Programming and Problem Solving through Python Language
O Level / A Level

Chapter -2 : Algorithms for Problem Solving

FLOWCHART

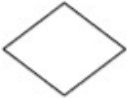The flowchart is a diagram which visually presents the flow of data through processing systems. This means by seeing a flow chart one can know the operations performed and the sequence of these operations in a system. Algorithms are nothing but sequence of steps for solving problems. So a flow chart can be used for representing an algorithm.

A flowchart, will describe the operations (and in what sequence) are required to solve a given problem. You can see a flow chart as a blueprint of a design you have made for solving a problem.

Flowchart Symbols

There are 6 basic symbols commonly used in flowcharting of assembly language Programs:
- Terminal,
- Process,
- input/output,
- Decision,
- Connector and
- Predefined Process.

| Symbol	Name	Function
	Process	Indicates any type of internal operation inside the Processor or Memory
	input/output	Used for any Input / Output (I/O) operation. Indicates that the computer is to obtain data or output results
	Decision	Used to ask a question that can be answered in a binary format (Yes/No, True/False)
	Connector	Allows the flowchart to be drawn without intersecting lines or without a reverse flow.
	Predefined Process	Used to invoke a subroutine or an Interrupt program.
	Terminal	Indicates the starting or ending of the program, process, or interrupt program
	Flow Lines	Shows direction of flow.

Problem 1 : Flowchart to calculate the area of circle.
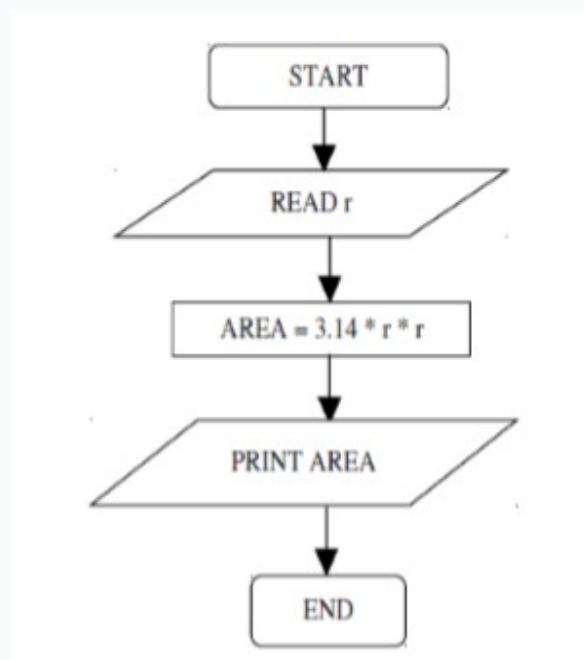
Problem 2: Convert temperature Fahrenheit to Celsius.

```
        ┌─────────────┐
        │    START    │
        └─────────────┘
               │
               ▼
        ╱─────────────╱
       ╱   READ F    ╱
      ╱─────────────╱
               │
               ▼
        ┌─────────────────────┐
        │ C = 5/9 * (F – 32)  │
        └─────────────────────┘
               │
               ▼
        ╱─────────────╱
       ╱  PRINT C    ╱
      ╱─────────────╱
               │
               ▼
        ┌─────────────┐
        │     END     │
        └─────────────┘
```
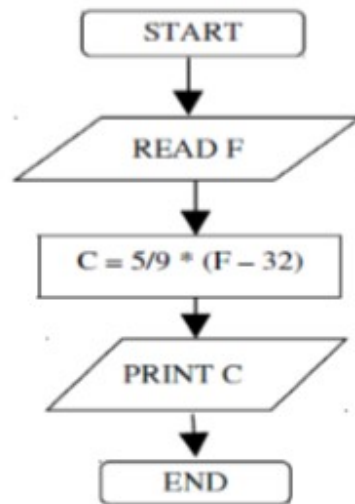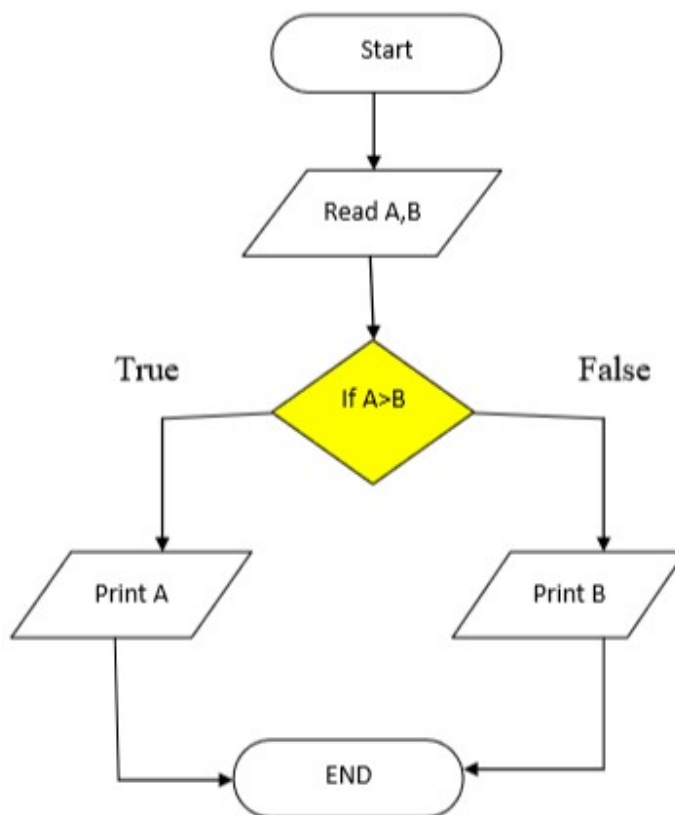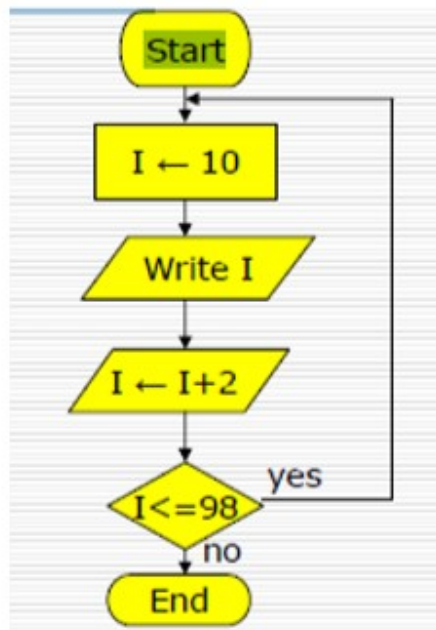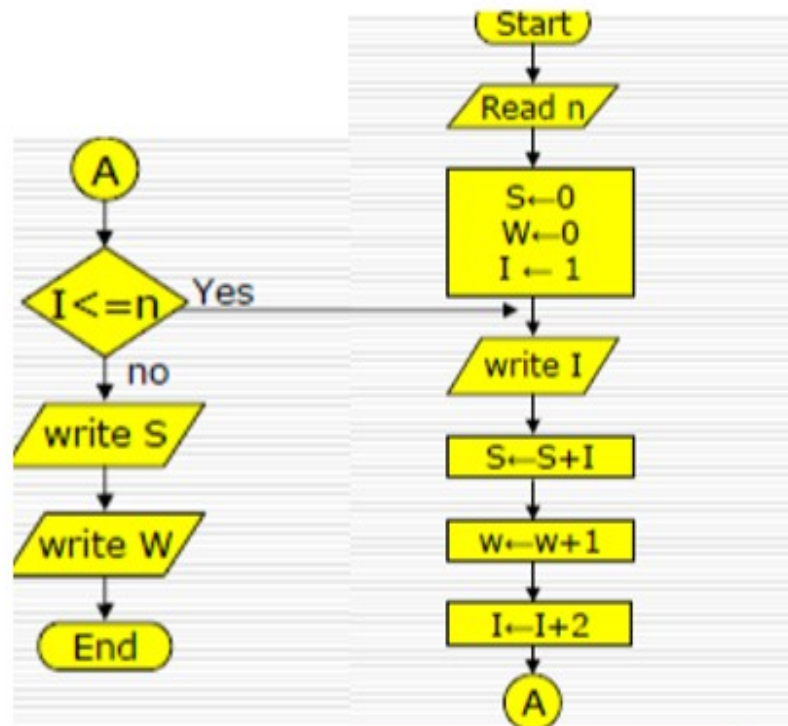
Problem 3: Flowchart to find the greatest from 2 numbers.

```
                    ┌──────────┐
                    │  Start   │
                    └──────────┘
                         │
                         ▼
                   ╱────────────╱
                  ╱  Read A,B  ╱
                 ╱────────────╱
                         │
                         ▼
   True              ◇ If A>B ◇              False
     ┌──────────────────┘ └──────────────────┐
     ▼                                        ▼
 ╱─────────╱                            ╱─────────╱
╱ Print A ╱                            ╱ Print B ╱
╱─────────╱                            ╱─────────╱
     │                                        │
     └──────────┐        ┌──────────────────┘
                ▼        ▼
            ┌──────────────┐
            │     END      │
            └──────────────┘
```
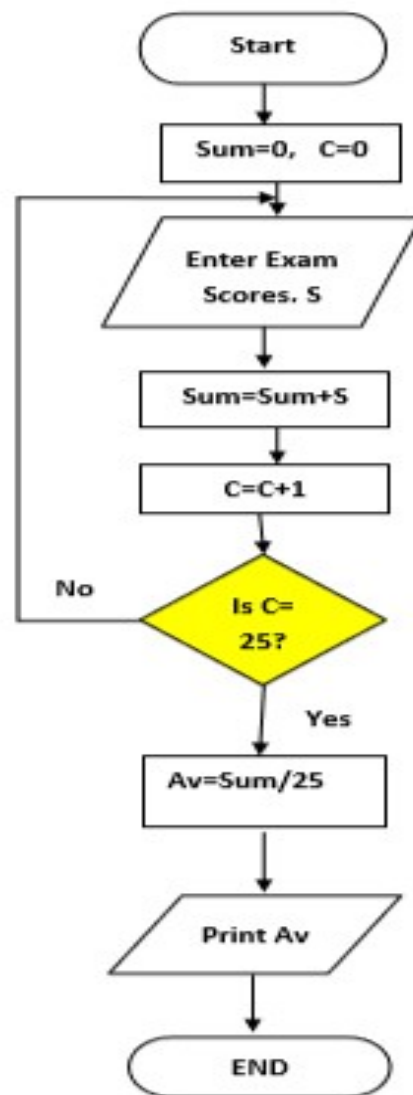
Problem 4: Flowchart to print the Even numbers between 9 and 100.

Problem 5: Flowchart for printing odd numbers less than a given number. It should also calculate their sum and count.

Problem 6 : Flowchart for the calculate the average from 25 exam scores.

Assignments

1. Draw a flowchart to find the sum of first 100 natural numbers.
2. Draw a flow chart to find the largest of 3 numbers.
3. Draw a flowchart for check a given number is prime or not.