

Worksheet 2

University of Edenberg
CSE114 - Programming with Python
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Task 1 - Loop Structures and Booleans

Question 1

The Fibonacci sequence starts 1, 1, 2, 3, 5, 8, Each number in the sequence (after the first two) is the sum of the previous two. Write a program that computes and outputs the n th Fibonacci number, where n is a value entered by the user.

Question 2

Write a program that uses a while loop to determine how long it takes for an investment to double at a given interest rate. The input will be an annualised interest rate; the output is the number of years it takes an investment to double. Note: The initial investment amount does not matter; you can use \$1.

Task 2 - Persistent Data

Question 3

Create a Python program that simulates a simple employee management system. The program should allow users to:

1. Add a new employee record:
 - Prompt the user to enter an employee's name, ID, and department.
 - Save the record to a text file named *employees.txt* in the format:

ID , Name , Department
2. View all employee records:
 - Read the *employees.txt* file and display all employee records in a tabular format.

3. Search for an employee by ID:

- Allow the user to enter an employee ID.
- Search the *employees.txt* file for a matching record and display it. If no match is found, display an appropriate message.

4. Delete an employee record by ID:

- Allow the user to enter an employee ID to delete.
- Remove the corresponding record from the file and save the updated data back to *employees.txt*.

Example interaction

==== Employee Management System ====

1. Add a new employee
2. View all employees
3. Search for an employee by ID
4. Delete an employee by ID
5. Exit

Enter your choice: 1

Enter Employee Name: John Doe

Enter Employee ID: 101

Enter Department: HR

Employee added successfully!

==== Employee Management System ====

1. Add a new employee
2. View all employees
3. Search for an employee by ID
4. Delete an employee by ID
5. Exit

Enter your choice: 2

ID	Name	Department
101	John Doe	HR

==== Employee Management System ====

1. Add a new employee
2. View all employees
3. Search for an employee by ID
4. Delete an employee by ID
5. Exit

Enter your choice: 3

Enter Employee ID to search: 101
Record Found:
ID: 101, Name: John Doe, Department: HR

== Employee Management System ==

1. Add a new employee
2. View all employees
3. Search for an employee by ID
4. Delete an employee by ID
5. Exit

Enter your choice: 4

Enter Employee ID to delete: 101
Record deleted successfully!

== Employee Management System ==

1. Add a new employee
2. View all employees
3. Search for an employee by ID
4. Delete an employee by ID
5. Exit

Enter your choice: 2

No employee records found.

Task 3 - Computing With Numbers

Question 4

Write a program to calculate the volume and surface area of a sphere from its radius, given as input. Here are some formulas that might be useful:

$$V = \frac{4}{3}\pi r^3$$
$$A = 4\pi r^2$$

Question 5

Write a program to find the sum of the cubes of the first n natural numbers where the value of n is provided by the user.

Submission Requirements:

1. This worksheet will not contribute to your continuous assessment.
2. Submit all your programs in separate .py files, clearly labelling each file (e.g., question1.py).
3. Ensure your code is free of errors and runs without issues.
4. Submit your code in a zipped file to alinani10@gmail.com