



Internship Report On **Python With Data Science Laptop Price Prediction**

Submitted by

Rohit Agarwal
22ETCCS140
Techno India NJR Institute
of Technology

Submitted to

Mallika Srivastava
Head, Training Delivery
EISystems Services

&

Mayur Dev Sewak
Head, Internships & Trainings
EISystems Services

Student's Declaration

I, Rohit Agarwal a student of B.Tech program, Roll No. 22ETCCS140 of the Department of CSE, Techno India NJR Institute of Technology College do hereby declare that I have completed the mandatory internship in Eisystems Technologies under the faculty guideship of Self, Department of CSE , Techno India NJR Institute of Technology.



03/05/2024

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Executive Summary

During the period of March 5th to April 31st, I undertook a comprehensive internship with EISystems Services, specializing in Python with a focus on data science. Throughout the two-month duration, I engaged in rigorous training, project development, and practical application of skills. The internship encompassed the creation of eight projects, with one centered on Python programming and the remaining seven dedicated to various aspects of data science.

The training phase of the internship was structured to provide a foundational understanding of Python programming language and its applications in the field of data science. Through hands-on exercises, tutorials, and mentorship, I gained proficiency in utilizing Python libraries such as Pandas, NumPy, Matplotlib, and Scikit-learn for data analysis, visualization, and machine learning tasks.

Each of the eight projects undertaken during the training phase served as a testament to the acquired skills and knowledge. From exploratory data analysis to predictive modeling, these projects demonstrated my ability to apply Python programming and data science techniques to solve real-world problems effectively. The projects covered diverse domains, showcasing versatility and adaptability in utilizing data-driven approaches.

Following the training phase, a larger project was undertaken to further consolidate the skills and concepts learned. This project involved the integration of advanced data science techniques to address a complex problem statement, showcasing proficiency in project management, problem-solving, and critical thinking.

Overall, the internship experience at EISystems Services has been enriching and rewarding. It provided an excellent platform to enhance my proficiency in Python programming and data science, equipping me with valuable skills essential for success in the field. The combination of theoretical learning, practical application, and project-based approach has significantly contributed to my professional development and preparedness for future endeavors in data science and related domains.

Overview of Organization

Introduction of the Organization:

EISystems Services is a leading technology firm dedicated to providing innovative solutions in the field of information technology. Established with a vision to revolutionize the digital landscape, EISystems Services has emerged as a trusted partner for businesses seeking cutting-edge technology solutions. With a focus on excellence and customer satisfaction, the organization strives to deliver superior services tailored to meet the diverse needs of its clientele.

Vision, Mission, and Values of the Organization:

- Vision: EISystems Services envisions becoming a global leader in technology innovation, driving digital transformation across industries.
- Mission: The mission of EISystems Services is to deliver exceptional technology solutions that empower businesses to thrive in the digital age, fostering growth, efficiency, and sustainability.
- Values: The core values of EISystems Services include integrity, innovation, collaboration, and customer-centricity. These values serve as guiding principles, shaping every aspect of the organization's operations and interactions.

Policy of the Organization, in relation with the intern role:

EISystems Services is committed to nurturing talent and fostering a culture of learning and growth. As part of its internship program, the organization provides interns with hands-on experience, mentorship, and opportunities for professional development. Interns are encouraged to actively engage in projects, contribute innovative ideas, and collaborate with team members to achieve organizational objectives. EISystems Services values the contributions of its interns and strives to create an inclusive and supportive environment where individuals can thrive and excel in their roles.

Project Summary

Idea behind making this project:

The idea behind developing the laptop price prediction project stemmed from the growing demand for accurate pricing models in the consumer electronics market. With the proliferation of laptop models offering diverse features and specifications, consumers often face challenges in determining fair prices for their desired configurations. This project aimed to leverage machine learning techniques to develop a predictive model capable of estimating laptop prices based on relevant attributes.

About the project:

The laptop price prediction project involved the collection and analysis of data pertaining to various laptop models, including specifications such as processor type, RAM capacity, storage capacity, display size, and brand. The dataset was meticulously curated to ensure accuracy and relevance, encompassing a wide range of laptops from different manufacturers and price points.

Software used in project:

The project utilized Python programming language along with popular libraries such as Pandas, NumPy, Scikit-learn, and Matplotlib for data preprocessing, feature selection, model training, and evaluation. Jupyter Notebook served as the primary development environment, offering an interactive platform for code execution and analysis.

Technical apparatus requirements before making this project:

Prior to initiating the project, the technical apparatus requirements included access to a suitable computing environment with sufficient processing power and memory to handle data preprocessing and model training tasks efficiently. Additionally, a reliable internet connection was necessary for data acquisition and research purposes.

Result or Working of project:

The laptop price prediction project resulted in the development of a robust machine learning model capable of accurately estimating laptop prices based on input features such as specifications and brand. The model demonstrated promising performance metrics, including high accuracy and low error rates, validating its effectiveness in predicting laptop prices with confidence.

Process Flow

1. Data Collection:

- Input: Data on laptop specifications and prices from various sources such as online retailers, manufacturers, and market research firms.
- Process: Gather data using web scraping techniques or obtain datasets from reliable sources.
- Output: Raw dataset containing attributes such as processor type, RAM capacity, storage capacity, display size, brand, and corresponding prices.

2. Data Preprocessing:

- Input: Raw dataset.
- Process:
 - Handle missing values: Impute missing values or remove incomplete records.
 - Feature engineering: Extract relevant features, encode categorical variables, and normalize numerical features.
- Output: Cleaned and processed dataset ready for model training.

3. Model Training:

- Input: Cleaned dataset.
- Process:
 - Split dataset: Divide data into training and testing sets for model evaluation.
 - Select model: Choose appropriate machine learning algorithm (e.g., linear regression, random forest) for price prediction.
 - Train model: Fit the selected model on the training data to learn the underlying patterns.
- Output: Trained machine learning model capable of predicting laptop prices based on input features.

4. Model Evaluation:

- Input: Trained model, testing dataset.
- Process:
 - Predict prices: Use the trained model to predict laptop prices on the testing data.
 - Evaluate performance: Calculate evaluation metrics such as mean squared error, mean absolute error, and R-squared to assess the model's accuracy and generalization ability.
- Output: Performance metrics indicating the effectiveness of the predictive

model.

5. Deployment:

- Input: Trained model, new laptop specifications.
- Process:
 - Input new data: Collect specifications of a new laptop for price estimation.
 - Preprocess data: Apply the same preprocessing steps as done during training.
 - Predict price: Utilize the trained model to predict the price of the new laptop.
- Output: Estimated price of the new laptop based on its specifications.

The code implementation would reflect the above process, incorporating functions and modules for data collection, preprocessing, model training, evaluation, and deployment. Each step would be clearly defined and executed sequentially to ensure a smooth flow from input to output, capturing all conditions and decisions involved in the process.

Program with Supported Screenshots

Screenshots:

1. Dataset:

	A	B	C	D	E	F	G	H	I	J	K	L
1		Company	TypeName	Inches	ScreenRes	Cpu	Ram	Memory	Gpu	OpSys	Weight	Price
2		0 Apple	Ultrabook	13.3	IPS Panel	Intel Core	8GB	128GB SSD	Intel Iris P	macOS	1.37kg	71378.68
3		1 Apple	Ultrabook	13.3	1440x900	Intel Core	8GB	128GB Fla	Intel HD G	macOS	1.34kg	47895.52
4		2 HP	Notebook	15.6	Full HD 19	Intel Core	8GB	256GB SSD	Intel HD G	No OS	1.86kg	30636
5		3 Apple	Ultrabook	15.4	IPS Panel	Intel Core	16GB	512GB SSD	AMD Rad	macOS	1.83kg	135195.3
6		4 Apple	Ultrabook	13.3	IPS Panel	Intel Core	8GB	256GB SSD	Intel Iris P	macOS	1.37kg	96095.81
7		5 Acer	Notebook	15.6	1366x768	AMD A9-S	4GB	500GB HD	AMD Rad	Windows	2.1kg	21312
8		6 Apple	Ultrabook	15.4	IPS Panel	Intel Core	16GB	256GB Fla	Intel Iris P	Mac OS X	2.04kg	114017.6
9		7 Apple	Ultrabook	13.3	1440x900	Intel Core	8GB	256GB Fla	Intel HD G	macOS	1.34kg	61735.54
10		8 Asus	Ultrabook	14	Full HD 19	Intel Core	16GB	512GB SSD	Nvidia Ge	Windows	1.3kg	79653.6
11		9 Acer	Ultrabook	14	IPS Panel	Intel Core	8GB	256GB SSD	Intel UHD	Windows	1.6kg	41025.6
12		10 HP	Notebook	15.6	1366x768	Intel Core	4GB	500GB HD	Intel HD G	No OS	1.86kg	20986.99
13		11 HP	Notebook	15.6	Full HD 19	Intel Core	4GB	500GB HD	Intel HD G	No OS	1.86kg	18381.07
14		12 Apple	Ultrabook	15.4	IPS Panel	Intel Core	16GB	256GB SSD	AMD Rad	macOS	1.83kg	130001.6
15		13 Dell	Notebook	15.6	Full HD 19	Intel Core	4GB	256GB SSD	AMD Rad	Windows	2.2kg	26581.39
16		14 Apple	Ultrabook	12	IPS Panel	Intel Core	8GB	256GB SSD	Intel HD G	macOS	0.92kg	67260.67
17		15 Apple	Ultrabook	13.3	IPS Panel	Intel Core	8GB	256GB SSD	Intel Iris P	macOS	1.37kg	80908.34
18		16 Dell	Notebook	15.6	Full HD 19	Intel Core	8GB	256GB SSD	AMD Rad	Windows	2.2kg	39693.6
19		17 Apple	Ultrabook	15.4	IPS Panel	Intel Core	16GB	512GB SSD	AMD Rad	macOS	1.83kg	152274.2
20		18 Lenovo	Notebook	15.6	Full HD 19	Intel Core	8GB	1TB HDD	Nvidia Ge	No OS	2.2kg	26586.72
21		19 Dell	Ultrabook	13.3	IPS Panel	Intel Core	8GB	128GB SSD	Intel UHD	Windows	1.22kg	52161.12
22		20 Asus	Netbook	11.6	1366x768	Intel Aton	2GB	32GB Flas	Intel HD G	Windows	0.98kg	10224.43
23		21 Lenovo	Gaming	15.6	IPS Panel	Intel Core	8GB	128GB SSD	Nvidia Ge	Windows	2.5kg	53226.72
24		22 HP	Notebook	15.6	1366x768	AMD E-Se	4GB	500GB HD	AMD Rad	No OS	1.86kg	13746.24
25		23 Dell	2 in 1 Com	13.3	Full HD / 1	Intel Core	8GB	256GB SSD	Intel UHD	Windows	1.62kg	43636.32
26		24 HP	Ultrabook	15.6	Full HD 19	Intel Core	8GB	256GB SSD	Intel HD G	Windows	1.91kg	35111.52
27		25 Dell	Notebook	15.6	1366x768	Intel Core	4GB	1TB HDD	Intel HD G	Windows	2.3kg	22305.14

2. Pre-processed Data:

```

Data Preprocessing

Removing 'unnamed' column name

df.drop(columns=['Unnamed: 0'], inplace=True)

df.head(1)

Company  TypeName  Inches  ScreenResolution  Cpu  Ram  Memory  Gpu  OpSys  Weight  Price
0  Apple  Ultrabook  13.3  IPS Panel Retina Display 2560x1600  Intel Core i5 2.3GHz  8GB  128GB SSD  Intel Iris Plus Graphics 640  macOS  1.37kg  71378.6832

Removing term 'kg' and 'GB' from Weight and RAM column items respectively

df['Ram'] = df['Ram'].str.replace('GB', '')
df['Weight'] = df['Weight'].str.replace('kg', '')

df.head(3)

Company  TypeName  Inches  ScreenResolution  Cpu  Ram  Memory  Gpu  OpSys  Weight  Price
0  Apple  Ultrabook  13.3  IPS Panel Retina Display 2560x1600  Intel Core i5 2.3GHz  8  128GB SSD  Intel Iris Plus Graphics 640  macOS  1.37  71378.6832
1  Apple  Ultrabook  13.3  1440x900  Intel Core i5 1.8GHz  8  128GB Flash Storage  Intel HD Graphics 6000  macOS  1.34  47895.5232
2  HP  Notebook  15.6  Full HD 1920x1080  Intel Core i5 7200U 2.5GHz  8  256GB SSD  Intel HD Graphics 620  No OS  1.86  30636.0000

df['Ram'] = df['Ram'].astype('int32')
df['Weight'] = df['Weight'].astype('float32')

```

3. Model Evaluation:

💡 Click here to ask Blackbox to help you code faster

Create the ColumnTransformer with 'passthrough' for other columns

```
step1 = ColumnTransformer(transformers=transformers, remainder='passthrough')
```

Create a LinearRegression model

```
step2 = LinearRegression()
```

Create a pipeline that applies the ColumnTransformer and then the LinearRegression model

```
pipe = Pipeline([
    ('step1', step1),
    ('step2', step2),
])
```

Fit the pipeline to the training data

```
pipe.fit(X_train, y_train)
```

Make predictions on the test data

```
y_pred = pipe.predict(X_test)
```

Evaluate the model performance

```
r2 = r2_score(y_test, y_pred)
```

```
mae = mean_absolute_error(y_test, y_pred)
```

```
print('R2 Score:', r2)
```

```
print('Mean Absolute Error:', mae)
```

R2 Score: 0.8073277448418663

Mean Absolute Error: 0.21017827976428632

Input / Output with Datasets & Supported Screenshots

Input:

- Dataset containing laptop specifications (laptop_data.csv)

Output:

- Predicted prices for a sample of laptops based on their specifications

Screenshot 1: Dataset (laptop_data.csv)

	A	B	C	D	E	F	G	H	I	J	K	L
1		Company	TypeName	Inches	ScreenRes	Cpu	Ram	Memory	Gpu	OpSys	Weight	Price
2	0	Apple	Ultrabook	13.3	IPS Panel	Intel Core	8GB	128GB SSD	Intel Iris P	macOS	1.37kg	71378.68
3	1	Apple	Ultrabook	13.3	1440x900	Intel Core	8GB	128GB Fla	Intel HD G	macOS	1.34kg	47895.52
4	2	HP	Notebook	15.6	Full HD 19	Intel Core	8GB	256GB SSD	Intel HD G	No OS	1.86kg	30636
5	3	Apple	Ultrabook	15.4	IPS Panel	Intel Core	16GB	512GB SSD	AMD Rade	macOS	1.83kg	135195.3
6	4	Apple	Ultrabook	13.3	IPS Panel	Intel Core	8GB	256GB SSD	Intel Iris P	macOS	1.37kg	96095.81
7	5	Acer	Notebook	15.6	1366x768	AMD A9-S	4GB	500GB HD	AMD Rade	Windows	2.1kg	21312
8	6	Apple	Ultrabook	15.4	IPS Panel	Intel Core	16GB	256GB Fla	Intel Iris P	Mac OS X	2.04kg	114017.6
9	7	Apple	Ultrabook	13.3	1440x900	Intel Core	8GB	256GB Fla	Intel HD G	macOS	1.34kg	61735.54
10	8	Asus	Ultrabook	14	Full HD 19	Intel Core	16GB	512GB SSD	Nvidia Ge	Windows	1.3kg	79653.6
11	9	Acer	Ultrabook	14	IPS Panel	Intel Core	8GB	256GB SSD	Intel UHD	Windows	1.6kg	41025.6
12	10	HP	Notebook	15.6	1366x768	Intel Core	4GB	500GB HD	Intel HD G	No OS	1.86kg	20986.99
13	11	HP	Notebook	15.6	Full HD 19	Intel Core	4GB	500GB HD	Intel HD G	No OS	1.86kg	18381.07
14	12	Apple	Ultrabook	15.4	IPS Panel	Intel Core	16GB	256GB SSD	AMD Rade	macOS	1.83kg	130001.6
15	13	Dell	Notebook	15.6	Full HD 19	Intel Core	4GB	256GB SSD	AMD Rade	Windows	2.2kg	26581.39
16	14	Apple	Ultrabook	12	IPS Panel	Intel Core	8GB	256GB SSD	Intel HD G	macOS	0.92kg	67260.67
17	15	Apple	Ultrabook	13.3	IPS Panel	Intel Core	8GB	256GB SSD	Intel Iris P	macOS	1.37kg	80908.34
18	16	Dell	Notebook	15.6	Full HD 19	Intel Core	8GB	256GB SSD	AMD Rade	Windows	2.2kg	39693.6
19	17	Apple	Ultrabook	15.4	IPS Panel	Intel Core	16GB	512GB SSD	AMD Rade	macOS	1.83kg	152274.2
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21	19	Dell	Ultrabook	13.3	IPS Panel	Intel Core	8GB	128GB SSD	Intel UHD	Windows	1.22kg	52161.12
22	20	Asus	Notebook	11.6	1366x768	Intel Aton	2GB	32GB Fla	Intel HD G	Windows	0.98kg	10224.43
23	21	Lenovo	Gaming	15.6	IPS Panel	Intel Core	8GB	128GB SSD	Nvidia Ge	Windows	2.5kg	53226.72
24	22	HP	Notebook	15.6	1366x768	AMD E-Se	4GB	500GB HD	AMD Rade	No OS	1.86kg	13746.24
25	23	Dell	2 in 1 Con	13.3	Full HD / T	Intel Core	8GB	256GB SSD	Intel UHD	Windows	1.62kg	43636.32
26	24	HP	Ultrabook	15.6	Full HD 19	Intel Core	8GB	256GB SSD	Intel HD G	Windows	1.91kg	35111.52
27	25	Dell	Notebook	15.6	1366x768	Intel Core	4GB	1TB HDD	Intel HD G	Windows	2.2kg	22205.14

Images

	A	B	C	D	E	F	G	H	I	J	K	L
1		Company	TypeName	Inches	ScreenRes	Cpu	Ram	Memory	Gpu	OpSys	Weight	Price
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9	7	Apple	Ultrabook	13.3	1440x900	Intel Core	8GB	256GB Fla	Intel HD G	macOS	1.34kg	61735.54
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21	19	Dell	Ultrabook	13.3	IPS Panel	Intel Core	8GB	128GB SSD	Intel UHD	Windows	1.22kg	52161.12
22	20	Asus	Netbook	11.6	1366x768	Intel Aton	2GB	32GB Flasi	Intel HD G	Windows	0.98kg	10224.43
23	21	Lenovo	Gaming	15.6	IPS Panel	Intel Core	8GB	128GB SSD	Nvidia Ge	Windows	2.5kg	53226.72
24	22	HP	Notebook	15.6	1366x768	AMD E-Se	4GB	500GB HDI	AMD Radé	No OS	1.86kg	13746.24
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26	24	HP	Ultrabook	15.6	Full HD 19	Intel Core	8GB	256GB SSD	Intel HD G	Windows	1.91kg	35111.52
27	25	Dell	Notebook	15.6	1366x768	Intel Core	4GB	1TB HDD	Intel HD G	Windows	2.3kg	22205.14

Data Preprocessing

Removing 'unnamed' column name

```
df.drop(columns=['Unnamed: 0'], inplace=True)
```

```
df.head(1)
```

Removing term 'kg' and 'GB' from Weight and RAM column items respectively

```
df['Ram'] = df['Ram'].str.replace('GB', '')
df['Weight'] = df['Weight'].str.replace('kg', '')
```

```
df.head(3)
```

	Company	TypeName	Inches	ScreenResolution	Cpu	Ram	Memory	Gpu	OpSys	Weight	Price
0	Apple	Ultrabook	13.3	IPS Panel Retina Display 2560x1600	Intel Core i5 2.3GHz	8GB	128GB SSD	Intel Iris Plus Graphics 640	macOS	1.37kg	71378.6832
1	Apple	Ultrabook	13.3	1440x900	Intel Core i5 1.8GHz	8	128GB Flash Storage	Intel HD Graphics 6000	macOS	1.34	47895.5232

```
df['Ram'] = df['Ram'].astype('int32')
df['Weight'] = df['Weight'].astype('float32')
```

Click here to ask Blackbox to help you code faster

```
# Create the ColumnTransformer with 'passthrough' for other columns
step1 = ColumnTransformer(transformers=transformers, remainder='passthrough')
```

```
# Create a LinearRegression model
step2 = LinearRegression()
```

```
# Create a pipeline that applies the ColumnTransformer and then the LinearRegression model
pipe = Pipeline([
    ('step1', step1),
    ('step2', step2),
])
```

```
# Fit the pipeline to the training data
pipe.fit(X_train, y_train)
```

```
# Make predictions on the test data
y_pred = pipe.predict(X_test)
```

```
# Evaluate the model performance
r2 = r2_score(y_test, y_pred)
mae = mean_absolute_error(y_test, y_pred)
```

```
print('R2 Score:', r2)
print('Mean Absolute Error:', mae)
```

R2 Score: 0.8073277448418663

Mean Absolute Error: 0.21017827976428632

References

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6. "Machine Learning Algorithms - A Review," B. G. Glorot et al., CoRR, abs/1408.4410, 2014.
7. "The Elements of Statistical Learning: Data Mining, Inference, and Prediction," T. Hastie, R. Tibshirani, and J. Friedman, Springer, 2009.

Student *Self Evaluation of the Short-Term Internship*

Please rate your performance in the following areas:

1) Oral communication	1	2	3	4	5
2) Written communication	1	2	3	4	5
3) Initiative	1	2	3	4	5
4) Interaction with staff	1	2	3	4	5
5) Attitude	1	2	3	4	5
6) Dependability	1	2	3	4	5
7) Ability to learn	1	2	3	4	5
8) Planning and organization	1	2	3	4	5
9) Professionalism	1	2	3	4	5
10) Creativity	1	2	3	4	5
11) Quality of work	1	2	3	4	5
12) Productivity	1	2	3	4	5
13) Progress of learning	1	2	3	4	5
14) Adaptability to organization's culture/policies	1	2	3	4	5
15) OVERALL PERFORMANCE	1	2	3	4	5

Rating Scale: 5 will be Best while 1 will be Worst



Signature of the Student

Annexure 1

Daily Activity Report

Week No: 1

Day & Date	Brief Description of Daily Activity	Learning Outcome	Person In-Charge
Day 1	Introduction to Python Programming	Understanding the importance and applications of Python programming language.	
Day 2	Installation of Python	Learning how to install Python on different operating systems.	
Day 3	Execution Steps, Interactive Shell	Exploring the different ways to execute Python code, including interactive shell and command-line execution.	
Day 4	User Interface or IDE	Introduction to Python Integrated Development Environments (IDEs) and selecting suitable IDEs for development.	
Day 5	Creating Your First Python Program	Writing and executing a simple Python program to understand the basic syntax and structure of Python code.	

Annexure 1

Daily Activity Report

Week No: 2

Day & Date	Brief Description of Daily Activity	Learning Outcome	Person In-Charge
Day 1	Memory Management and Garbage Collection	Understanding how Python manages memory and handles garbage collection to optimize memory usage.	
Day 2	Object Creation and Deletion	Learning about object creation and deletion in Python, including dynamic memory allocation and deallocation.	
Day 3	Object Properties, Data Types and Operations	Exploring different data types in Python and performing operations such as arithmetic, comparison, and logical.	
Day 4	Numbers, String Operations	Working with numeric data types and string manipulation operations in Python.	
Day 5	List, Tuple	Understanding list and tuple data structures in Python, including creation, indexing, slicing, and methods.	

Annexure 1

Daily Activity Report

Week No: 3

Day & Date	Brief Description of Daily Activity	Learning Outcome	Person In-Charge
Day 1	Functions	Introduction to functions in Python, defining functions, and understanding their importance in code organization.	
Day 2	Function Definition and Call, Function Scope	Exploring function definitions, calling functions, and understanding variable scope within functions.	
Day 3	Function Arguments	Learning about function arguments, including positional arguments, keyword arguments, and default values.	
Day 4	Modules and Packages	Understanding modules and packages in Python, organizing code into reusable modules and structuring packages.	
Day 5	Module Creations and Usage, Types of Package in Python	Creating and using modules, exploring different types of packages in Python, and understanding their usage.	

Annexure 1

Daily Activity Report

Week No: 4

Day & Date	Brief Description of Daily Activity	Learning Outcome	Person In-Charge
Day 1	Classes	Introduction to classes in Python, defining classes, and understanding the concept of objects and instances.	
Day 2	Classes and Instances	Working with class instances, accessing attributes and methods, and understanding instance variables.	
Day 3	Classes Method Calls	Invoking methods on class instances and understanding the concept of method calls in Python.	
Day 4	Class Methods, Instance Methods	Differentiating between class methods and instance methods, and understanding their respective use cases.	
Day 5	Static Methods	Exploring static methods in Python, understanding their role and usage in class definitions.	

Annexure 1

Daily Activity Report

Week No: 5

Day & Date	Brief Description of Daily Activity	Learning Outcome	Person In-Charge
Day 1	Statements and Syntax	Understanding Python statements, syntax rules, and the importance of proper indentation.	
Day 2	Assignments, Expressions and Prints	Learning about assignments, expressions, and print statements in Python, and their usage in code.	
Day 3	If tests and Syntax Rules	Exploring if statements, conditional tests, and syntax rules for writing conditional expressions in Python.	
Day 4	While and For Loops	Working with while and for loops in Python, understanding looping constructs and their applications.	
Day 5	File Operations	Introduction to file handling in Python, including opening, reading, writing, and closing files.	

Annexure 1

Daily Activity Report

Week No: 6

Day & Date	Brief Description of Daily Activity	Learning Outcome	Person In-Charge
Day 1	OOPs concept	Understanding Object-Oriented Programming (OOP) concepts such as abstraction, encapsulation, and polymorphism.	
Day 2	Abstraction, Encapsulation	Exploring abstraction and encapsulation principles in OOP, and understanding their significance in code design.	
Day 3	Polymorphism	Learning about polymorphism and its types in Python, including method overriding and method overloading.	
Day 4	Inheritance	Introduction to inheritance in OOP, understanding inheritance hierarchy, and implementing inheritance in Python.	
Day 5	Types of Inheritance	Exploring different types of inheritance such as single, multiple, multilevel, and hierarchical inheritance.	

Annexure 1

Daily Activity Report

Week No: 7

Day & Date	Brief Description of Daily Activity	Learning Outcome	Person In-Charge
Day 1	Exception Handling	Introduction to exception handling in Python, handling errors and exceptions gracefully in code.	
Day 2	Default Exception Handler	Understanding the default exception handler in Python and its role in error handling.	
Day 3	Except Exceptions	Using the 'except' statement to catch specific exceptions and handle them appropriately.	
Day 4	Raise an Exception	Learning how to raise custom exceptions in Python, creating and raising exceptions based on specific conditions.	
Day 5	User Defined Exception	Creating custom exception classes in Python to handle application-specific errors.	

Annexure 1

Daily Activity Report

Week No: 8

Day & Date	Brief Description of Daily Activity	Learning Outcome	Person In-Charge
Day 1	Accessing Internet Data with Python	Exploring various methods to access internet data using Python, including web scraping and APIs.	
Day 2	Manipulating XML with Python	Introduction to XML parsing in Python, reading, writing, and manipulating XML data using Python libraries.	
Day 3	Activities & Project Discussion	Discussion on various activities and projects related to Python programming and Data Science.	
Day 4	Installing Different Libraries of Python	Practical session on installing and managing different Python libraries using package managers.	
Day 5	Project Discussion	Brainstorming and planning for project work, selecting project topics, and dividing tasks among team members.	

Annexure 2

Weekly Progress Report

Week(s)	Summary of Weekly Activity
Week 1	Introduction to Python programming language, installation, execution steps, and creating first program.
Week 2	Memory management, data types, object properties, and introduction to lists and tuples.
Week 3	Functions, modules, classes, and instance methods.
Week 4	Statements, syntax, file operations, and loops.
Week 5	OOPs concepts, exception handling, accessing internet data, and manipulating XML with Python.
Week 6	Revision of Python programming, introduction to machine learning, and overview of Data Science.
Week 7	Working with Python libraries for Data Science, data analysis, and applying algorithms on datasets.
Week 8	Understanding machine learning algorithms, working with datasets, and discussing projects for implementation.