Department of Artificial Intelligence and Multimedia Gaming

Artificial Intelligence (Fall-2025)

LAB # 01

Lab 01: Introduction to Python Programming

Duration: 2 Hours

1. Objectives

- Understand Python basics and its role in Artificial Intelligence.
- Learn about Anaconda Prompt, Navigator, and Jupyter Notebook.
- Use print() function, variables, and data types.
- Apply type() function to check data types.
- Perform arithmetic and relational operations.
- Use **, // operators.
- Write conditional statements (if, else, elif).
- Solve simple problems using Python.

2. Background / Theory

Python is a high-level, versatile programming language widely used in Artificial Intelligence because of:

- Simplicity: Easy-to-read syntax.
- Libraries: Rich ecosystem (NumPy, Pandas, TensorFlow).
- Community: Strong support for AI/ML projects.

Anaconda provides a package manager, environment manager, and IDEs like Jupyter Notebook, making it convenient for AI development.

3. Software Required

- Anaconda (Python Distribution): https://www.anaconda.com/download
- Use Jupyter Notebook from Anaconda or via https://colab.research.google.com/

4. Lab Practice (Step by Step)

1. Step 1: Setup - Install Anaconda. Open Anaconda Prompt and run commands:

   conda info
   python –version
   jupyter notebook.

2. Step 2: Writing First Python Code - Open Jupyter Notebook and write basic print statements.

1. Printing Text (Strings)

```
print("Hello, World!")
print("Python is powerful!")
```

➞ Output: Just displays the message inside quotes.

2. Printing Numbers

```
print(10)
print(3.14)
```

➞ No quotes needed for numbers.

3. Printing Multiple Items

```
name = "Ali"
age = 21
print("Name:", name, "Age:", age)
```

➞ By default, Python separates items with a space.

🔷 4. Printing with sep (Custom Separator)

```
print("A", "B", "C", sep="-")
print("2025", "08", "20", sep="/")
```

➞ Output:

A-B-C
2025/08/20

5. Printing with end (Change Line Ending)

```
print("Hello", end=" ")
print("World!")
```

➞ Normally print() ends with a new line, but here it ends with a space.
Output: Hello World!

6. Printing with Escape Sequences

```
print("Hello\nWorld")   # New line
print("Hello\tWorld")   # Tab space
print("This is a backslash: \\")
```

7. Printing Formatted Strings (f-strings)

```
name = "Sara"
marks = 95
print(f"Student {name} scored {marks}%")
```

➞ Cleaner way to print variables inside text.

8. Printing with .format()

```
fruit = "apple"
price = 120
print("The {0} costs {1} rupees.".format(fruit, price))
```

9. Printing Expressions Directly

```
print("2 + 3 =", 2 + 3)
print("Square of 7 is", 7 ** 2)
```

10. Printing Raw Strings (Ignore Escape Sequences)

```
print(r"C:\Users\Ali\Desktop\file.txt")
```

3. Step 3: Variables and Data Types - Assign values and check their types using type().

```
age = 30
pi = 3.14
name = "Ali"
passed = True
print(type(age), type(pi), type(name), type(passed))
```

4. Step 4: Operators - Use arithmetic (+ - * / // % **) and relational operators (<, >, ==, !=).

```
num1 = 10
num2 = 3
print("Floor Division:", num1 // num2)
print("Power:", num1 ** num2)

a = 10
b = 20

print("a == b:", a == b)   # False
print("a != b:", a != b)   # True
print("a > b:", a > b)     # False
print("a < b:", a < b)     # True
print("a >= b:", a >= b)   # False
```

```
print("a <= b:", a <= b)   # True
```

5. Step 5: Conditional Statements - Write programs using if, elif, else.

```
temperature = int(input("Enter temperature in Fahrenheit: "))
if temperature > 90:
    print("It is hot outside")
elif temperature < 30:
    print("It is cold outside")
else:
    print("It is not hot outside")
```

5. Lab Submission Tasks

1. Write a program that converts **age into hours**.
2. Write a program to **calculate the area of a circle**.
3. Write a program that converts **temperature from Celsius to Fahrenheit**.
4. Write a program that takes a **number as input and prints its square and cube**.
5. Write a program that checks whether a **number is even or odd**.
6. Write a program to **find the largest of three numbers**.
7. Write a program that takes **marks of 5 subjects**, finds the total, and prints the **average percentage**.
8. Write a program that prints your **name, age, and city** in a single line.
9. Write a program that converts **kilometers into miles** (1 km = 0.621 miles).
10. Write a program that asks the user for two numbers and prints their **sum, difference, product, and quotient**.

Guidelines:

1. Submit your notebook file in classroom with neat and clean code with proper comments.
2. Do not cheat. Submitting another student's work will result in deduction of marks.