

AI Lab - Week 1 : Python Fundamentals & Logic

Date: Jan 12, 2026

Subject: AI Lab (CS-205)

Submission: Create a single Jupyter Notebook (RollNo_Lab01.ipynb) containing solutions for all parts.

Part 1: Calendar & Datetime

Tests the use of Python's built-in modules.

1. **Display a Specific Month:** Write a Python program that asks the user for a specific year and month, then displays the calendar for that month using the calendar module.
2. **Display All Months:** Write a program to print the calendar for every month of a given year.
3. **Current Date & Time:** Write a script to display the today's date and the current date and time using the datetime module.
4. **Date Arithmetic:** Write a program to take the present date, add a specific number of days to it (e.g., 5 days), and print the resulting future date.
5. **Leap Year Check:** Write a program that inputs a year and determines if it is a leap year (Try doing this both with the calendar module and with simple if-else logic).

Part 2: Conditional Logic

Tests decision-making flows.

1. **Positive, Negative, or Zero:** Write a program to read a number from the user and determine if it is positive, negative, or zero.
2. **Largest of Three:** Write a program that takes three numbers as input and prints the largest one.
3. **Day of the Week:** Write a program that takes a number (1-7) and displays the corresponding day of the week (e.g., 1 = Monday). Handle invalid inputs gracefully.
4. **Simple Calculator:** Create a program that takes two numbers and an operator (+, -, *, /) and performs the corresponding calculation.

Part 3: Strings & Loops

Tests iteration and text manipulation.

1. **Palindrome Check:** Write a program to check if a given string is a palindrome (reads the same forwards and backwards).
2. **Fibonacci Series:** Write a program to print the first n terms of the Fibonacci

- sequence using a loop.
3. **Multiplication Table:** Write a program to print the multiplication table of a given number (e.g., if input is 5, print $5 \times 1 = 5$, $5 \times 2 = 10$... up to 10).

Part 4: Functions & Lists

Tests modular code and data structures.

1. **Factorial Function:** Write a function that calculates the factorial of a given number. Handle the case for negative numbers (where factorial is undefined).
2. **Compare Lists:** Write a function that accepts two lists and returns True if they are equal (contain the same elements in the same order), and False otherwise.
3. **List Statistics:** Write a program that accepts a list of numbers from the user and calculates the **sum**, **average**, and **maximum** value in that list without using built-in `max()` or `sum()` functions.