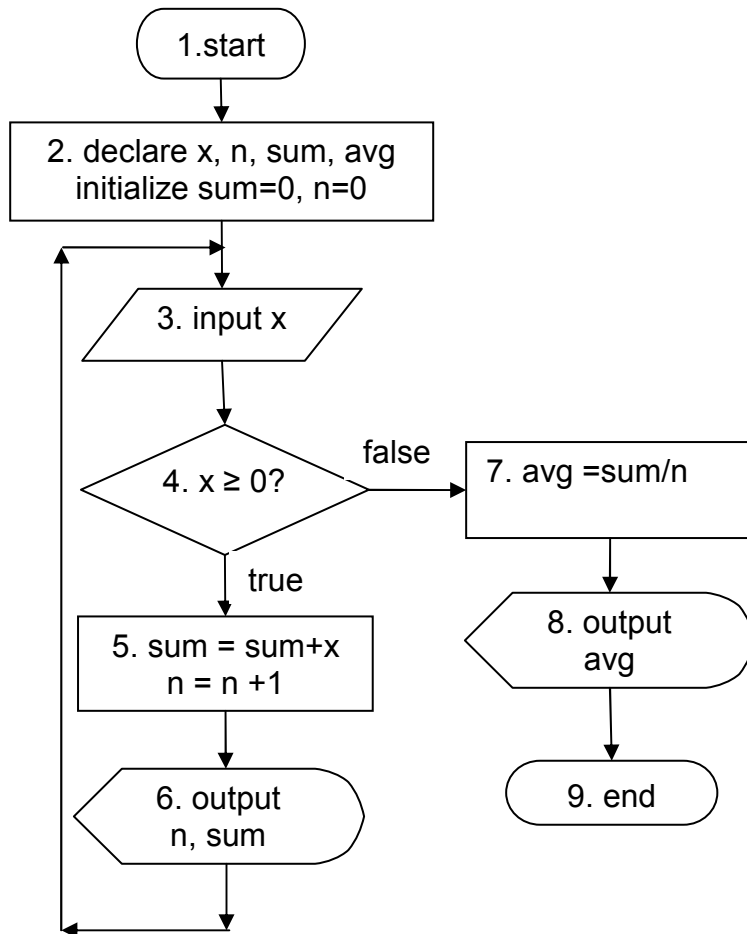


Coursework 2 – Flowchart

- Submission: hardcopy (printed or handwritten with a coversheet) and softcopy (electronic files to CitySpace), if all or part of the hardcopy is printed from a file (CW2\_your\_name.doc).
- Due date: 03/11/2008

Q1 (10 marks) Convert the letters in your surname to numbers using the alphabetic order, i.e. A-1, B-2,.....Z-26.

1. Use the first 4 numbers as the input to x to show how the program is executed, including the program flow, changes of values in the variables and the program output.
2. How to terminate the program to get the avg(average)?



Q1 Flowchart

For example:

Name: Yan

Input to x: 25, 1, 14

Show how the program is executed:

1. start the program
2. declare variables  $x$ ,  $n=0$ ,  $sum=0$ ,  $avg$
3. input  $x$ :  $x=25$
4.  $x \geq 0$  is true, go to box 5
5.  $sum=sum+x=0+25=25$   
 $n = n + 1 = 0 + 1 = 1$
6. output  $n=1$ ,  $sum=25$  ----- (go to box 3)
3. input  $x$ :  $x=1$
4.  $x \geq 0$  is true, go to box 5
5.  $sum=sum+x=25+1=26$   
 $n = n + 1 = 1 + 1 = 2$
6. output  $n=2$ ,  $sum=26$  ----- (go to box 3)
3. input  $x$ :  $x=14$
4.  $x \geq 0$  is true, go to box 5
5.  $sum=sum+x=26+14=40$   
 $n = n + 1 = 2 + 1 = 3$
6. output  $n=3$ ,  $sum=40$  ----- (go to box 3)

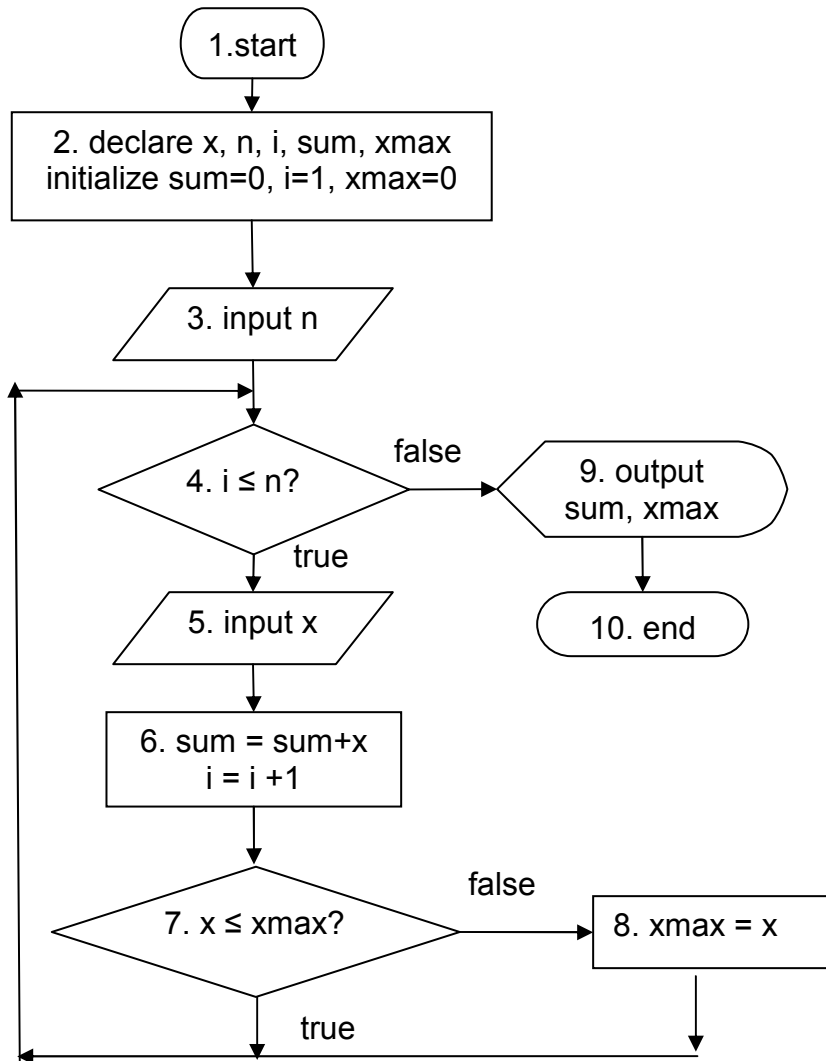
Q2 (30 marks) Convert the first 4 letters in your surname to numbers using the alphabetic order, i.e. A-1, B-2,.....Z-26. Use the numbers as the input to x to show how the program is executed, including the program flow, changes of values in the variables and the program output. The input n is the number of letters (capped at 4) in the surname or the number of x values.

For example:

Name: Yan

Input to n: 3

Input to x: 25, 1, 14



Q2 Flowchart

Q3 (30 marks) Write a flowchart for a program which reads 5 numbers from keyboard and calculate the mean value of those 5 numbers.

Choose any 5 numbers as the input and show how the program is executed.

Q4 (30 marks) Write a flowchart for a program which calculates the following addition:

$$\text{sum} = 1^1 + 2^2 + 3^3 + \dots + n^n$$

where, n is a positive integer number entered via keyboard. If n is less than 1, display an error message and ask the user to re-enter a number for n.

Show how the program is executed for

1. n = 0
2. n = 3