**Report**

**Trends in Technology: A Comparative Analysis of Present-Day Dominance and Future Popularity**

**Executive Summary**

The report is a comparative analysis of Present-Day dominance and future popularity. It is about various aspects of software developers covering topics like programming languages, development practices, frameworks, salaries, job preferences, demographic information, and job satisfaction. The major stakeholders are developers, tech Companies, Recruiters, Researchers, Analysts, Tech Enthusiasts, and Students. Datasets are collected from Kaggle. Two datasets were taken for analysis "m5\_survey\_data\_demographics.csv" and "m5\_survey\_data\_technologies\_normalised.csv." Jupyter Notebook is used to code the data. Before analysis data is cleaned by using some codes to avoid duplicates and missing numbers. After data cleaning, the next step is to showcase the five programming languages for the current and future years. At present JavaScript language is very popular but it is predicted Python will be taken up the first position. After that, database trends are shown, as their future predictability. It is concluded that as programming languages evolve rapidly, Python is positioned to become one of the best languages among IT professionals and developers due to its versatile applications, including web development, data analysis, and machine learning. Python is expected to play a significant role in the evolving IT industry, contributing to significant changes in the field.

Table of Contents

|  |  |
| --- | --- |
| **Topics discussed** | **Page number** |
| Executive Summary |  |
| Introduction |  |
| Methodology |  |
| Functions to Clean Data |  |
| Top 5 Programming languages for the current year |  |
| Top 5 Programming languages for the current year |  |
| Programming languages Trends-Findings and Implications |  |
| Top 10 Programming languages for the current year |  |
| Top 10 Programming languages for the future year |  |
| Database Trends-Findings and Implications |  |
| Discussions |  |
| Conclusions |  |

**Introduction**

The report focuses on analyzing the present-day trends and usage of programming languages, comparing them with their past popularity. According to the 2019 Stack Overflow Developer Survey, Python emerged as the most popular programming language, followed by Java in the second position.

This report is about various aspects of software developers and their experiences in the tech industry. It covers topics like programming languages, development practices, frameworks, salaries, job preferences, demographic information, and job satisfaction. The report is for developers, tech Companies, Recruiters, Researchers, Analysts, Tech Enthusiasts, and Students.

By reading through this report, a reader can gain industry insights, career guidance, community knowledge, Benchmarking, and data-driven decision-making.

**Methodology**

To ensure a thorough analysis and accurate results, the following steps were undertaken:

Datasets are collected from Kaggle, the world's largest data science platform, which offers powerful resources to help achieve goals. The data was collected by downloading directly from the Kaggle account, and web scraping was used to extract additional data.

Data Collection using Web Scraping: Initially, necessary libraries were imported into Jupyter Notebook. The 'requests' and 'csv' files were imported to download web pages for further analysis. Web scraping was employed to gather data on language names and their corresponding annual average salaries. The code used for web scraping is provided in the image below. A detailed explanation of the web scraping process is given to demonstrate how the data was collected.

A screenshot of a computer

Description automatically generated

**Data Wrangling**

Two datasets were utilized to support the findings and analysis: "[m5\_survey\_data\_demographics.csv](https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/LargeData/m5_survey_data_demographics.csv)" and "[m5\_survey\_data\_technologies\_normalised.csv](https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DA0321EN-SkillsNetwork/LargeData/m5_survey_data_technologies_normalised.csv)." Both datasets are in CSV format. The demographics dataset includes information about respondents' occupation, employment level, country of origin, education level, years of coding experience, work location, age, gender, and sexuality. The technologies dataset contains information on the languages respondents have worked with, languages they desire to work within the next year, platforms they have worked with and desire to work within the next year, and web frameworks worked with and desire to work within the next year.

Before conducting the final analysis, both datasets were cleaned. The following steps were performed to handle duplicates and missing values:

* Duplicates were identified and removed.
* Missing values were located, and imputation techniques were applied to fill in the gaps.

With these steps in place, the analysis was carried out to gain meaningful insights into the trends and usage patterns of programming languages.

|  |  |
| --- | --- |
| **Data Wrangling criteria** | **Functions used** |
| Finding duplicates | df.duplicated().sum() |
| Removing duplicates | df\_new=df.drop\_duplicates()  df\_new.shape |
| Finding Missing values | df\_new.isnull().sum()  df\_new[‘WorkLoc’].isnull().sum() |
| Imputing missing values | df\_new[‘workLoc’].value\_counts()  df\_new[‘WorkLoc’].isnull().sum() # verify if imputing was successful. |

**Findings and implications**

The top 5 programming languages for the current year and future years

**Current technology usage**

A graph of a graph with text

Description automatically generated

**Future technology trend**

A screenshot of a graph

Description automatically generated

**Programming Languages Trends-Findings and Implications slides.**

The table shows top five programming languages for the current and future year. The current year shows that the JavaScript has huge demand among the developers. It is the most popular language that most people prefer in the recent year. The second most popular is HTML/ CSS languages. Python is the fourth desire of language.

However, the future predicts something different scenario. It is predicted that Python will be the second most popular language while JavaScript remains the same. HTML has taken up the third position.

**Top 10 databases for the current year and future years.**

Current year

A screenshot of a computer

Description automatically generated

Future

A graph of data being used

Description automatically generated

**Database Trends-Findings and Implications**

The figure above shows the top 10 databases for the current and future year. Currently, people prefer MySQL where 4000 respondents used it while Microsoft SQL possess the second position with 3000. On the other hand, it is predicted that in the future people will prefer PostgreSQL and the second will be MongoDB.

**Discussion**

It was analyzed that Python is one of the fastest-growing major programming languages, indicating that people will likely consider Python as their desired programming language in the future. Python is known for its ease of understanding, and respondents in the survey admitted that they found it easier to solve coding problems in Python compared to other languages. As programming languages evolve rapidly, Python is positioned to become one of the best languages among IT professionals and developers due to its versatile applications, including web development, data analysis, and machine learning.

**Conclusion**

In conclusion, it can be said that the field of programming languages is experiencing a fast pace of change. Each programming language has its unique syntax and coding style, setting it apart from others. Python shows promising prospects for the future. People seek user-friendly and secure software that can save them time, and Python's ease of use and versatility align with these preferences. As a result, Python is expected to play a significant role in the evolving IT industry, contributing to significant changes in the field.