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| **Experiment No.** | 2 |

| **AIM:** | Apply various control structures to solve given problems. |
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| **Program 1** | |
| **PROBLEM STATEMENT :** | Write a program to calculate grade for given marks. |
| **ALGORITHM:** | 1) INITIALIZE **:** M  2)INPUT **:** M  3) IF (M>100) THEN PRINT “Invalid Marks”  ELSE IF(M>=90 & M<=100) PRINT"'A' grade"  ELSE IF(M>=80 & M<90) PRINT"'B' grade"  ELSE IF(M>=70 & M<80) PRINT"'C' grade"  ELSE IF(M>=60 & M<70) PRINT"'D' grade"  ELSE PRINT"You have failed!"  END IF |
| **FLOWCHART:** |  |
| **PROGRAM:** | #include <stdio.h>  int main()  {  int m;  printf("Enter your marks :");  scanf("%d", &m);  if (m>100)  printf("Invalid marks");  else if(m>=90 && m<=100)  printf("'A' grade");  else if(m>=80 && m<90)  printf("'B' grade");  else if(m>=70 && m<80)  printf("'C' grade");  else if(m>=60 && m<70)  printf("'D' grade");  else  printf("You have failed!");  return 0;  } |
| **RESULT:** | |
| **Program 2** | |
| **PROBLEM STATEMENT :** | Write a program to calculate factorial of a given number. |
| **ALGORITHM:** | 1) INITIALIZE : I  2) INPUT : I  3) SET : FAC=1  4) WHILE(I>0) SET “FAC=FAC\*I, I=I-1”  END WHILE  5) PRINT “FAC” |
| **FLOWCHART:** |  |
| **PROGRAM:** | #include <stdio.h>  int main()  {  int i,fac=1;  printf("Enter a whole number :");  scanf("%d", &i);  while(i>0)  {  fac=fac\*i;  i--;  }  printf("%d \n",fac);  return 0;  } |
| **RESULT:** | |
| **Program 3** | |
| **PROBLEM STATEMENT:** | Write a program to count no. of digits and reverse the number. |
| **ALGORITHM:** | 1) INITIALIZE : N  2) INPUT : N  3) SET : CNT=0  4) WHILE (N!=0) PRINT “N%10”, SET “N=N/10, CNT=CNT+1”  END WHILE  5) PRINT “Number of digits in the number are : ‘CNT’ ” |
| **FLOWCHART:** |  |
| **PROGRAM:** | #include <stdio.h>  int main ()  {  int n,cnt=0;  printf("Enter a number :");  scanf("%d",&n);  while(n!=0)  {  printf("%d",n%10);  n=n/10;  cnt++;  }  printf("\nNumber of digits in the entered number : %d",cnt);  return 0;  } |
| **RESULT:** | |
| **Program 4** | |
| **PROBLEM STATEMENT:** | Write a program to calculate factorial of a given number using for loop. |
| **ALGORITHM:** | 1) INITIALIZE : N  2) SET : FAC=1  3) INPUT : N  4) FOR(N>0) SET “FAC=FAC\*N, N=N-1”  END FOR LOOP  5) PRINT “Factorial of entered number is : FAC” |
| **FLOWCHART:** |  |
| **PROGRAM:** | #include <stdio.h>  int main ()  {  int n, fac=1;  printf("Enter a number :");  scanf("%d", &n);  for(;n>1;)  {  fac=fac\*n;  n--;  }  printf("Factorial of entered number is : %d",fac);  return 0;  } |
| **RESULT:** | |
| **Program 5** | |
| **PROBLEM STATEMENT:** | Write a menu driven program for calculating area of shapes. |
| **ALGORITHM:** | 1) INITIALIZE : x, l, br, h, b, r  2) PRINT “1.Area of circle  2.Area of Rectangle  3.Area of Triangle  4.Exit  Enter your choice : ”  3) INPUT : x  4) IF (x=1)  INPUT : r  PRINT “Area of circle is val(3.14\*r\*r)”  REPEAT STEP 2    ELSE IF (x=2)  INPUT : l, br  PRINT “Area of rectangle is val(l\*br)”  REPEAT STEP 2  ELSE IF (x=3)  INPUT : b, h  PRINT “Area of triangle is val(0.5\*b\*h)”  REPEAT STEP 2  ELSE IF (x=4)  PRINT “Thank you !!”  END IF  ELSE  PRINT “Wrong Choice !!”  REPEAT STEP 2  END IF |
| **FLOWCHART:** |  |
| **PROGRAM:** | #include <stdio.h>  int main ()  {  int x;  float l,br, h,b,r;  do {  printf("\n1.Area of circle \n2.Area of Rectangle \n3.Area of Triangle \n4.Exit \nEnter your choice :");  scanf("%d", &x);  switch(x)  {  case 1:  printf("Enter radius :");  scanf("%f",&r);  printf("Area of circle is %.2f",3.14\*r\*r);break;  case 2:  printf("Enter length :");  scanf("%f",&l);  printf("Enter breadth :");  scanf("%f",&br);  printf("Area of rectangle is %.2f",l\*br);  break;  case 3:  printf("Enter height :");  scanf("%f",&h);  printf("Enter base :");  scanf("%f",&b);  printf("Area of triangle is %.2f",0.5\*b\*h);  break;  case 4:  printf("Thank you !!");  break;  default :  printf("Wrong Choice !!");  }  }  while(x!=4);  return 0;  } |
| **RESULT:** | |
| **CONCLUSION:** | Studied the application of various control structures to solve given problems. |