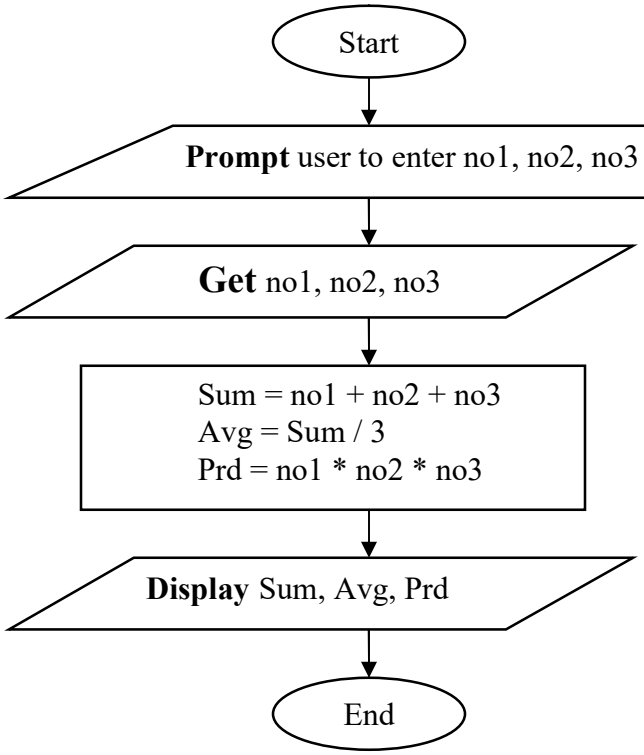
ملحق الأمثلة والتمارين

أولاً: الأمثلة

Example

Flowchart and the equivalent Pseudo code to compute the sum, average and product of three numbers:



1. Begin
2. **Prompt** user to enter no1, no2, no3
3. **Get** no1, no2, no3
4. Sum ← no1 + no2 + no3
5. Avg ← Sum / 3
6. Prd ← no1 * no2 * no3
7. **Display** Sum, Avg, Prd
8. End

//

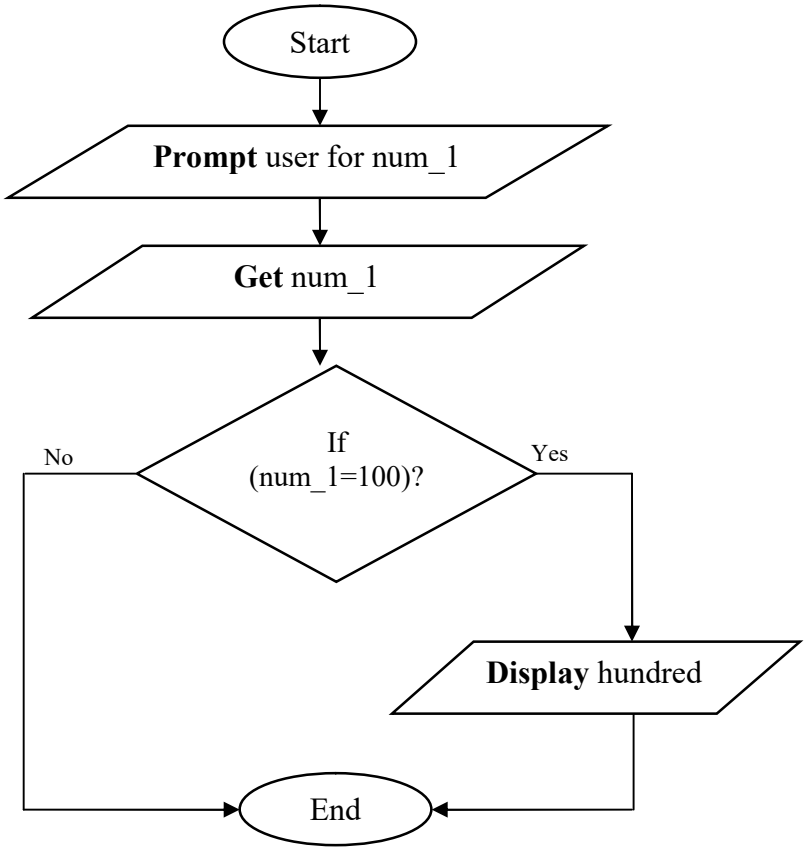
Example:

The following code out word "hundred" if the value stored in the *num_1* variable is equal 100:

1. Pseudo code

1. Begin
2. **Prompt** user for num_1
3. **Get** num_1
4. **If** (num_1=100)
   Display hundred
   EndIf
5. End

2. Flowchart



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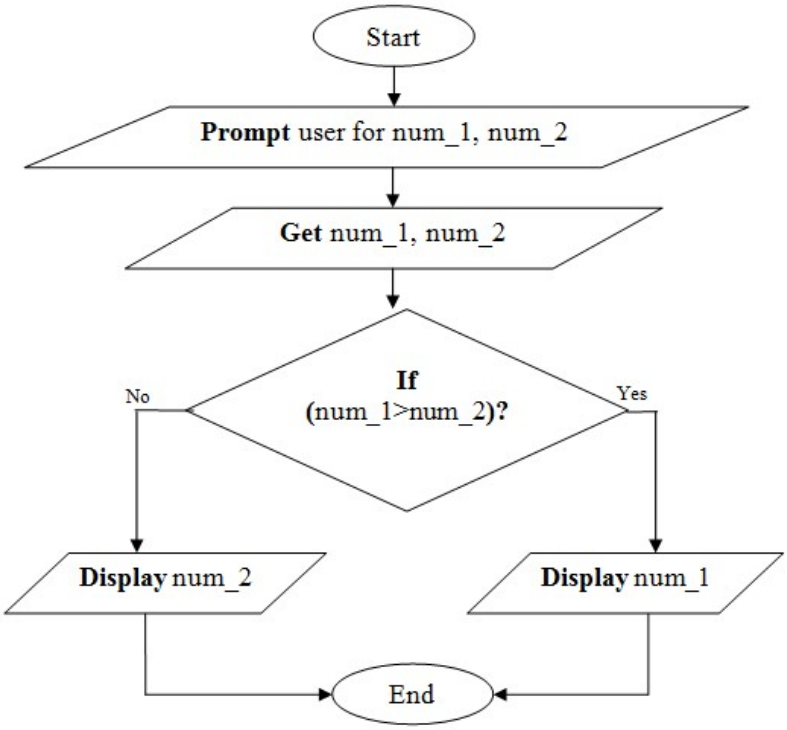
Example:

The following code output num_1 if it is greater than num_2 otherwise output num_2:

1. Pseudocode:

```
1. Begin
2. Prompt user for num_1 , num_2
3. Get num_1 , num_2
4. If (num_1 > num_2)
        Display num_1
   Else
        Display num_2
   EndIf
5. End
```

2. Flowchart



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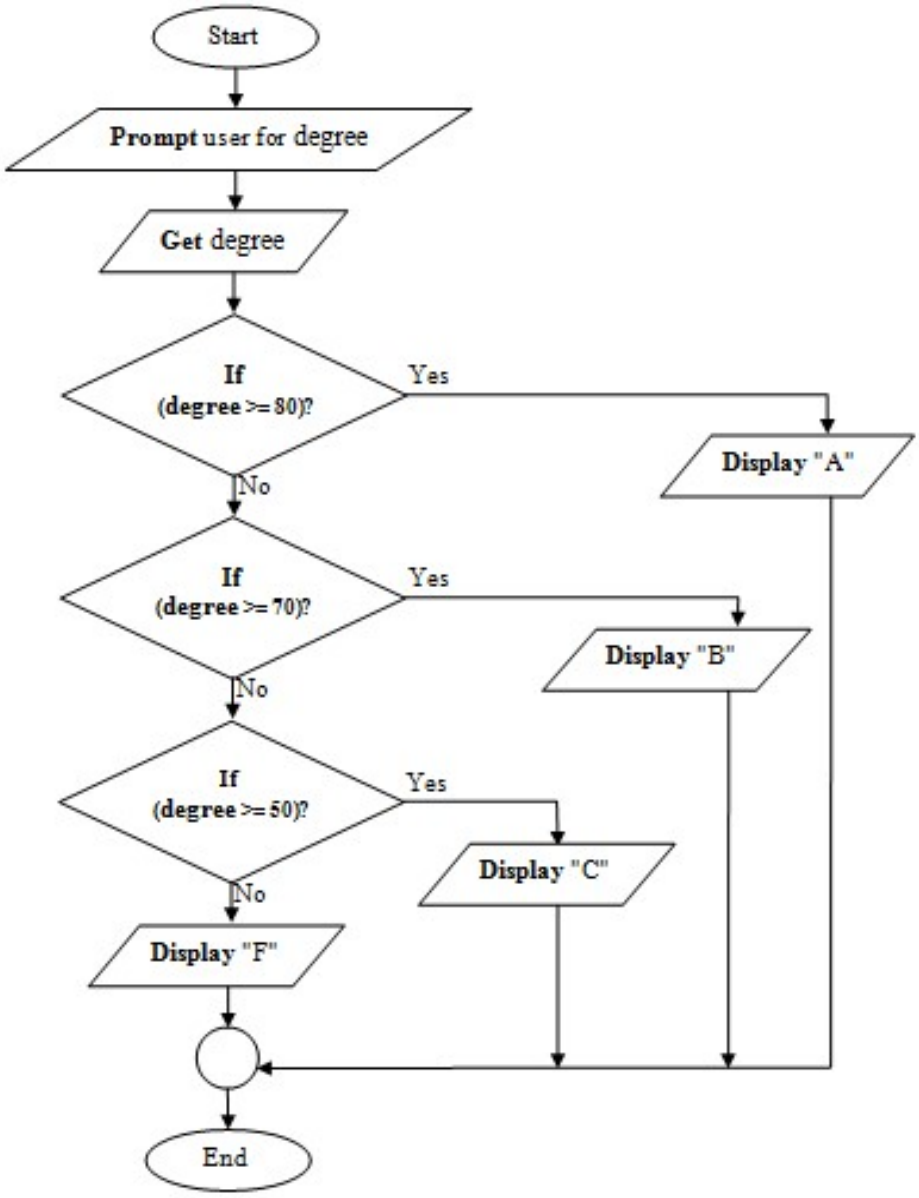
Example for nested if:

The following pseudo code and the flow chart represents student's grade which depend on his degree:

1. Begin
2. **Prompt** user to enter student's degree
3. **Read** grade
4. **If** student's degree is greater than or equal to 80
   Write "A"
   elseIf student's degree is greater than or equal to 70
   Write "B"
   elseIf student's degree is greater than or equal to 50
   Write "C"
   else
   Write "F"
   EndIf
5. End



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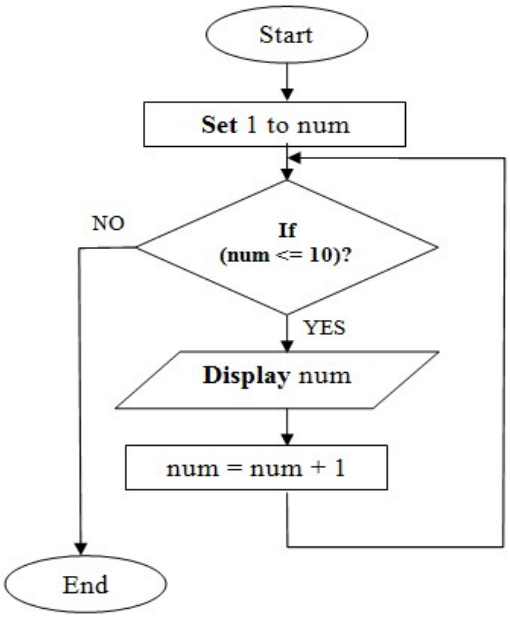
Example:

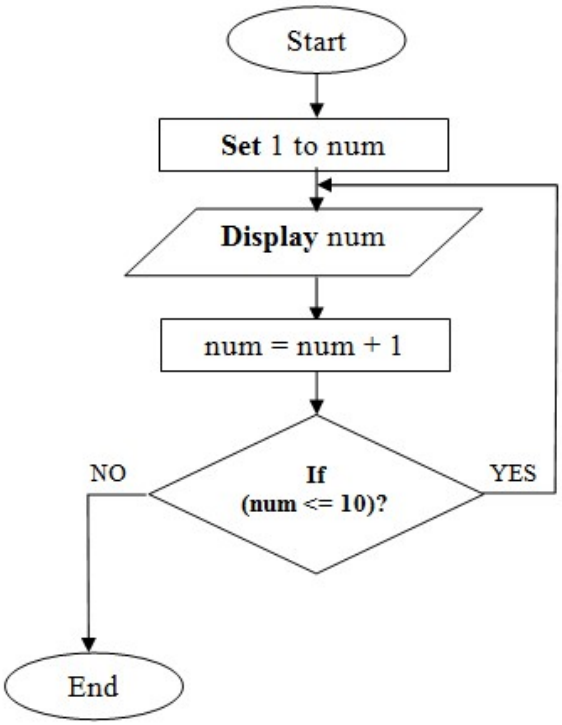
Write a program that output number from 1 to 10 using the two alternative solutions (The Pre-Test Loop, the Post-Test Loop and Counted loop):

The Pre-Test Loop:



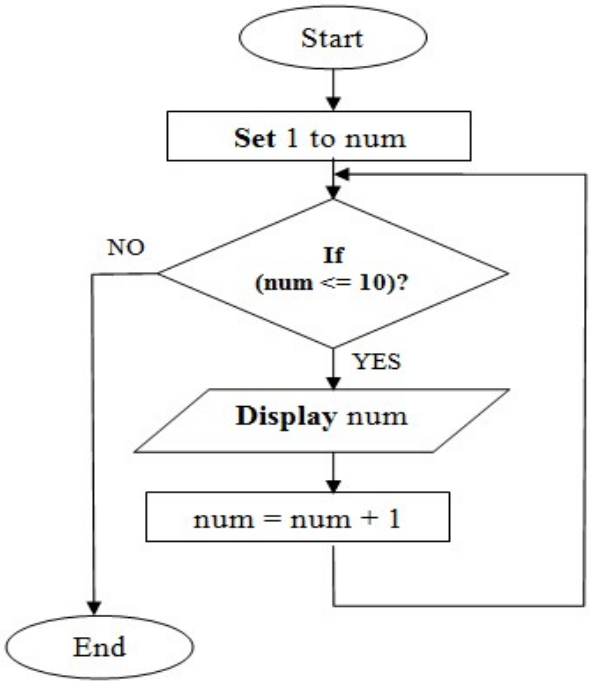
1. Begin
2. **Set** 1 to num
3. **While** (num <= 10)
   Display num
   num = num + 1
   EndLoop
4. End

The Post-Test Loop:



1. Begin
2. **Set** 1 to num
3. **Do**
   Display num
   num = num + 1
   While (num <= 10)
4. End

The Counted Loop:



1. Begin
2. **For** num = 1 **to** 10
   Display num
   num = num + 1
   EndLoop
4. End

//

Example:

Write pseudo code to input array of seven elements and output it:

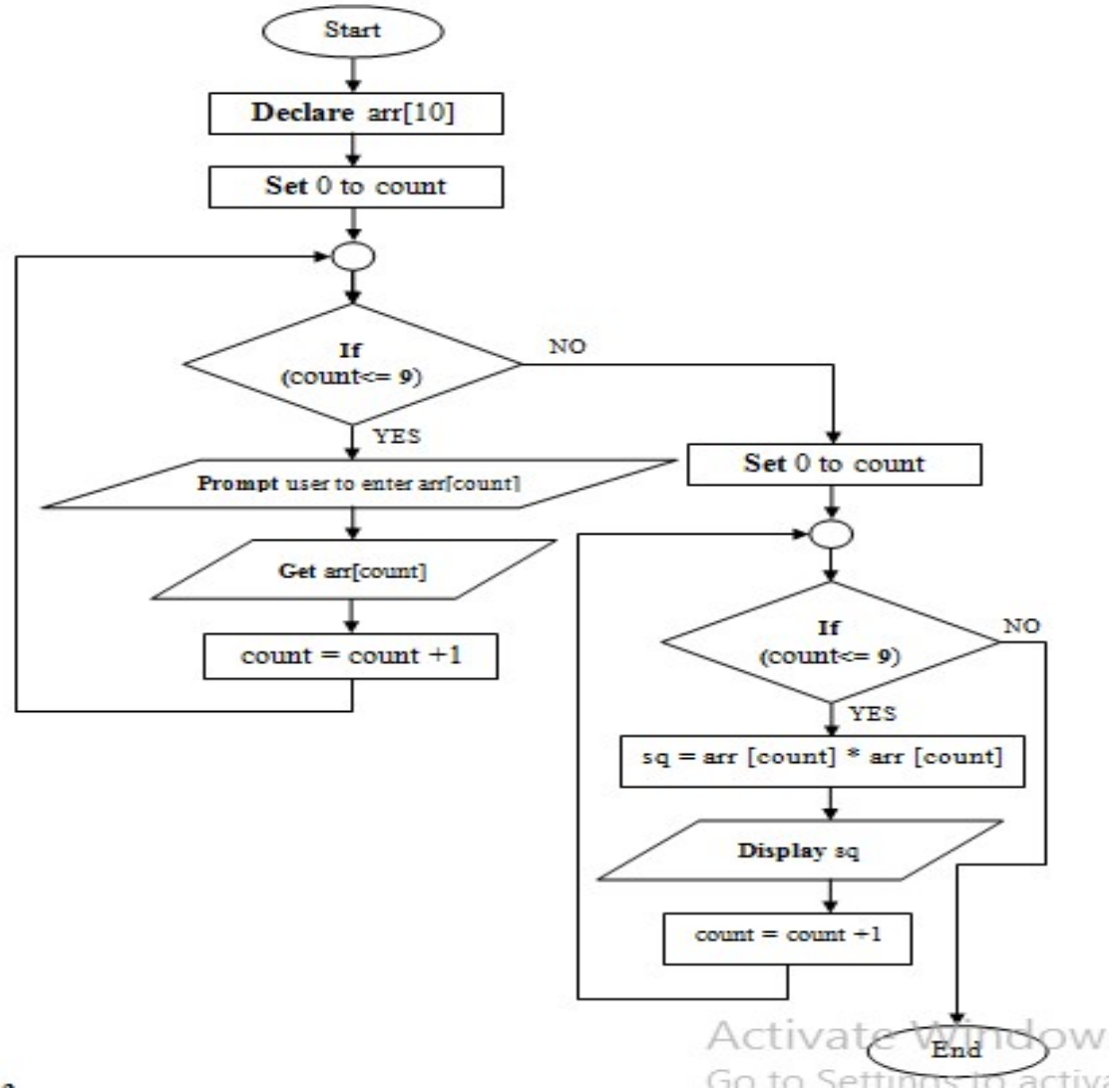
1. **Begin**
2. **Declare** myArr[7]
3. **For** k = 0 to 6
   Prompt user to enter myArr[k]
   Get myArr[k]
   k = k + 1
   EndLoop
4. For t = 0 to 6
   Display myArr[t]
   t = t +1
   EndLoop
5. **End**

//

Example:

Write pseudo code and draw a flow chart to input 10 numbers in array, and output their square.

1. **Begin**
2. **Declare** arr[10]
3. **For** count = 0 to 9
   Prompt user to enter arr[count]
   Get arr[count]
   count =count + 1
   EndLoop
4. **For** count = 0 to 9
   sq = arr [count] * arr [count]
   Display sq
   count =count + 1
   EndLoop
5. **End**



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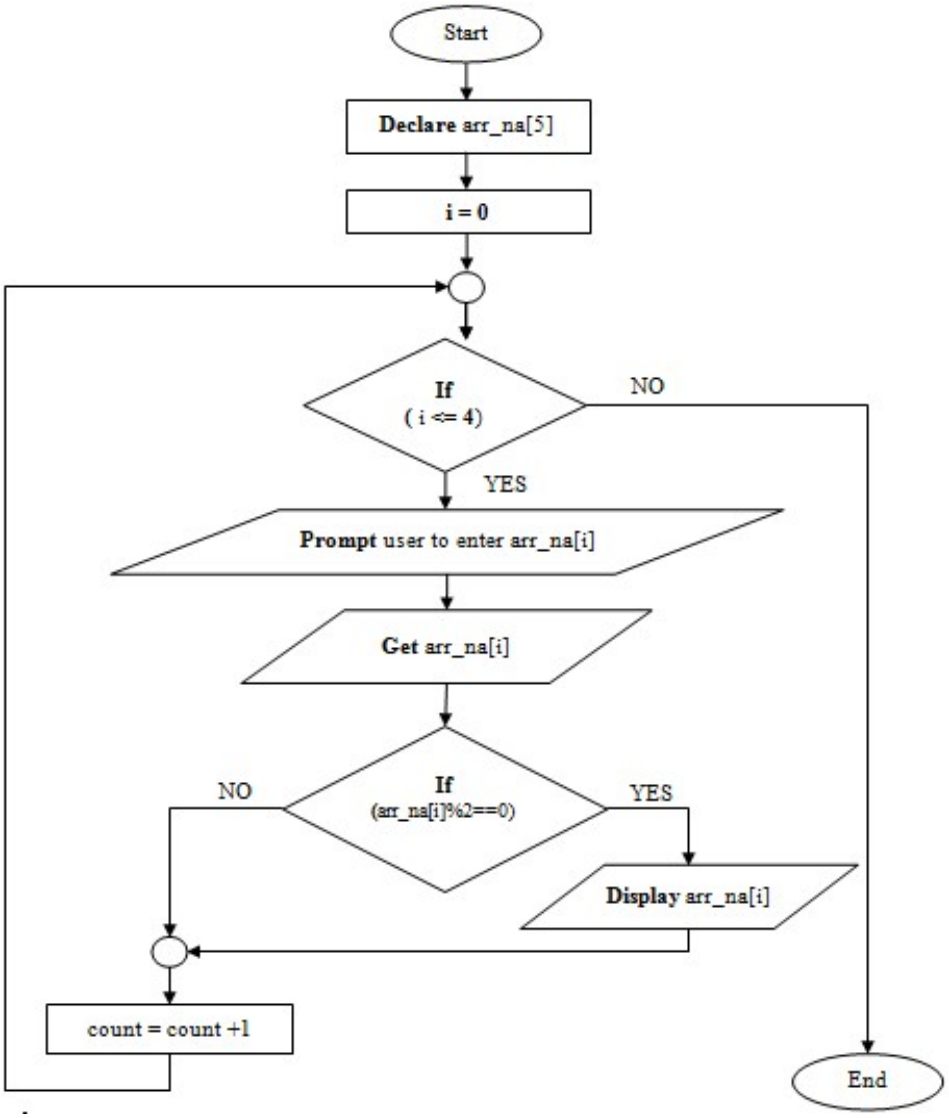
Example:

Write pseudo code and draw flowchart to display the even elements in the array of five elements.



1. **Begin**
2. **Declare** arr_na[5]
3. **For** i = 0 to 4
   Prompt user to enter arr_na[i]
   Get arr_na[i]
   If (arr_na[i]%2 = = 0)
   Display arr_na[i]
   i = i + 1
   EndLoop
4. **End**

ثانياً: التمارين

Homework number (1)

Write the pseudo codes do the following:

1. Calculate the summation of three numbers no1, no2, no3
    1. Begin
    2. **Prompt** user for no1, no2, no3
    3. **Get** no1, no2, no3
    4. sum = no1 + no2 + no3
    5. **Display** sum
    6. End

2. Compute the product of three numbers no1, no2, no3
    1. Begin
    2. **Prompt** user for no1, no2, no3
    3. **Get** no1, no2, no3
    4. Product = no1 * no2 * no3
    5. **Display** Product
    6. End

3. Find the average of three numbers no, no2, no3
    1. Begin
    2. **Prompt** user for no, no2, no3
    3. **Get** no, no2, no3
    4. sum = no + no2 + no3
    5. average = sum / 3
    6. **Display** average
    7. End

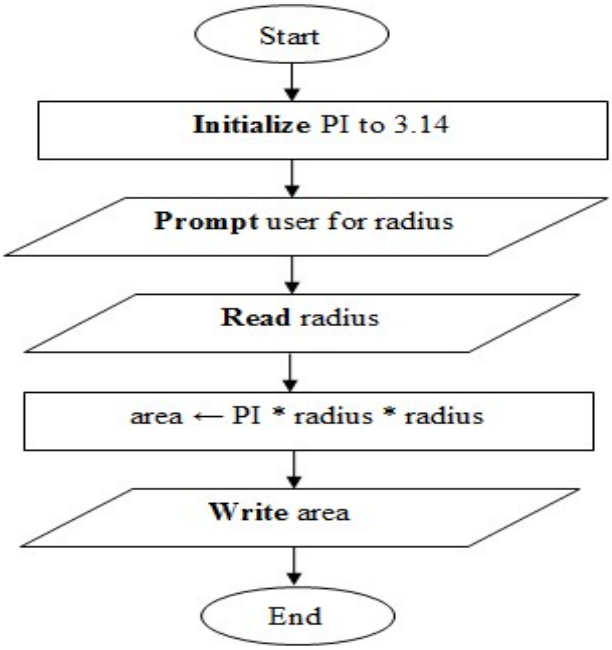
4. Calculate the summation, average and product of three numbers no, no2, no3
    1. Begin
    2. **Prompt** user for no, no2, no3
    3. **Get** no, no2, no3
    4. sum = no + no2 + no3
    5. Product = no * no2 * no3
    6. average = sum / 3
    7. **Display** sum, Product**,** average
    8. End

Homework number (2)

Convert the following pseudo codes to equivalent flow charts:

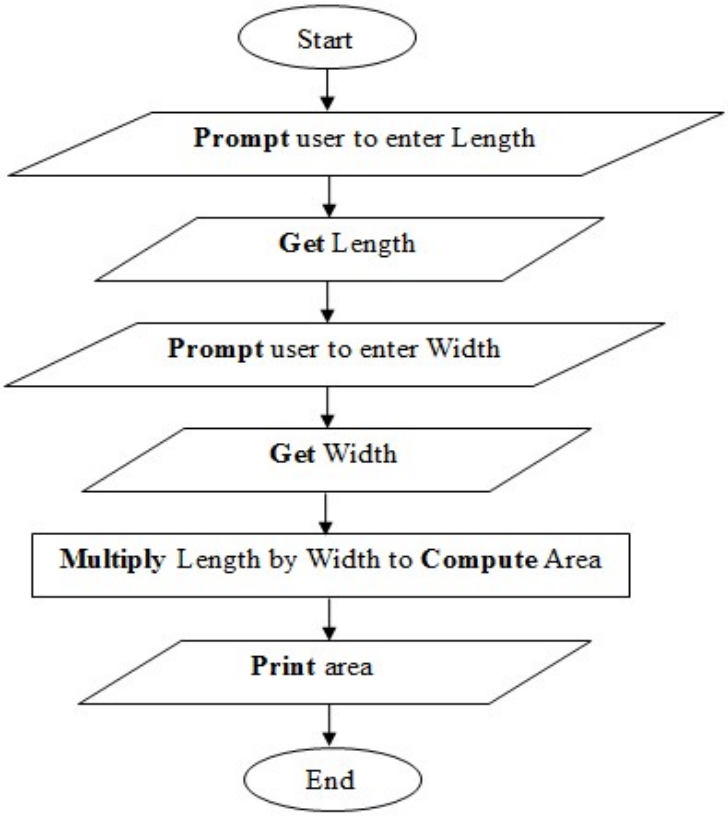
1) Pseudo code to Calculates the Circle area

1. Begin
2. **Initialize** *PI* to 3.14
3. **Prompt** user to enter radius
4. **Read** radius
5. area ← *PI* * radius * radius
6. **Write** area
7. End



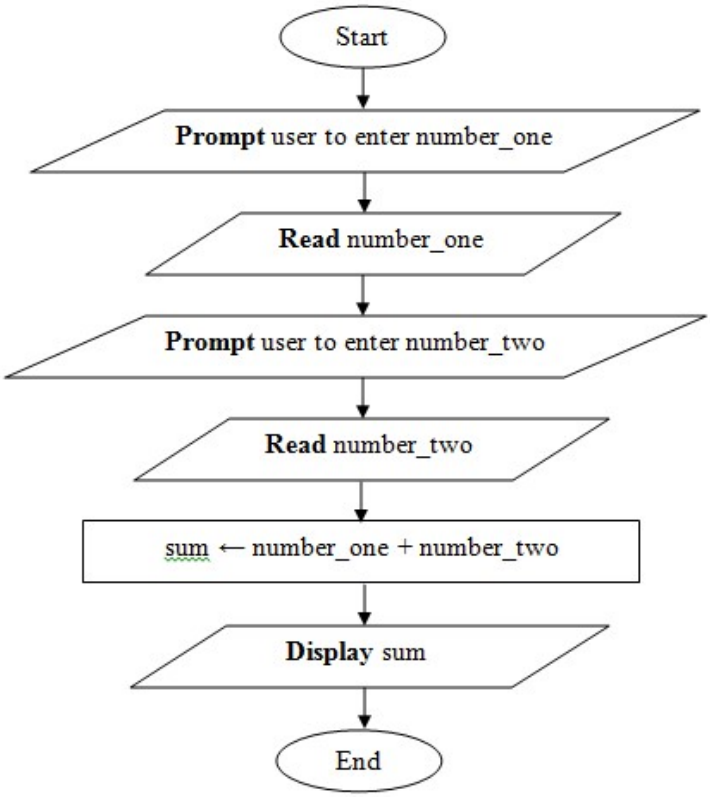
2) Pseudo code to Calculates the Rectangle area

1. Begin
2. **Prompt** user to enter Length
3. **Get** Length
4. **Prompt** user to enter Width
5. **Get** Width
6. **Multiply** Length by Width to **Compute** Area
7. **Print** Area
8. End



3) Pseudo code to finds the Summation of two numbers

1. Begin
2. **Prompt** user to enter number_one
3. **Read** number_one
4. **Prompt** user to enter number_two
5. **Read** number_two
6. sum ← number_one + number_two
7. **Display** sum
8. End



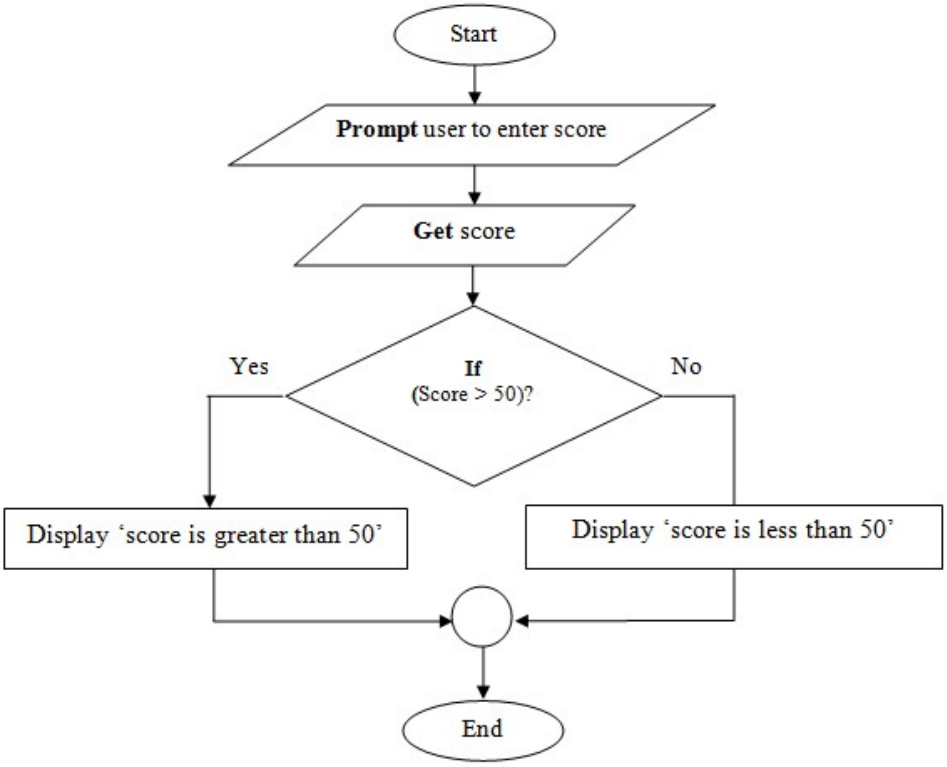
Homework number (3)

A. Type an algorithm shows if the score variable is greater than 50 or not, and output the appropriate message(write pseudo code and a flowchart).

pseudo code:

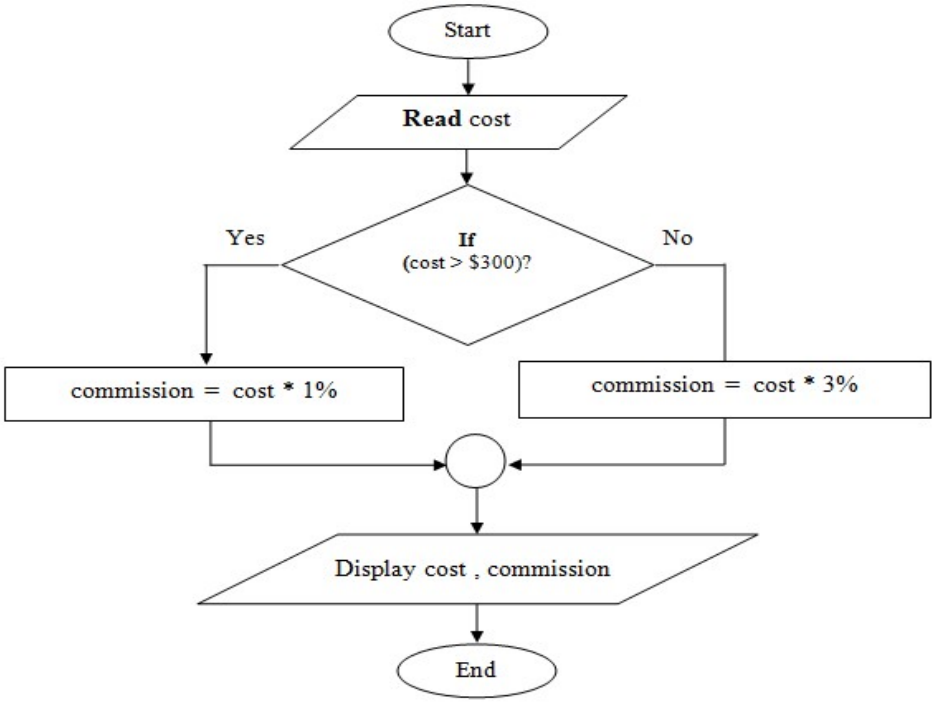
1. **Begin**
2. **Prompt** user to Enter score
3. **Get** score
4. **IF** score > 50 THEN
   Display 'score is greater than 50'
   else
   Display 'score is less than 50'
   EndIf
5. **End**

flowchart

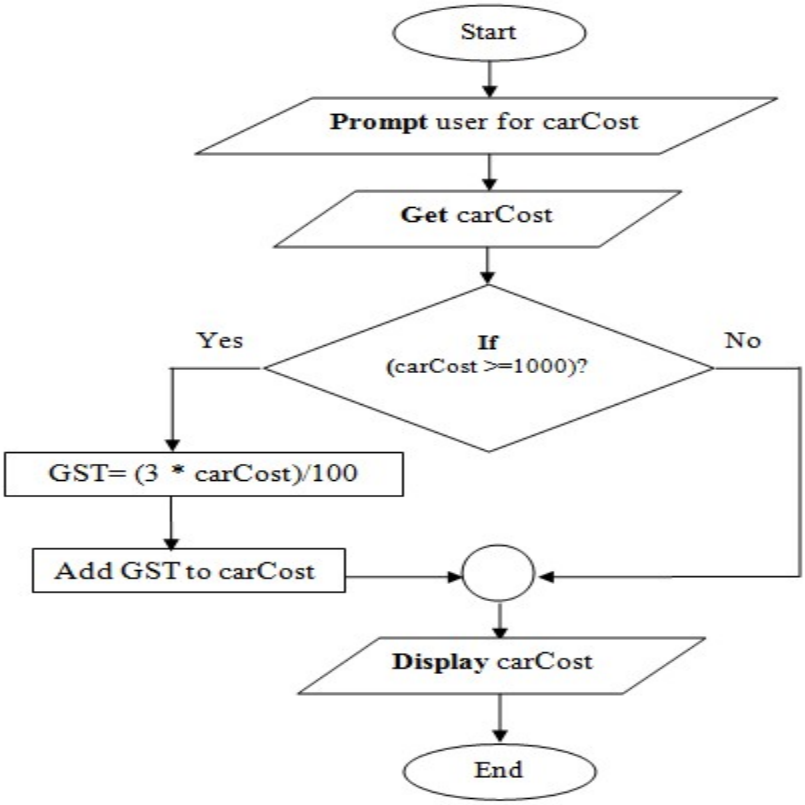


B. Convert the following pseudo code to a flowchart

6. **Begin**
7. **Read** cost
8. **IF** cost is >= $300 THEN
   Calculate commission = cost * 1%
   elseIf
   Calculate commission = cost * 3%
   EndIf
9. **Display** cost , commission
10. **End**



C. Convert the following flowchart to pseudo code



1. **Begin**
2. Prompt user for carCost
3. **Get** carCost
4. **IF** carCost is >= 1000 THEN
   GST = (3 * carCost)/100
   carCost = carCost + GST
   EndIf
5. **Display** carCost
6. **End**

Homework number (4)

1. By using for loop write pseudo code print line of five stars, after that draw flowchart.

   1. Begin
   2. **For** i=1 to 80
      Display '*'
      i = i +1
      EndLoop
   3. **End**

2. Write a program that output number from 1 to 10 every number followed by star, using the two alternative solutions (The Pre-Test Loop, the Post-Test Loop and Counted loop)

   The Pre-Test Loop

   1. Begin
   2. Set i to 1
   3. **While(** i<= 10)
      Display i, '*'
      i = i +1
      EndLoop
   4. **End**

   The Post-Test Loop

   1. Begin
   2. Set i to 1
   3. **Do**
      Display i, '*'
      i = i +1
      While(i<= 10)
      EndLoop
   4. **End**

Counted loop

1. Begin
2. **For** i=1 to 10
   Display i,'*'
   i = i +1
   EndLoop
3. **End**

Homework number (5)

1) Write a pseudo code and flowchart to display the multiplication table for number four.

1. Begin
2. For h = 1 to 12
   Display '4*', h,' = ', h*4
   h = h + 1
   EndLoop
3. End

2) Modify question (1) to display the multiplication table for number entered by the user.

1. Begin
2. Get num
3. For h = 1 to 12
   Display num,'*', h,' = ', h*num
   h = h + 1
   EndLoop
4. End

3) Write a pseudo code and draw flow chart to read ten numbers and compute their average using iterations.

1. Begin
2. Set sum to 0
3. For i = 1 to 10
   Get num
   sum = sum + num
   i = i + 1
   EndLoop
4. avg = sum/i
5. Display avg
6. End

Homework number (6)

1) Write a pseudo code and draw a flow char using nested loops structure to display the following:

a)

1
1 2
1 2 3
1 2 3 4

1. Begin
2. **For** i=1 to 4
   Set j to 1
   While (j <= i)
   Display j
   j = j+ 1
   EndLoop
   i = i +1
   Display NewLine
   EndLoop
3. **End**

//

b)

***
**
*
**
***

1. Begin
2. **For** i=3 to 1
   Set j to 1
   While (j <= i)
   Display '*'
   j = j+ 1
   EndLoop
   i = i - 1
   Display NewLine
   EndLoop
3. **For** i=2 to 3
   Set j to 1
   While (j <= i)
   Display '*'
   j = j+ 1
   EndLoop
   i = i +1

```
        Display NewLine
    EndLoop
4. End
```

//

c)

```
1
22
333
4444
55555
```

```
1. Begin
2. For i=1 to 5
        Set j to 1
        While (j <= i)
            Display i
            j = j+ 1
        EndLoop
        i = i +1
        Display NewLine
   EndLoop
3. End
```

//

d)

```
*?????
*?????
*?????
```

```
1. Begin
2. For i=1 to 3
        Display '*'
        Set j to 1
        While (j <= 5)
            Display '?'
            j = j+ 1
        EndLoop
        i = i +1
        Display NewLine
   EndLoop
3. End
```

//

e)

```
* * * * *
* * * *
* * *
* *
*
```

1. Begin
2. **For** i=5 to 1
   Set j to 1
   While (j <= i)
   Display '*'
   j = j+ 1
   EndLoop
   i = i - 1
   Display NewLine
   EndLoop
3. **End**

//

Homework number (7)

1) Write a pseudo code and draw a flowchart to output the summation one-dimensional array of six elements.

1. **Begin**
2. **Set** sum to 0
3. **Declare** arr[6]
4. **For** count = 0 to 5
   Prompt user to enter arr[count]
   Get arr[count]
   sum = sum + arr[count]
   count =count + 1
   EndLoop
5. **Display** sum
6. **End**

2) Write a pseudo code and draw a flowchart to output the one-dimensional array of ten elements in reverse order.

```
1. Begin
2. Declare arr[10]
3. For count = 0 to 9
       Prompt user to enter arr[count]
       Get arr[count]
       count =count + 1
   EndLoop

4. For count = 9 to 0
       Display arr [count]
       count =count + 1
   EndLoop
5. End
```

3) Write a pseudo code and draw a flowchart that add one-dimensional array (A) to one-dimensional array (B) in one-dimensional array(C), suppose the array A,B and C have size of nine elements.

```
1. Begin
2. Declare A[9]
3. Declare B[9]
4. Declare C[9]

5. For count = 0 to 8
       Get A[count]
       count =count + 1
   EndLoop

6. For count = 0 to 8
       Get B[count]
       count =count + 1
   EndLoop

7. For count = 0 to 8
       C[count] = A[count] + B[count]
       count =count + 1
   EndLoop

8. For count = 0 to 8
       Display C [count]
       count =count + 1
   EndLoop
9. End
```

4) Write a pseudo code and draw a flowchart that displays the maximum and minimal value in one-dimensional array that have size five elements.

1. **Begin**
2. **Declare** arr[5]
3. **Set** maximum to 0
4. **Set** minimal to 0

5. **For** count = 0 to 4
   Prompt user to enter arr[count]
   Get arr[count]
   count =count + 1
   EndLoop

6. maximum = arr[0]
7. minimal = arr[0]

8. **For** count = 0 to 4
   if(arr[count] > maximum**)**
   maximum = arr[count]
   endif

   if(arr[count] < minimal**)**
   minimal = arr[count]
   endif

   count =count + 1
   EndLoop
9. **Display** maximum, minimal
10. **End**

Homework number (8)

1) write a pseudo code and draw a flowchart to display the summation of each row in two-dimension array of three rows and three columns, for example if you input values like the figure below

2	8	7
5	5	1
4	3	9

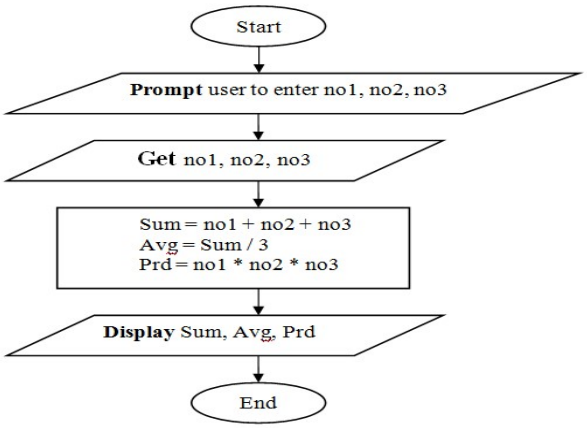
The output should like this:

17
11
16

1. **Begin**
2. **Declare** arrNum[3][3]
3. **Set** summation to 0
4. **For** i = 0 to 2
   For k = 0 to 2
   Prompt user to enter arrNum[i][k]
   Get arrNum[i][k]
   k = k +1
   EndLoop
   i = i + 1
   EndLoop

5. **For** i = 0 to 2
   summation = 0
   For k = 0 to 2
   summation = summation + arrNum[i][k]
   k = k +1
   EndLoop
   Display summation
   Display NewLine
   i = i + 1
   EndLoop
6. **End**

Write the output of the following algorithms

Algorithms	Output
1. Begin 2. Prompt user to enter for number_one 3. Get number_one 4. Prompt user for to enter number_two 5. Get number_two 6. sum ← number_one + number_two 7. Display sum 8. End	<u>The output if user enter 3 and 4</u> enter for number_one 3 enter number_two 4 7
	<u>The output if user enter 3,2 and 4</u> enter no1, no2, no3 3 2 4 9 3 24
1. Begin 2. For num = 1 to 12 Display num,"* 3 = ",num*3 num = num + 1 EndLoop 4. End	1*3=3 2*3=6 3*3=9 4*3=12 5*3=15 6*3=18 7*3=21 8*3=24 9*3=27 10*3=30 11*3=33 12*3=36
1. Begin 2. For i = 1 to 3 For j = 1 to 4 Display j j = j + 1 EndLoop i = i + 1 Display NewLine EndLoop **3.** End	1 2 3 4 1 2 3 4 1 2 3 4