AYTS 5001 - Programming for Analytics

Lab 2: Control Structures and Functions

Duration: 2 hours

Learning Objectives

- Use if/elif/else statements to implement decision-making in Python
- Write for and while loops to repeat tasks
- Define and call functions with parameters and return values
- Apply control structures in solving small programming challenges

Instructions

Work through each of the following tasks in a Jupyter Notebook or Python script. Save your work and push it to your GitHub repository if applicable. Ask your lab instructor for assistance if needed.

Task 1: Even or Odd Number Checker (15 mins)

Write a program that asks the user to enter a number. The program should print whether the number is even or odd.

Task 2: Multiples of 3 (15 mins)

Write a program that prints all numbers from 1 to 50 that are divisible by 3. Use a for loop with range().

Task 3: Password Strength Checker (25 mins)

Ask the user to enter a password. Check if it meets the following rules:
- At least 8 characters long
- Contains at least one digit
- Contains at least one special character (e.g. !, @, #, $, %, &, *)
Use if/else statements and string methods. Print appropriate messages indicating which rules were not met.

Task 4: FizzBuzz Challenge (20 mins)

Write a program that prints the numbers from 1 to 50.
- For multiples of 3, print 'Fizz' instead of the number.
- For multiples of 5, print 'Buzz'.
- For numbers that are multiples of both 3 and 5, print 'FizzBuzz'.

Task 5: Temperature Conversion Table (20 mins)

Write a function that takes a start and end temperature in Celsius and prints a conversion table from Celsius to Fahrenheit.

Use a loop to print the Celsius value and its corresponding Fahrenheit value.
Fahrenheit = (Celsius × 9/5) + 32

Task 6: Factorial Function with Input Check (20 mins)

Write a function that calculates the factorial of a number using a loop.
First, check if the user input is a non-negative integer. If not, print an error message.
If valid, calculate and return the factorial.

Task 7: Prime Number Checker (Mandatory Challenge)

Write a function that checks whether a given number is prime.
Ask the user to enter a number and print whether it is prime or not.
Use a for loop and proper logic to test for divisibility.

Submission

Push your completed notebook to GitHub.