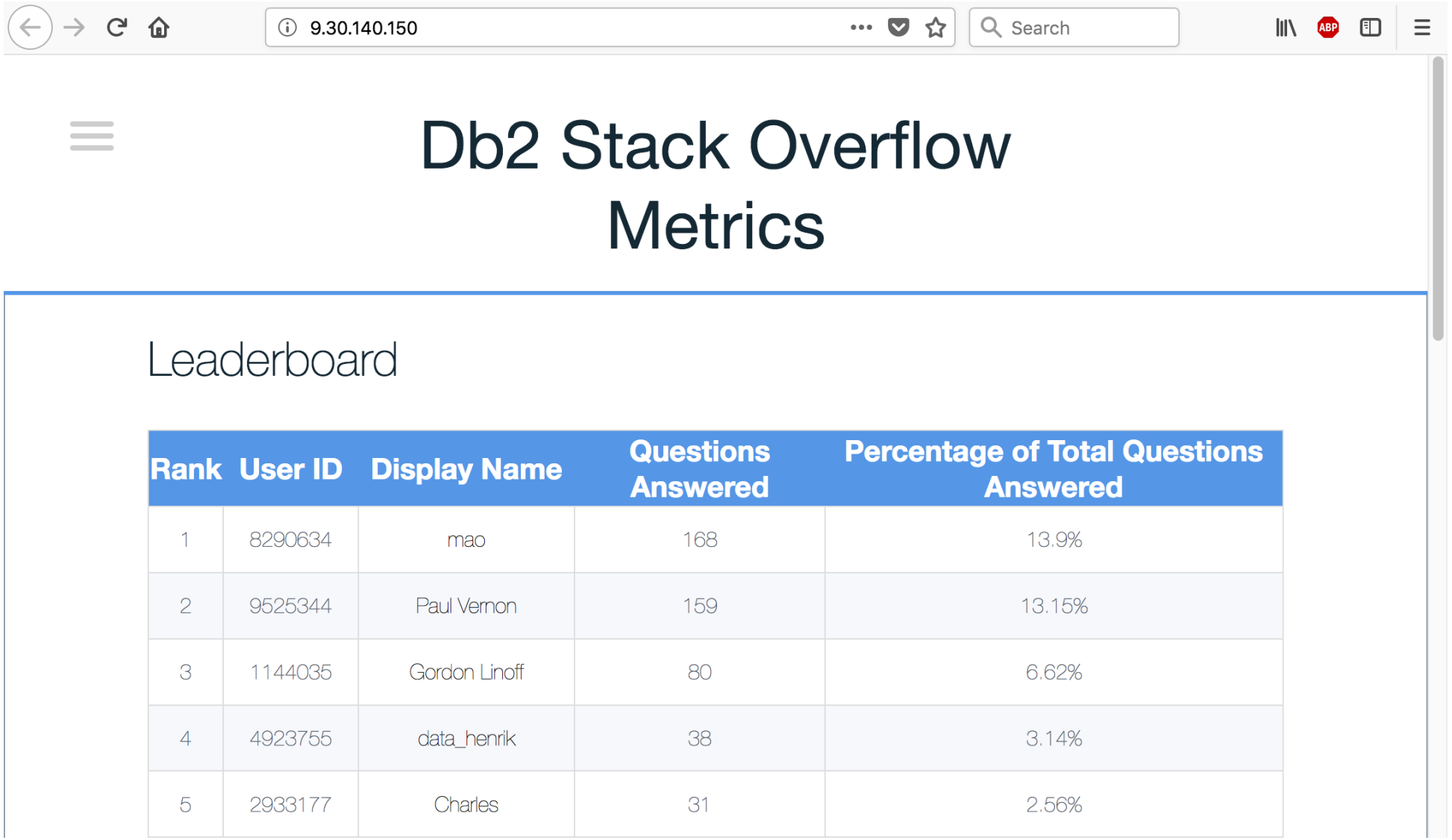

Rank	User ID	Display Name	Questions Answered	Percentage of Total Questions Answered
1	8290634	mao	168	13.9%
2	9525344	Paul Vernon	159	13.15%
3	1144035	Gordon Linoff	80	6.62%
4	4923755	data_henrik	38	3.14%
5	2933177	Charles	31	2.56%

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Next steps (in no particular order)

- Create e-mail nurture for marketing campaign activity
- Move all existing Db2 example programs to GitHub
- Create a series of Db2 "Hello World" example programs using modern programming languages (Ember Crooks)
- Improve Stack Overflow Db2 question response ratio; eliminate backlog of unanswered questions
- Produce "How to Guide" for Downloading, installing, and running Db2 Community Edition on Windows (Home, Professional, and Enterprise)
- Refresh and republish select IBM DeveloperWorks articles on **IBM Developer**
- Publish a custom ”Integrating Db2 with Python applications" book / ebook
- Db2 RDS on AWS

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Next steps (Continued)

- IBM Go Driver for Db2
- Create collateral (paper & video) showing usage of MacOS client (provided thru DS driver on Mac)
- Db2 11.x Developer-C (non-pureScale) marketplace availability on Azure
- Develop collateral (paper & video) that explains the process of using JavaScript with Db2
- Develop collateral (paper & video) that explains the process of using Node.js with Db2
- Db2 11.x (non-pureScale) availability on Google Cloud Platform
- Natural Language Query support
- JSON ANSI SQL support
- RESTful API support
- DS Driver - Native Linux Install (rpm, apt, etc.)

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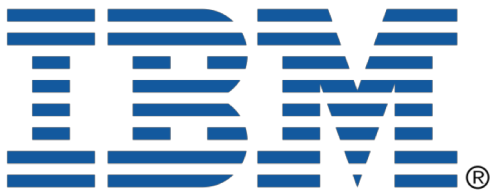

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