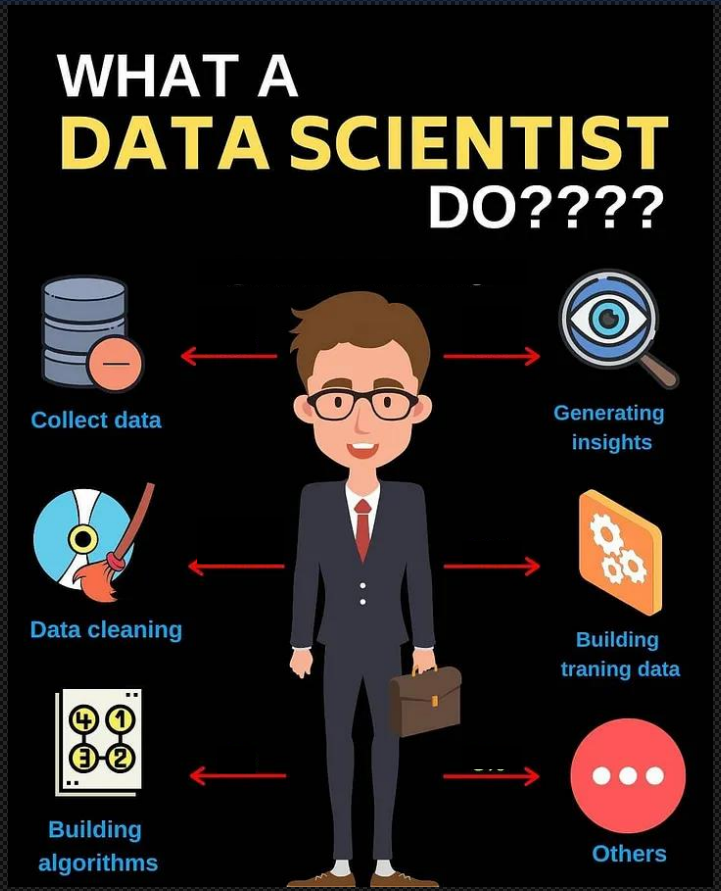
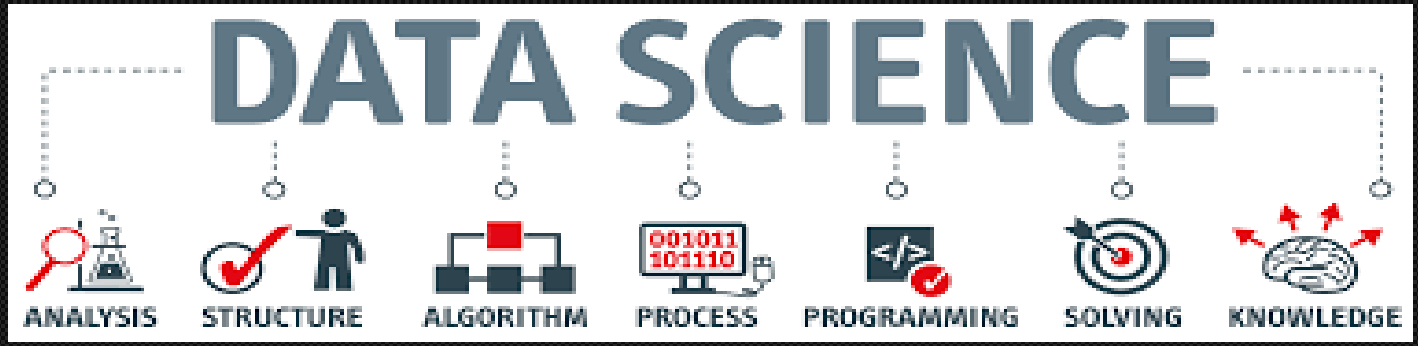
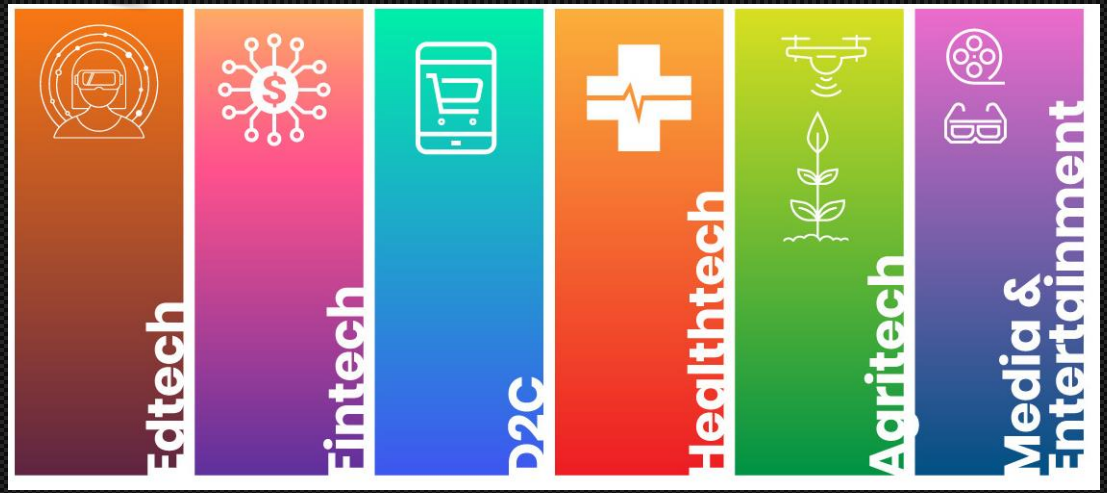
Lecture 1 – Fundamentals of Python

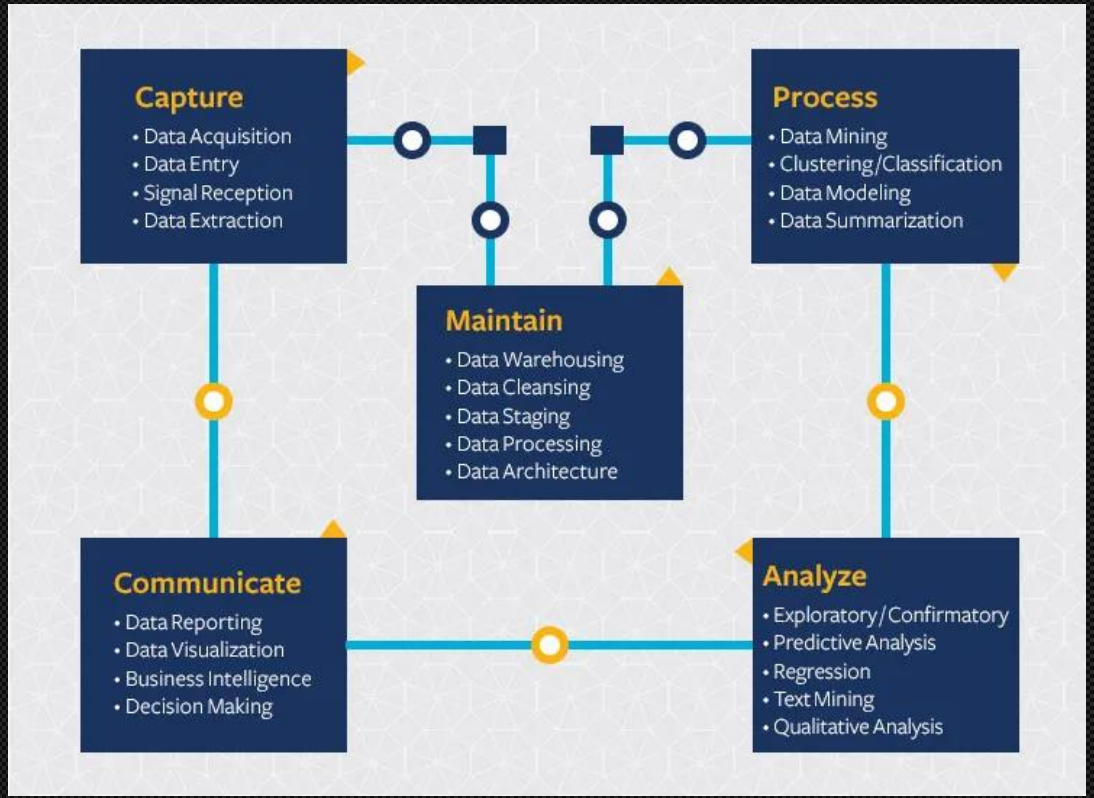


Lecture 1 – Fundamentals of Python



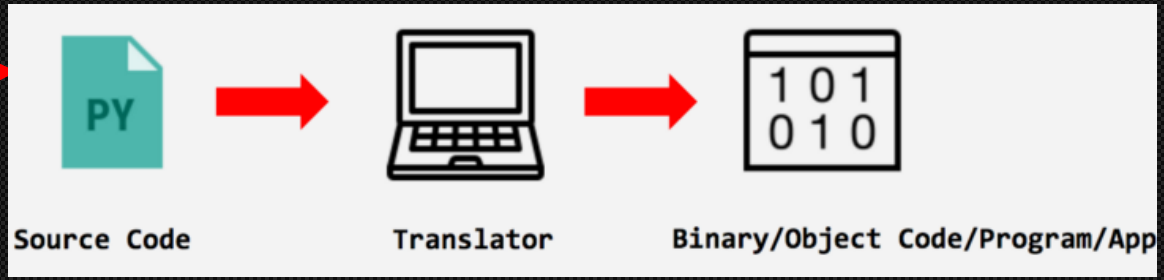


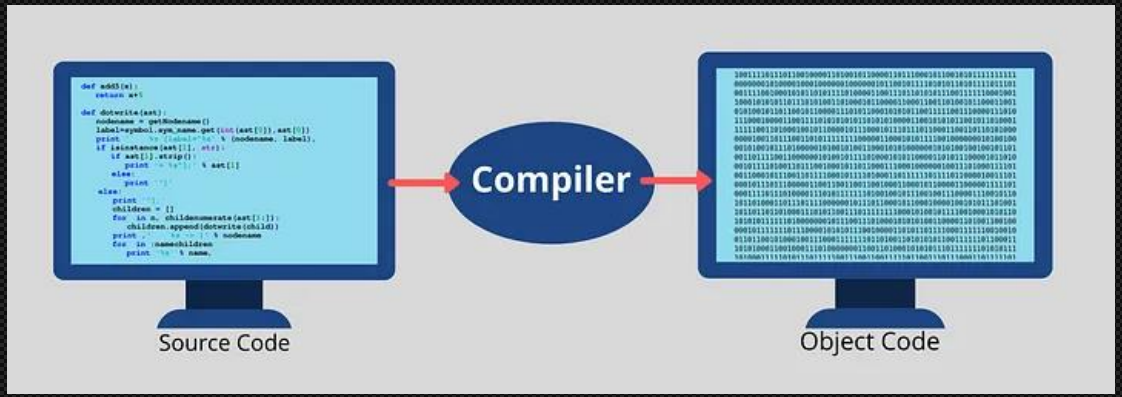
Lecture 1 – Fundamentals of Python



Lecture 1 – Fundamentals of Python

What is Programming ?





Lecture 1 – Fundamentals of Python

Why are we studying Python for data science?

Python is commonly used to develop chatbots - Chat GPT, Google Assistant, Siri, and chatbots used in customer service applications.

Python is used to build recommendation systems used by e-commerce platforms like Amazon and streaming services like Netflix.

Python is employed in image recognition , Examples include facial recognition systems.

TensorFlow is a free, open-source Python library developed by Google. Coca-Cola used TensorFlow to fuel its mobile proof of purchase model, which helped the company save millions of dollars by eliminating production line printers.

Lecture 1 – Fundamentals of Python

Why are we studying Python for data science?

Python is used in various AI-based healthcare applications, including medical image analysis, disease diagnosis, drug discovery, and personalized medicine.

Python is employed in AI-based financial applications for tasks such as algorithmic trading, fraud detection, risk assessment, and credit scoring.

Python is utilized in speech recognition system, Examples include voice assistants like Amazon Alexa.

PyTorch is an open-source library developed by Facebook's (Meta) AI Research lab. Twitter uses PyTorch for natural language processing tasks.Microsoft employs PyTorch for research and development in artificial intelligence.

Why Python is specifically used for data science?

Python offers a wide range of libraries and tools specifically designed for data manipulation, analysis, and visualization. Libraries like Pandas, NumPy, SciPy, and scikit-learn provide powerful functionalities for various data-related tasks.

Its simplicity enables faster development, prototyping, and iteration, which is crucial in the iterative nature of data science projects.

Python boasts a rich ecosystem of libraries and frameworks catering to different aspects of data science, including machine learning, deep learning, natural language processing, and more.

Python has a large and active community of developers, data scientists, and enthusiasts who contribute to its growth.

Python has gained widespread adoption in the data science industry, with many companies and organizations using it as their primary programming language for data analysis and modeling.

Lecture 1 – Fundamentals of Python

Brief History About Python

Python is a high-level, general-purpose programming language that was created by Guido van Rossum and first released in 1991.

On November 2020 Van Rossum holds the title Distinguished Engineer at Microsoft.

Van Rossum is now part of a team at Microsoft working to speed up the language's performance. And recently a Microsoft blog post reported that Python 3.11 had brought speedups of 10-60% to some parts of the language.

Lecture 1 – Fundamentals of Python

Anaconda Navigator

Anaconda Navigator is a graphical user interface (GUI), which is a popular Python distribution for data science and machine learning tasks.

It provides an easy-to-use interface for managing packages, environments, and applications related to Python programming, especially in the realm of data science and scientific computing.

Inside Anaconda Navigator, you have access to integrated development environments (IDEs) that are commonly used in Python development, particularly for data science and scientific computing tasks.

Lecture 1 – Fundamentals of Python

IDE – Integrated Development Environment

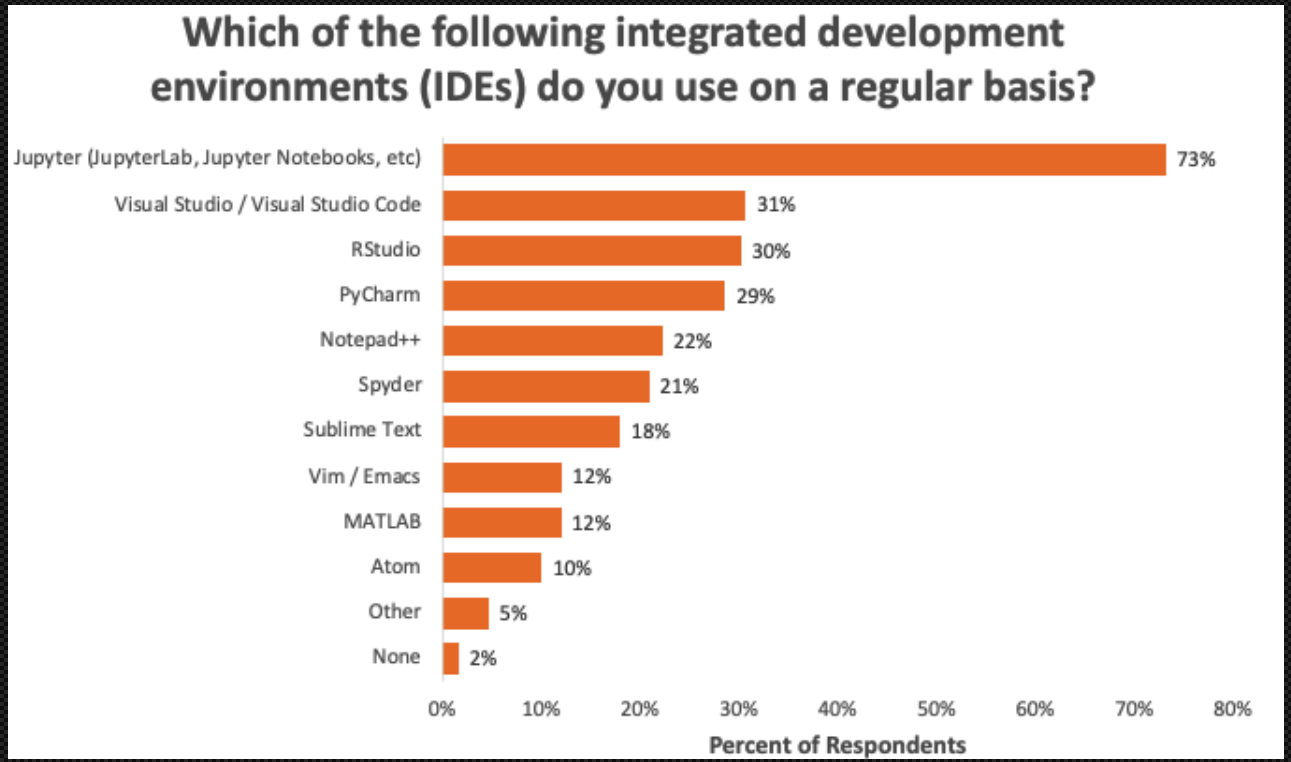
An Integrated Development Environment (IDE) is a software application that provides comprehensive facilities for software development.

It typically includes a code editor, a compiler or interpreter, build automation tools, debugging tools, and other features to streamline the process of writing, testing, and debugging code.

Data Visualization: Many IDEs include integrated data visualization tools that allow data scientists to explore and visualize datasets directly within the IDE. This enables them to quickly generate plots, charts, and graphs to better understand the data and identify patterns and trends.

IDE – Integrated Development Environment

Lecture 1 – Fundamentals of Python



Lecture 1 – Fundamentals of Python

Jupyter Notebook

Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations, and narrative text.

It's commonly used for data cleaning and transformation, numerical simulation, statistical modeling, data visualization, machine learning, and much more.

One of the key features of Jupyter Notebook is its interactivity, which allows you to run code in a step-by-step manner, making it excellent for exploratory data analysis and interactive computing.

Lecture 1 – Fundamentals of Python

Practice Question - 1

Which of the following is responsible for translating high-level programming code into machine code?

a) Compiler
b) Interpreter
c) Debugger
d) IDE

Ans – a) compiler is a translator program which translates a high level programming language into equivalent machine language programs.

Lecture 1 – Fundamentals of Python

Practice Question - 2

What is Anaconda Navigator primarily used for?

a) Version control of Python packages.
b) Managing and deploying machine learning models.
c) Creating and managing Python environments and packages.
d) Visualizing data using interactive dashboards.

Ans - c) Creating and managing Python environments and packages. Anaconda Navigator is primarily used for creating and managing Python environments and packages.

Lecture 1 – Fundamentals of Python

Practice Question - 3

What is the primary advantage of using Jupyter Notebook for data analysis?

a) Its ability to compile code into executable binaries.
b) Its support for real-time collaboration and interactive coding.
c) Its integration with version control systems like Git.
d) Its extensive collection of pre-built machine learning models. What is the correct answer of this question

Ans - b) Its support for real-time collaboration and interactive coding. Jupyter Notebook's primary advantage for data analysis is its support for real-time collaboration and interactive coding.