Practical - 1

Aim: Write a program to understand the basic datatype and I/O.

Source code:

```
# include <stdio.h>
# include <conio.h>
  Void main (-)
 {
    Char name [50];
    char addr;
    long int mobno;
    float per;
    char grade;
    int rollno;
    clrscr ();
    printf ("**** Demonstration of Datatypes ****");
    printf (" Enter student name \n");
    scanf (" %s", &name);
    printf (" Enter student's address \n");
    scanf (" %s" , & addr);
    printf (" Enter mobile no\n");
    Scanf ("%ld", &mobno);
    printf (" Enter percentage \n");
    Scanf (" %f", &per);
    printf (" Enter grade \n");
    Scanf (" %s", &grade);
```

Output:

**** Demonstration of Datatypes ****

Enter student name

Suyash

Enter student's address

Nallaso

Enter mobile no.

7666470

Enter percentage

81

Enter grade

A

Enter Roll no

1798.

Name : Suyash

Address : Nallaso

Mobile no : 7666470

percentage : 81

Grade : A

Rollno : 1798

```
Printf("Enter Rollno \n");
scanf("%d", &rollno);
printf("\n Name : %s", name);
printf("\n Address : %s", addr);
printf("\n Mobile : %ld", mobno);
printf("\n percentage : %f", per);
printf("\n grade : %c", grade);
printf("\n roll no : %d", rollno);
getch();
}
```

Program - 2.

```
#include <stdio.h>
#include <conio.h>
  void main()
{
    float r;
    float pi = 3.14;
    float area;
    clrscr();
    printf("Enter radius: \n");
    scanf("%f", &r);
    area = pi * r * r;
    printf("Area of circle : %f", area);
    getch();
}
```

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output:

Enter radius:

2

Area of circle: 12.560000

10/12/19

Practical-2

Aim: (a) Write a C program which will show that use of various different types of operators.

* Arithmetic operators

```
# include <conio.h>
# include <stdio.h>
  Void main ()
{
        int num1, num2, add, sum, mul, Div;
        clrscr();
        printf (" Enter 1st number: ");
        scanf ("%d", &num1);
        printf (" Enter 2nd number: ");
        scanf ("%d", &num2);
        add = num1 + num2;
        printf (" Addition of 2 numbers: %d \n", add);
        sub = num1 - num2;
        printf ("Subtraction of 2 numbers: %d \n", sub);
        mul = num1 * num2;
        printf ("multiplication of 2 numbers: %d \n", mul);
        Div = num1 / num2;
        printf (" Division of 2 numbers: %d \n", Div);
        getch();
```

logical operators

```
#include <stdio.h>
#include <conio.h>
  void main()
{
    int x,y,z,value1,value2,value3,value4,value5;
    clrscr();
    printf("Enter 1st value:");
    scanf("%d",&x);
    printf("Enter 2nd number:");
    Scanf("%d",&y);
    printf("Enter 3rd value:");
    scanf("%d",&z);
    value1 = (x<y) && (z>y);
    printf("value1 is: %d \n", value1);
    value2 = (x=y) && (z>y);
    printf("value2 is: %d \n", value2);
    value3 = (x<y) || (z=y);
    printf("value3 is: %d \n", value3);
    value4 = !(x==y);
    printf("value4 is: %d \n", value4);
    value5 = (x==y);
    printf("value5 is: %d \n", value5);
    getch();
}
```

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output

Enter 1st number : 8

Enter 2nd number : 2

Addition of 2 number : 10

Subtraction of 2 number : 6

Multiplication of 2 numbers : 16

Division of 2 numbers : 4

output

Enter 1st value : 9

Enter 2nd number : 8

Enter 3rd value : 2

Value 1 is : 0

Value 2 is : 1

Value 3 is : 1

Value 4 is : 0

Value 5 is : 1

a) Write a program that will demonstate the use of ternary operator

```
#include <stdio.h>
#include <conio.h>
   void main()
{
      int a, b, x;
      clrscr();
      printf(" value of a is :");
      scanf("%d", &a);
      printf(" value of b is :");
      scanf("%d", &b);
      x = (a>b)? a:b;
      printf(" Greater number is : %d \n", x);
      getch();
}
```

07/01/2020

85 output

Value of a is : 16

Value of b is : 1

Greater value is : 16

es

Practical-3

Aim: Write a C program to find whether the entered year is leap year or not

```
#include<stdio.h>
#include<conio.h>
    void main ()
{
    int n;
    clrscr();
    print(" Enter year");
    scanf("%d", &n);
    if (n %4==0)
    {
    printf(" entered year is a leap year")
    }
    else
    {
      printf(" Not a leap year");
```

Algo:

1) Initialize a variable and assign the value in it from user
2) check if it is divided by 4 print appriate message "leap year"
3) else print "not a leap year".

Enter year:
2016
entered year is a leap year

b) Aim: WAP to create a menu driven calculator using switch case statement.

```
#include <stdio.h>
#include <conio.h>
  void main()
{
  char op;
  float num1, num2, result = 0.0;
  printf ("Enter [number1] [+ - * /] [number2] \n");
  scanf ("%f %c %f", &num1, &op, &num2);
  switch (op)
  {
     case '+':
          result = num1 + num2;
          break;
     case '-':
          result = num1 - num2;
          break;
     case '*':
          result = num1 * num2;
          break;
     case '/':
          result = num1 / num2;
          break;
     default:
          printf ("Invalid operator");
  }
  printf ("%.2f %c %.2f = %.2f", num1, op, num2, result);
  getch();
}
```

output:

Enter [number1] [+ - * /] [number2]

2

*

4

2 * 4 = 8

Algo:

1) include appropriate libraries
2) declare some variables
3) Take input from user for the two no. and which operation has to be done.
4) use switch case for the variable where which operation has to be done is assigned.
5) use cases for +, -, *, /
6) Stop.

c) WAP to take singe digit number from user and print that digit in word by using else-if laddar

```
#include <stdio.h>
#include <conio.h>
main()
{
  int n;
  printf(" enter no. between 0 to 9 :");
  scanf("%d", &n);
  if (n==1)
    {
      printf("one");
    }
  else if (n==2)
    {
      printf("Two");
    }
```

output

enter no. between 0 to 9: 2

Two.

```
else if (n==3)
  {
    printf ("Three");
  }
else if (n==4)
  {
    printf ("four");
  }
else if (n==5)
  {
    printf ("five");
  }
else if (n==6)
  {
    printf ("six");
  }
else if (n==7)
  {
    printf ("seven");
  }
else if (n==8)
  {
    printf ("eight");
  }
else if (n==9)
  {
    printf ("nine"); }
getch();
}
```

Algo:

1) include appropriate ~~libries~~ liabraries
2) declare a variable and assign the value given by user in it.
3) use else-if ladder to check ~~weather~~ which no. it is between 1 to 9.
4) print appropiate word for that particular matched no.
5) stop.

d) Write a program to perform basic arithmetic operations by using else-if ladder.

```
#include <stdio.h>
#include <conio.h>
  void main()
{
  int a, b;
  char op;
  printf("Enter first and second no: \n");
  scanf("%d %d", &a, &b);
  printf("\n Enter operation [+ - * / %]");
  scanf("%s", &op);
  if (op == '+')
    {
      printf("Addition is %d", a+b);
    }
 else if (op == '-')
  {
    printf("subtraction is %d", a-b);
```

output:

Enter 1st and 2nd no: 4 5

Enter operation [+ - * / %]: +

Addition is 9

```
    }
    else if (op=='*')
    {
      printf("multiplication is %d", a*b);
    }
    else if (op=='/')
    {
      printf("Division is %d", a/b);
    }
    else if (op=='%')
    {
      printf("remainder is %d", a%b);
    }
  getch();
}
```

Algo:

1) start
2) Include appropriate libraries
3) declare variable for two operand and one operator
4) assign value of operand taken from user and subsequently do the same for operator (giving menu as [+ - * / %])
5) use else if ladder to check which operator is given as input by user and print appropriate result.
6) stop.

practical-4

Aim: Programs on looping.

1) WAP to print even number between 1 to 15 using while loop

```
#include <stdio.h>
#include <conio.h>
main()
{
   int i;
   printf("All even number from 1 to 15 are: \n");
   i=1;
   while(i<=15)
   {
      if(i%2==0)
      {
         printf("%d \n", i);
      }
      i++;
   }
getch();
}
```

output: All even no. from 1 to 15 are:

2
4
6
8
10
12
14

Algo:

1) ~~start~~
2) include appropriate libraries
3) use while conditional loop to iterate the declared variable till 15.
4) ~~use of~~ if the iterating no is divisible by 2 then print appropriate message
5) increment the iterating ~~value~~ variable by 1
6) Stop.

2) WAP to print odd no between 1 to 15 using do while loop.

```
#include <stdio.h>
#include <conio.h>
   main()
{
   int i, ~~n=15~~;
   printf("odd no. from 1 to 15 are : \n");
   i=1;
    do
   {      if (i%2==1)
          {
             printf ("%d\n",i);
          }
          i++;
   }
   while (i<=15);
   getch();
}
```

3E

Output:

```
odd no. from 1 to 15 are:
1
3
5
7
9
11
13
15
```

algo:
1) include appropriate libraries.
2) use do in that if iterating value which starts from 1 is not divided by 2, print that no.
3) increment that iterating variable.
4) use while till last value which is 15
5) stop.

3) Write a program to print sum of all even number between 1 to n using for loop.

```
#include<stdio.h>
#include<conio.h>
  main()
{
  int n, sum=0;
  printf("enter max limit you want to print");
  scanf("%d", n);
  printf("\n even no
  for(i=1; i<=n; i++)
  {
    if (i%2==0)
     {
       printf("%d", i);
       sum=sum+i;
     }
```

output:

enter max limit you want to print: 10

2
4
6
8
10

Sum of all even no. upto 10 = 30

```
    }
    printf (" In The sum of all even no. upto %d = %d",
                                        n, sum);
    getch();
}
```

Algo:

1) Include appropriate libraries
2) declare variable and assign the max limit
3) Use for to iterate over limit, if it is even add in sum and print at last.
4) print pattern

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

```
#include <stdio.h>
#include <conio.h>
   void main()
   {
      int r,i,j;
      printf(" enter no. of rows");
      scanf("%d", &r);
      printf("\n")
      for (i=1; i<=r; i++)
      {
          for (j=1; j<=i; j++)
          {
```

output:

*

* *

* * *

* * * *

```
        printf(" * ");
    }
    printf("\n");
}
getch();
}
```

Algo:

1) Include appropriate libraries.
2) declare variables
3) ask user for no. of rows to be printed
4) use for loop till range of row
5) use one more for loop inside first one and iterate it till the iterating variable of first loop.
6) print the appropriate pattern's character you want
6) stop.

practical-5

Aim: Programs on arrays.

1) Write a program to find the largest of three numbers in an array.

```
#include <conio.h>
#include <stdio.h>
int main ()
{
   int A , largest;
   int array [3];
   for (A=0, A<3, A++)
   {
      printf ("\n Enter %d elements of the array :\n", A);
      scanf ("%d", &array [A]);
   }
   largest = array [0];
   For (A = 1; A<3 ; A++)
   {
      if (largest < array [A])
       largest = array [A];
   }
   printf ("\n largest element present in the given array is: %d",
            largest);
   return 0;
}
```

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output :

Enter 1' element of the array: 6

Enter 2 element of the array: 2

Enter 3 element of the array: 9

largest element present in the given array is 9

1)

Algo:

1) Include header files
2) declare main function
3) declare variables and array.
4) use conditional loop statement to take elements of array
5) copy first element of array to one variable
6) Check wether the variable's value is larger than further element of array
7) if it is the swap the values or else print the largest number

2) Write a program to count the even or odd numbers present in an array.

```
# include <stdio.h>
# include <conio.h>
  int main()
{
   int i, a[6];
   int even=0, odd=0;
   printf("\n Please enter the array elements\n");
   for(i=0; i<6; i++)
   {
     scanf("%d", a[i]);
   }
```

```
for (i=0 ; i<6 ; i++)
{
  if (a[i] % 2 ==0)
  {
    even ++;
  }
  else
  {
    odd ++;
  }
}
printf ("\n even no in array :%d", even);
printf ("\n odd no in array =%d", odd);
return 0;
}.
```

output:

```
please enter the array's element
4
2
5
6
7
1
even no in array: 3
odd no in array : 3
```

Algo:

1) Include appropriate header files
2) declare main function
3) declare variables and array.
4) ask user to input elements for array and use conditional loop statement to do so.
5) use for conditional loop statement and if statements to check wether the element of array is fully divisible by 2.
6) If it is increase the counter of even no. or else do the same for odd.
7) print the even or odd no.

3) Write a program to ~~take~~ sort the elements of an array

```
# include <stdio.h>
# include <conio.h>
  int main()
{
   int arr[] = {5, 2, 8, 7, 1};
   int temp = 0;
   int length = sizeof(arr)/sizeof(arr[0]);
   printf("Elements of original array: \n");
   for (int i=0; i<length; i++)
   {
      printf("%d ", arr[i]);
   }
```

```
for (int i=0 ; i < length ; i++)
{
   for (int j = i+1 ; j < length ; j++)
   {
      if (arr[i] > arr[j])
       {
          temp = arr[i] ;
          arr[i] = arr[j] ;
          arr[j] = temp ;
       }
   }
}
printf("\n");
printf("element of array sorted in ascending order: \n");
for (int i=0; i < length ; i++)
{
   printf("%d", arr[i]);
}
return 0;
}
```

Algo:

1) Include header files
2) declare main function
3) declare variable and array with it's element
4) print before sorting array.
5) use ~~for loop~~ nesting for loop

output:

elements of original array:

5 2 8 7 1

elements of array sorted in ascending order:

1 2 5 7 8

6) check wether the 1st element is smaller than all element ; do the same for all elements
7) use temporary variable to swap variables.
8) print the sorted array. using for loop.
9) stop.

4) Write a program to perform matrix multiplication.

```
#include <stdio.h>
#include <conio.h>
  int main ()
{
 int m, n, c, d, first [10] [10], second [10] [10], mul [10] [10];
 printf (" enter no. of rows and columns \n");
 scanf ("%d %d", &m, &n);
 printf (" Enter element of first matrix \n");
  for (c = 0; c < m; c++)
  {
     For ( d = 0; d < n; d++)
     {
       scanf ("%d", & first [c] [d]);
     }
  }
 printf (" enter element of second matrix \n");
```

```
For (c=0; c<m; c++)
 {
   for (d=0; d<n; d++)
    {
     scanf("%d", &second[c][d]);
    }
 }
printf("multiplication of entered matrix:-\n");
For (c=0; c<m; c++)
 {
   for (d=0; d<n; d++)
    {
      mul[c][d] = First[c][d] * second[c][d];
      printf("%d\t", sum[c][d]);
    }
   printf("\n");
 }
   return 0;
}
```

Algo:

1) Include header file
2) declare main function
3) declare variables and arrays for 1st and 2nd matrix also for multiplyed matrix.
4) ask user for ~~First elements~~ no. of rows and columns
5) assign the value's to the first array given by user as elements

output:

Enter no. of rows and colr: 2 2

Enter element of first matrix: 1 2 3 4

Enter element of second matrix: 4 2 3 1

multiplication of entered matrix:-

4 4

9 4

6) assign the value's given by user to second array as element
7) use for conditional loop to multiply the first and second matrix and store it to multiply matrix
8) print the multiplied matrix
9) stop.

Practical-6

Aim: Programs on Function.

1) Function with no arguments and no return values

```
#include <stdio.h>
#include <conio.h>
   int main ()
  {
     void print();
     print ();
     printf();
     return 0;
  }
   void print()
   {
     for (int i=1 ; i<20 ; i++)
    printf ("*");
     printf ("\n");
   }
```

Algo:

1) Include header files
2) declare main function
3) declare a user-defined function with no argument
4) call the function
5) return 0

1) use ~~for loop~~ user-defined function
2) use for loop to print *

Output :

2) Sum of digits of entered number

```
#include <stdio.h>
#include <conio.h>
   int digi (int x);
   int main()
{
   int a;
   printf ("Enter the no.");
   scanf ("%d", &a);
    printf ("%d", digi (a));
    return 0;
}
   int digi (int x)
   {
     int temp, sum=0;
     temp = x;
     while (x>0)
      sum = sum + temp;
      x = x/10;
    }
     printf ("sum of the digits:");
    return sum;
}
```

8A

Output:

Enter the no: 1523

Sum of the digits : 11

Algo:

1) include header files
2) declare a user-defined function with one argument
3) declare main function
4) declare variable
5) ask for no., and assign it to variable
6) print the called function. (user-defined) and pass the ~~argu~~ assigned variable as a argument
1) In user defined function, declare appropriate variable
2) Use while loop to extract the last digit of no. and sum it to one of the variable
3) return that variable

3) Factorial of a number using recursion.

```
#include <stdio.h>
#include <conio.h>
   long int multiplynumber (int n);
  int main ()
   {
     int n;
     printf("Enter a positive integer: ");
     scanf("%d", &n);
     printf("Factorial of %d = %ld", n, multiplyNumber(n));
     return 0;
   }
  long int multiplynumber (int n)
   {
```

```
    if (n>=1)
    {return n * multiplynumbers (n-1);}
    else
    {
      return 1;
    }
}
```

Algo:

1) include header files
2) declare user-defined function with an argument.
3) declare main function
4) declare variables
5) Ask user for a any no. and assign it to one of the variable.
6) Print "factorial is" while calling the user-defined function and passed the assigned variable as an argument
7) In user-defined function; use if-else conditional statement to check if whether passed argument is greater than or equal to 1
8) If yes return the passed argument multiplied by the once again called function with passed argument decrement by 1.
9) else return 1.

4) Write a program to which shows gets() function uses.

```
#include <stdio.h>
#include <conio.h>
int main()
{
    char buf[15];
    printf("Enter a string:");
    gets(buf);
    printf("string is: %s\n", buf);
    return 0;
}
```

Algo:

1) Include header files
2) declare main function
3) declare variables to be used or arrays
4) use gets function and passes the array as their arguments
5) and ask user for to enter element of array.
6) print the array
7) Stop.