DICHI
ACADEMY

Dichi Academy
Data Science Module 1 - Data with Python

Introduction to Python Programming Language

Table of Content

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About the Trainer

2022 - Present : PhD Student
Université Grenoble Alpes, France

2019 – Present : Lecturer and Researcher
Cambodia Academy of Digital Technology

2018 – 2019 : Master of Science in Informatics – Data Science
Grenoble INP & Université Grenoble Alpes, France

2013 – 2018 : Bachelor of Engineering in Information and Communication
Institute of Technology of Cambodia

2013 – 2017 : Bachelor of Education in English,
Institute of Foreign Languages, Royal University of Phnom Penh

How about you?

1. What is your name?
1. Are you currently an employee or a student?
1. What is your professional/academic background?
1. What is your primary purpose of joining this training course?

About the Data Science

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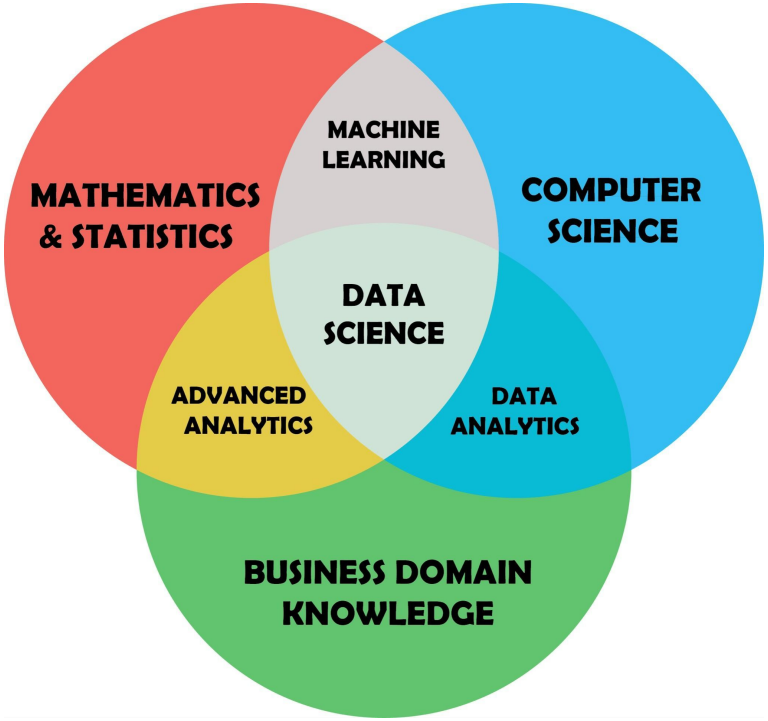

About the Data Science

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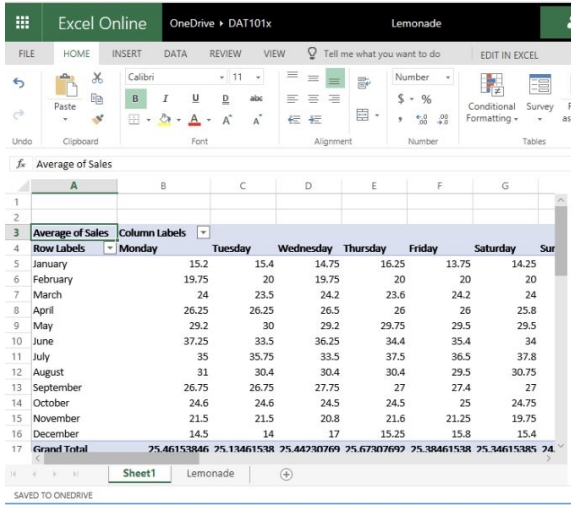
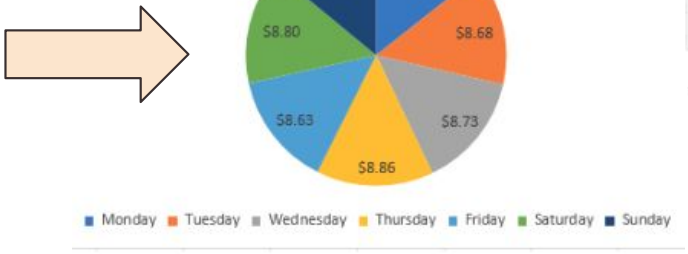
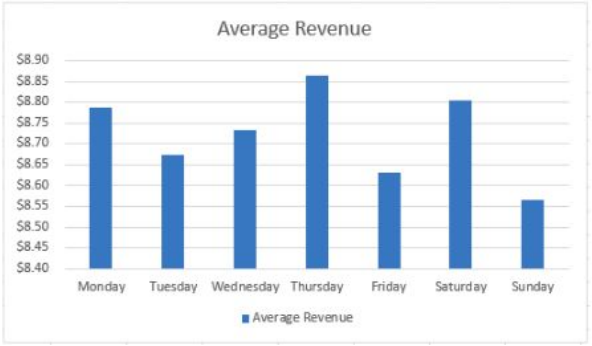


Average of Sales	Column Labels						
Row Labels	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sun
January	15.2	15.4	14.75	16.25	13.75	14.25	
February	19.75	20	19.75	20	20	20	
March	24	23.5	24.2	23.6	24.2	24	
April	26.25	26.25	26.5	26	26	25.8	
May	29.2	30	29.2	29.75	29.5	29.5	
June	37.25	33.5	36.25	34.4	35.4	34	
July	35	35.75	33.5	37.5	36.5	37.8	
August	31	30.4	30.4	30.4	29.5	30.75	
September	26.75	26.75	27.75	27	27.4	27	
October	24.6	24.6	24.5	24.5	25	24.75	
November	21.5	21.5	20.8	21.6	21.25	19.75	
December	14.5	14	17	15.25	15.8	15.4	
Grand Total	25.46153846	25.13461538	25.44230769	25.67307692	25.38461538	25.34615385	24.





About the Data Science

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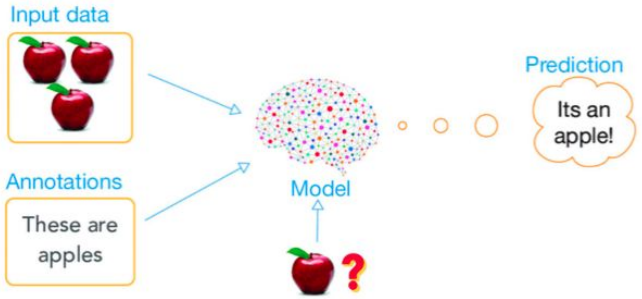
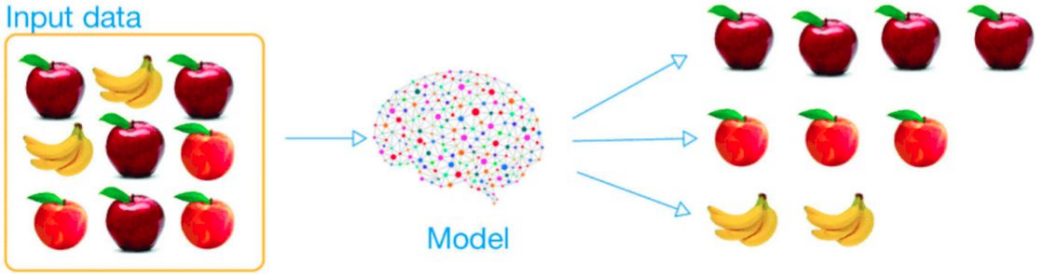
Supervised Learning



Unsupervised Learning



Applications of Data Science

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Source: Edureka's Data Science Certification Training

Careers of Data Science

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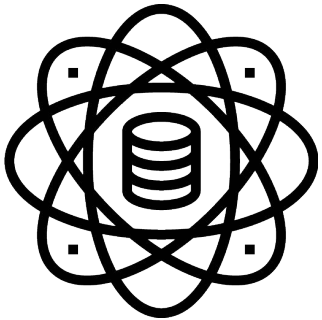
Data Engineer

performs tasks of data preparation like data cleaning and organizing. They build data pipeline & architecture, and perform data transformation including cleaning, structuring and formatting the data.

Business Analyst

formulates strategic plans for organizations, ensuring that the required information can be utilized and channelized properly. BA uses BI tools to drive innovation in business by keeping track of and analyzing the market trends.



Data Science

Data Analyst

Manages large sets of data and scrutinizing information by using data analysis tools, curate reports of the analysis and presenting them to the management.

Data Scientist

Performs more technical tasks including data modeling. A data scientist is also responsible for handling huge amounts of data to extricate useful patterns and trends from the data, and build the model to solve the problems.

Learning Path of Data Science

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Year 1

Basic Data Analytics Tools

- Microsoft Excel
- Power BI, Tableau.,etc.

Basic Mathematics

- Probability & Statistics
- Linear Algebra

Year 2

Programming skills for Exploratory Data Analysis

Data Processing

- Python (Pandas, Numpy)
- SQL, R

Data Visualization

- Matplotlib
- Seaborn

Year 3

Machine Learning

- Supervised Learning (Classification algorithms)

- Unsupervised Learning (Clustering algorithms)

Project Work

- Kaggle
- Internship Projects

Year 4

Final Thesis Internship

- Research Centers
- Industries

Master Degree Application

- School Admission
- Available scholarships

Training Objectives

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1. Demonstrate the knowledge regarding the basics of Python programming environment, including fundamental python programming techniques.

2. Apply data manipulation and cleaning techniques using the popular Python's Pandas library.

3. Apply statistical analysis in data processing and data analysis.

4. Visualize the data using Python libraries such as matplotlib, and seaborn.

5. Present the results to deliver interesting storyline and insights from the analysis.

What is Programming?

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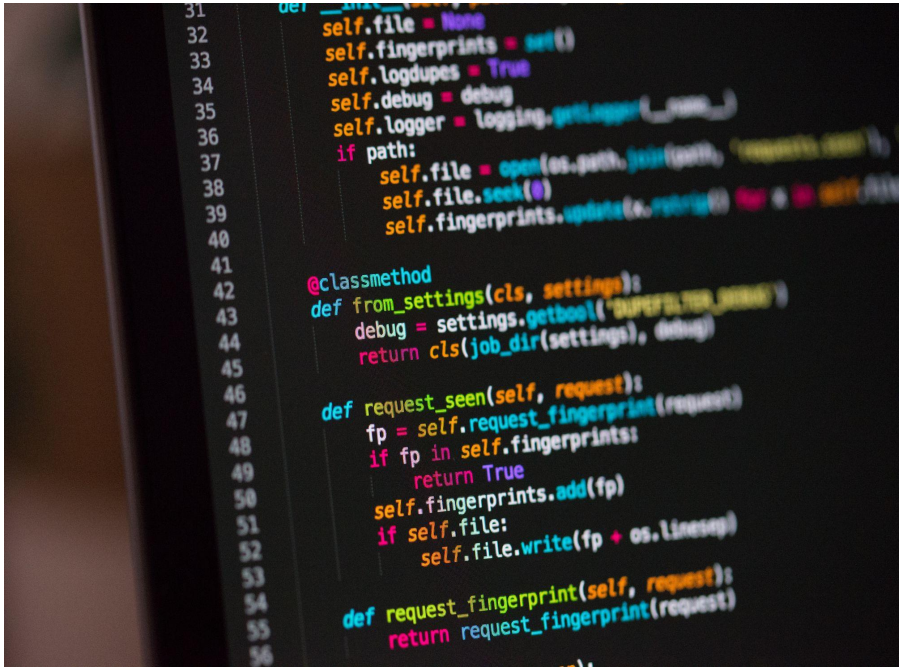
Programming is the process of creating a set of instructions that tell a computer how to perform a task.

It involves designing, writing, testing, and maintaining code using a programming language.



Purpose of Programming

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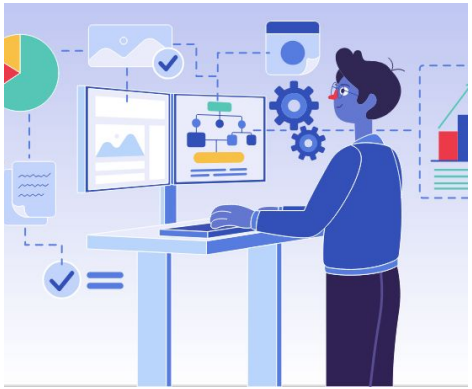

Automate Tasks

Solve Problems

Develop Applications

What is Python Programming?

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Python is a high-level, interpreted programming language known for its readability and simplicity.

Created by Guido van Rossum and first released in 1991.

Why Python?

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- **Easy to Learn:** Simple syntax. Great for beginners.
- **Multi-Purpose Language:** Used in web development, data analysis, data visualization, and more.
- **Large Community:** Extensive support and a wealth of libraries and frameworks.

Hello World

Java:

```
// Hello World in Java
class HelloWorld {
    static public void main(String args[]) {
        System.out.println("Hello World!");
}   }
```

C++:

```
// Hello World in C++
#include <iostream.h>
Main() {
    cout << "Hello World!" << endl;
    return 0;
}
```

Python:

```
# Hello World in Python
print("Hello World!")
```

Applications of Python

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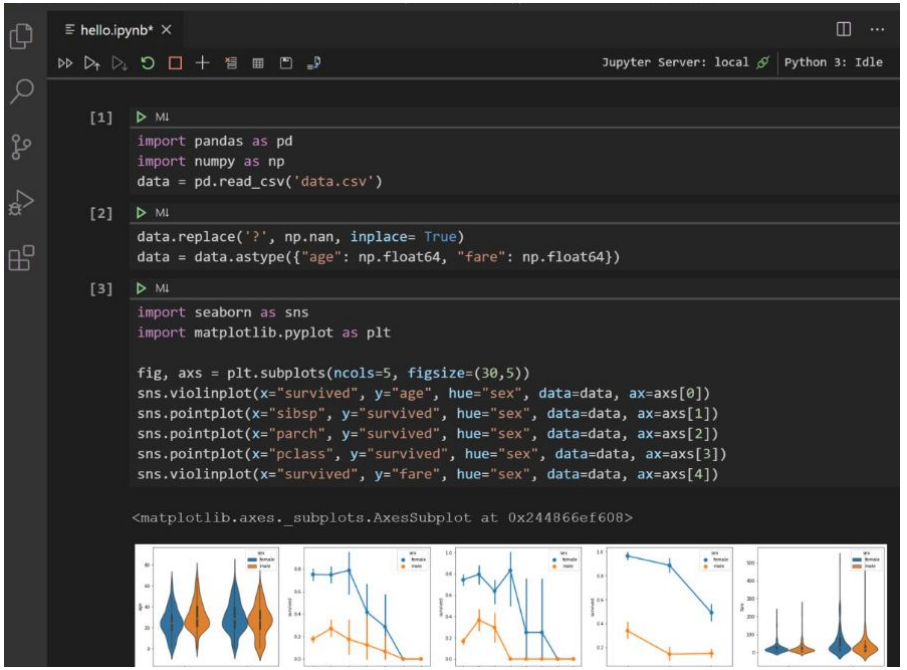
Data Science and Analysis:

Libraries such as:

- **Pandas** (Data manipulation and analysis)
- **NumPy** (Mathematical computation)
- **Matplotlib** (Interactive visualization)



Applications of Python

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Artificial Intelligence and Machine Learning

Tools such as:

- **TensorFlow**
- **PyTorch**

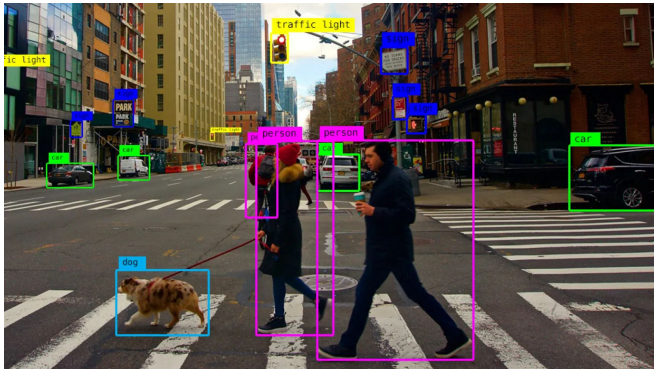
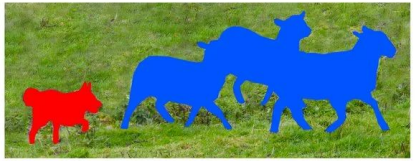
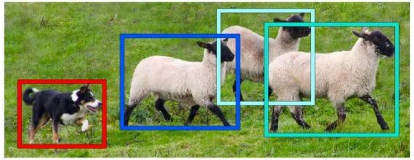


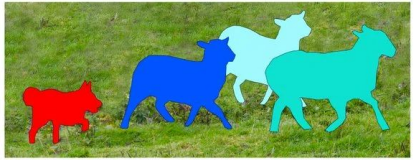
Image Recognition



Semantic Segmentation



Object Detection



Instance Segmentation

Applications of Python

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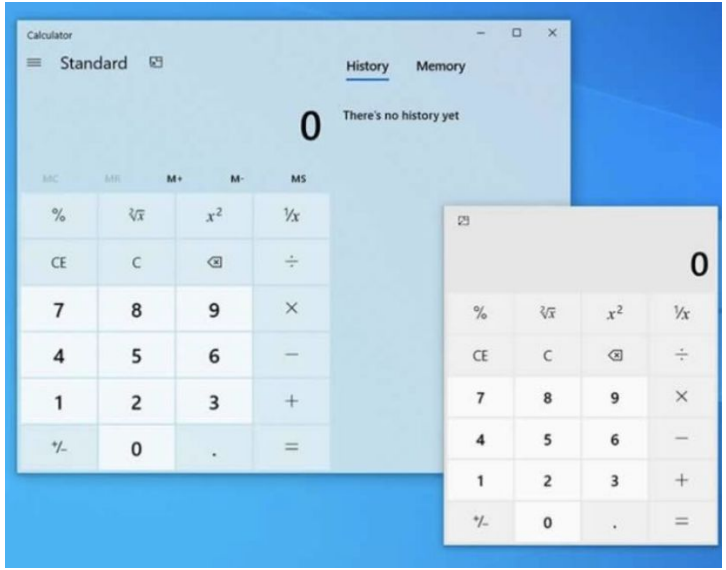
Web and Desktop GUI Development:

Libraries such as:

- **PyQt**
- **PyGtk**
- **Tkinter**
- **PyGUI**



Python Installation

Python Installation

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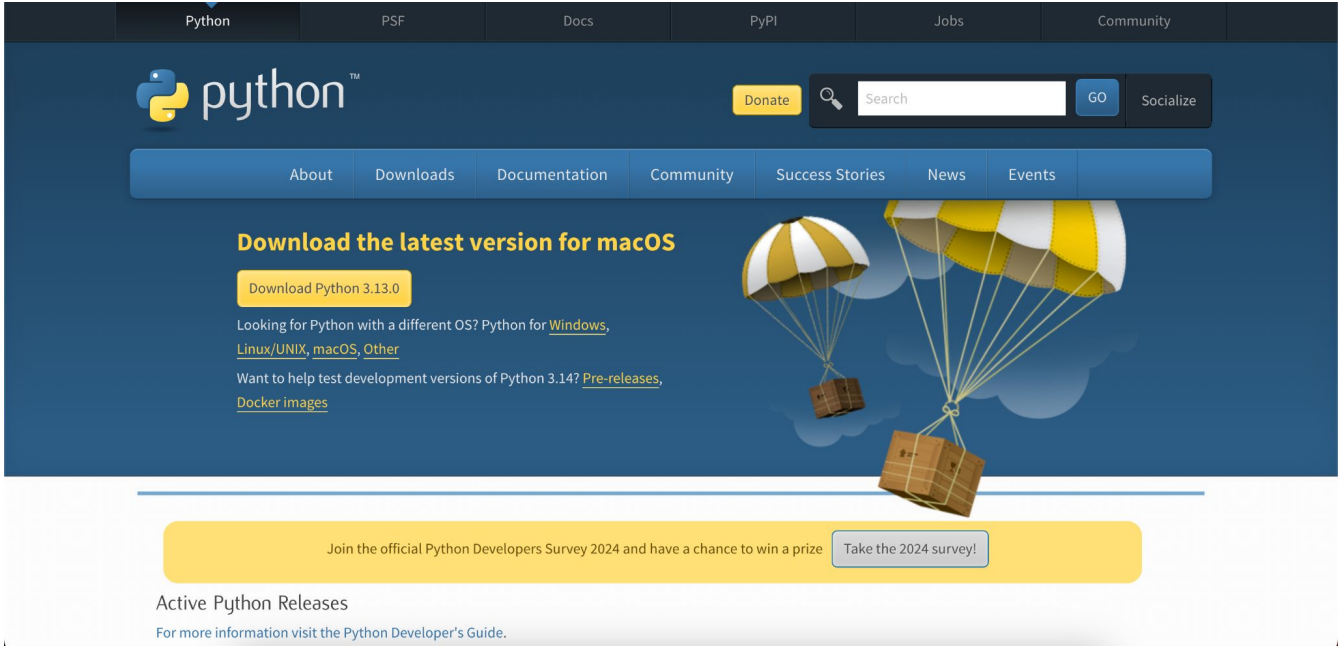
Step 1: Download Python Package from https://www.python.org/downloads/



Python Installation

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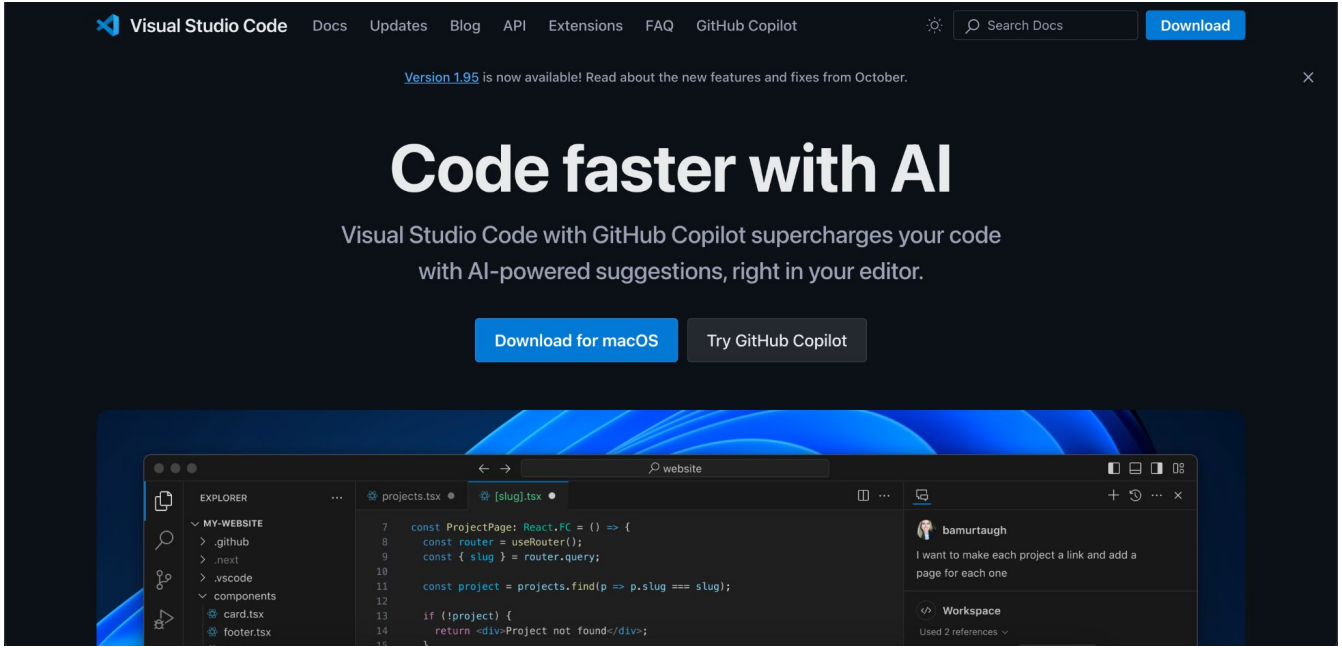
Step 2: Download VSCode from https://code.visualstudio.com/Download



Let’s write your first line of code!

Output in Python

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To display output a text or any value in Python we used the **print()**

Output in Python

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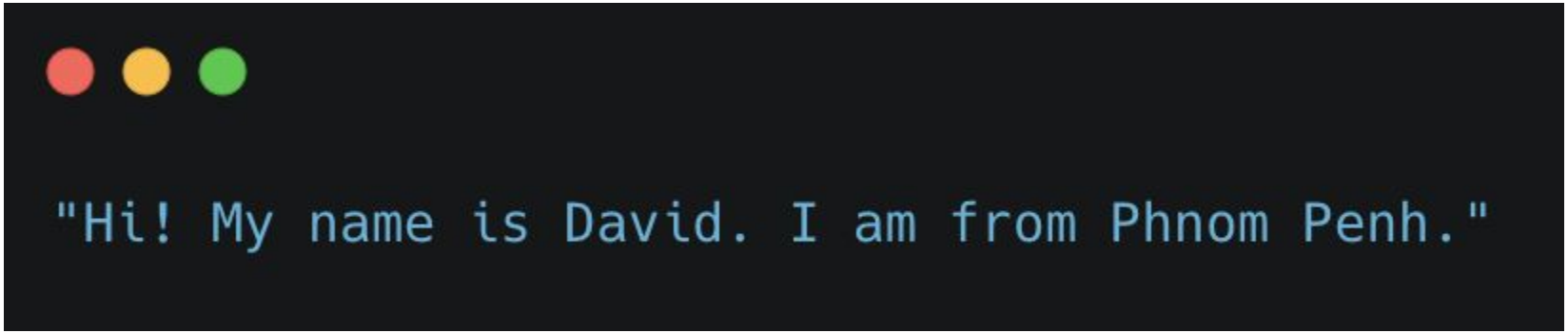
Output the following statement using the **print()**



Tabs & Newlines

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Tabs

We use “ \t ” for tabbing

```
print("Hello, Everyone!\n\tMy name is David.")

#Output
'''
Hello, Everyone!
    My name is David.
'''
```

Newlines

We use “ \n ”for creating new line

```
print("Hello, Everyone!\nMy name is David.")

#Output
'''
Hello, Everyone!
My name is David.
'''
```

Comments

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Comments are short descriptions in the code used to provide explanation to increase the readability of the code. Comments are ***not included*** in the execution of the program.

Two types of comments:

- “ # ” : a single line
- “ ''' ” : Multiple lines

Line Continuation

A backslash “\” is used for line continuation.

```
total = 5 + 3 + 2 + \
        7 + 4 + 6

print(total)
```

```
print("Hello \
World")
```

Note: You don’t need “\” inside:

- Parentheses (),
- Brackets []
- Braces {}

```
total = (
    1 + 2 +
    3 + 4
)
print(total)
```

Attention: Must be the last character on the line.

```
x = 1 + \  # To new line
    2
```

Let’s Practice!

Print this statement.

```
This is my first sentence.
    This is my second sentence with one tab.
        This is my third sentence with two tabs.
        This is my fourth sentence with two tabs.
This is my fifth sentence.
    This is my sixth sentence with one tab.
```

Thank You
for
Your Attention