BHARTIYA INSTITUTE OF ENGINEERING & TECHNOLOGY, SIKAR

LAB MANUAL

(PART 1)

FIRST YEAR

(II SEMESTER)

Subject Code: 2FY3-24

COMPUTER PROGRAMMING LAB

श्रेष्ठतमाय कर्मणे

Prepared By:
Mr. AMIT SINGH SHEKHAWAT
Head of Department
(CSE Dept.)

Prepared By:
Mr. PANKAJ GOTHWAL
Assistant Professor
(CSE Dept.)

Department of Computer Science & Engineering

BIET, Sikar

Website: www.bietsikar.ac.in

LIST OF EXPERIMENTS

1.Eight programs using input output statements, if statement, for loops, while loops, do-while loops, switch statement, break statement, continue statement, data type conversion etc.

2. Check a number-palindrome, prime, etc.

3. Eight programs using functions.

4. Two programs using recursion and Iteration.

EXPERIMENT: 1

Aim: WAP to calculate sum and average of two numbers

Code:

```c
/* c program find sum and average of two numbers*/
#include <stdio.h>

int main()
{
    int a,b,sum;
    float avg;

    printf("Enter first number :");
    scanf("%d",&a);
    printf("Enter second number :");
    scanf("%d",&b);

    sum=a+b;
    avg= (float)(a+b)/2;

    printf("\nSum of %d and %d is = %d",a,b,sum);
    printf("\nAverage of %d and %d is = %f",a,b,avg);

    return 0;
}
```

Output:

```
Enter first number :10
Enter second number :15

Sum of 10 and 15 is = 25
Average of 10 and 15 is = 12.500000
```

EXPERIMENT: 2

Aim: WAP to calculate simple interest.

Code:

```c
#include<stdio.h>

int main() {
    int amount, rate, time, si;

    printf("\nEnter Principal Amount : ");
    scanf("%d", &amount);

    printf("\nEnter Rate of Interest : ");
    scanf("%d", &rate);

    printf("\nEnter Period of Time   : ");
    scanf("%d", &time);

    si = (amount * rate * time) / 100;
    printf("\nSimple Interest : %d", si);

    return(0);
}
```

Output:

```
Enter Principal Amount : 500
Enter Rate of interest : 5
Enter Period of Time   : 2
Simple Interest : 50
```

EXPERIMENT: 3(A)

Aim: WAP to calculate area and circumference of a circle.

Code:

```c
#include<stdio.h>

int main() {

    int rad;
    float PI = 3.14, area, ci;

    printf("\nEnter radius of circle: ");
    scanf("%d", &rad);

    area = PI * rad * rad;
    printf("\nArea of circle : %f ", area);

    ci = 2 * PI * rad;
    printf("\nCircumference : %f ", ci);

    return (0);
}
```

Output:

```
Enter radius of a circle : 1
Area of circle : 3.14
Circumference  : 6.28
```

EXPERIMENT: 3(B)

Aim: WAP to calculate area and circumference of a circle.

Code:

```c
/* C Program to find Area of a Triangle and Perimeter of a Triangle */

#include<stdio.h>
#include<math.h>

int main()
{
  float a, b, c, Perimeter, s, Area;

  printf("\nPlease Enter three sides of triangle\n");
  scanf("%f%f%f",&a,&b,&c);

  Perimeter = a+b+c;
  s = (a+b+c)/2;
  Area = sqrt(s*(s-a)*(s-b)*(s-c));

  printf("\n Perimeter of Traiangle = %.2f\n", Perimeter);
  printf("\n Semi Perimeter of Traiangle = %.2f\n",s);
  printf("\n Area of triangle = %.2f\n",Area);

  return 0;
}
```

Output:

```
Please Enter three sides of triangle
5
6
7
Perimeter of Traiangle = 18.00

Semi Perimeter of Traiangle = 9.00

Area of triangle = 14.70
```

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

EXPERIMENT: 4(A)

Aim: WAP to demonstrate if statement in C programming language.

Code:

```c
// Program to display a number if user enters negative number
// If user enters positive number, that number won't be displayed

#include <stdio.h>
int main()
{
    int number;

    printf("Enter an integer: ");
    scanf("%d", &number);

    // Test expression is true if number is less than 0
    if (number < 0)
    {
        printf("You entered %d.\n", number);
    }

    printf("The if statement is easy.");

    return 0;
}
```

Output:

```
Enter an integer: -2
You entered -2.
The if statement is easy.
```

EXPERIMENT: 4(B)

Aim: WAP to demonstrate if…else statement in C programming language.

Code:

```c
// Program to check whether an integer entered by the user is odd or even

#include <stdio.h>
int main()
{
    int number;
    printf("Enter an integer: ");
    scanf("%d",&number);

    // True if remainder is 0
    if( number%2 == 0 )
        printf("%d is an even integer.",number);
    else
        printf("%d is an odd integer.",number);
    return 0;
}
```

Output:

```
Enter an integer: 7
7 is an odd integer.
```

EXPERIMENT: 4(C)

Aim: WAP to demonstrate nested if…else statement in C programming language.

Code:

```c
// Program to relate two integers using =, > or <

#include <stdio.h>
int main()
{
    int number1, number2;
    printf("Enter two integers: ");
    scanf("%d %d", &number1, &number2);

    //checks if two integers are equal.
    if(number1 == number2)
    {
        printf("Result: %d = %d",number1,number2);
    }

    //checks if number1 is greater than number2.
    else if (number1 > number2)
    {
        printf("Result: %d > %d", number1, number2);
    }

    // if both test expression is false
    else
    {
        printf("Result: %d < %d",number1, number2);
    }

    return 0;
}
```

Output:

```
Enter two integers: 12
23
Result: 12 < 23
```

EXPERIMENT: 5

Aim: WAP to solve second order quadratic equation.

Code:

```c
#include<stdio.h>
#include<math.h>

int main() {
    float a, b, c;
    float desc, root1, root2;

    printf("\nEnter the Values of a : ");
    scanf("%f", &a);
    printf("\nEnter the Values of b : ");
    scanf("%f", &b);
    printf("\nEnter the Values of c : ");
    scanf("%f", &c);

    desc = sqrt(b * b - 4 * a * c);

    root1 = (-b + desc) / (2.0 * a);
    root2 = (-b - desc) / (2.0 * a);

    printf("\nFirst Root : %f", root1);
    printf("\nSecond Root : %f", root2);

    return (0);
}
```

Output:

```
Enter the Values of a : 1
Enter the Values of a : -5

Enter the Values of a : 6

First Root : 3.000000
Second Root : 2.000000
```

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

EXPERIMENT: 6

Aim: WAP to convert the temperature from Celsius to Fahrenheit.

Code:

```c
#include<stdio.h>

int main() {
 float celsius, fahrenheit;

 printf("\nEnter temp in Celsius : ");
 scanf("%f", &celsius);

 fahrenheit = (1.8 * celsius) + 32;
 printf("\nTemperature in Fahrenheit : %f ", fahrenheit);

 return (0);
}
```

Output:

```
Enter temp in Celsius : 32
Temperature in Fahrenheit : 89.59998
```

EXPERIMENT: 7

Aim: WAP to calculate the factorial of a given number.

Code:

```c
#include <stdio.h>
int main()
{
    int n, i;
    unsigned long long factorial = 1;

    printf("Enter an integer: ");
    scanf("%d",&n);

    // show error if the user enters a negative integer
    if (n < 0)
        printf("Error! Factorial of a negative number doesn't exist.");

    else
    {
        for(i=1; i<=n; ++i)
        {
            factorial *= i;                    // factorial = factorial*i;
        }
        printf("Factorial of %d = %llu", n, factorial);
    }

    return 0;
}
```

Output:

```
Enter an integer: 10
Factorial of 10 = 3628800
```

EXPERIMENT: 8

Aim: WAP to check whether a number prime or not.

Code:

```c
#include <stdio.h>
int main()
{
    int n, i, flag = 0;

    printf("Enter a positive integer: ");
    scanf("%d",&n);

    for(i=2; i<=n/2; ++i)
    {
        // condition for nonprime number
        if(n%i==0)
        {
            flag=1;
            break;
        }
    }

    if (flag==0)
        printf("%d is a prime number.",n);
    else
        printf("%d is not a prime number.",n);

    return 0;
}
```

Output:

```
Enter a positive integer: 29
29 is a prime number.
```

EXPERIMENT: 9

Aim: WAP to check whether a number palindrome or not.

Code:

```c
#include <stdio.h>
int main()
{
    int n, reversedInteger = 0, remainder, originalInteger;

    printf("Enter an integer: ");
    scanf("%d", &n);

    originalInteger = n;

    // reversed integer is stored in variable
    while( n!=0 )
    {
        remainder = n%10;
        reversedInteger = reversedInteger*10 + remainder;
        n /= 10;
    }

    // palindrome if orignalInteger and reversedInteger are equal
    if (originalInteger == reversedInteger)
        printf("%d is a palindrome.", originalInteger);
    else
        printf("%d is not a palindrome.", originalInteger);

    return 0;
}
```

Output:

```
Enter an integer: 1001
1001 is a palindrome.
```

EXPERIMENT: 10

Aim: WAP to print the Fibonacci series.

Code:

```c
#include <stdio.h>
int main()
{
    int i, n, t1 = 0, t2 = 1, nextTerm;

    printf("Enter the number of terms: ");
    scanf("%d", &n);

    printf("Fibonacci Series: ");

    for (i = 1; i <= n; ++i)
    {
        printf("%d, ", t1);
        nextTerm = t1 + t2;
        t1 = t2;
        t2 = nextTerm;
    }
    return 0;
}
```

Output:

```
Enter the number of terms: 10
Fibonacci Series: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34,
```

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

EXPERIMENT: 11

Aim: WAP to check whether a number is perfect number or not.

Code:

```c
/**
 * C program to check whether a number is Perfect number or not
 */

#include <stdio.h>

int main()
{
    int i, num, sum = 0;

    /* Input a number from user */
    printf("Enter any number to check perfect number: ");
    scanf("%d", &num);

    /* Calculate sum of all proper divisors */
    for(i=1; i<num; i++)
    {
        /* If i is a divisor of num */
        if(num%i == 0)
        {
            sum += i;
        }
    }

    /* Check whether the sum of proper divisors is equal to num */
    if(sum == num)
    {
        printf("%d is PERFECT NUMBER", num);
    }
    else
    {
        printf("%d is NOT PERFECT NUMBER", num);
    }

    return 0;
}
```

Output:

```
Enter any number to check perfect number: 6
6 is PERFECT NUMBER
```

EXPERIMENT: 12

Aim: WAP to check whether a given number is Armstrong or not.

Code:

```c
#include <stdio.h>
#include <math.h>

int main()
{
    int number, originalNumber, remainder, result = 0, n = 0 ;

    printf("Enter an integer: ");
    scanf("%d", &number);

     originalNumber = number;

    while (originalNumber != 0)
    {
        originalNumber /= 10;
        ++n;
    }

    originalNumber = number;

    while (originalNumber != 0)
    {
        remainder = originalNumber%10;
        result += pow(remainder, n);
        originalNumber /= 10;
    }

    if(result == number)
        printf("%d is an Armstrong number.", number);
    else
        printf("%d is not an Armstrong number.", number);

    return 0;
}
```

Output:

```
Enter an integer: 1634
1634 is an Armstrong number.
```

EXPERIMENT: 13

Aim: WAP to print the reverse of a given number.

Code:

```c
#include<stdio.h>

int main() {
    int num, rem, rev = 0;

    printf("\nEnter any no to be reversed : ");
    scanf("%d", &num);

    while (num >= 1) {
        rem = num % 10;
        rev = rev * 10 + rem;
        num = num / 10;
    }

    printf("\nReversed Number : %d", rev);
    return (0);
}
```

Output:

```
Enter any no to be reversed : 123
Reversed Number : 321
```

EXPERIMENT: 14

Aim: WAP to calculate the sum of natural numbers using recursion.

Code:

```c
#include <stdio.h>
int sum(int n);

int main()
{
    int number, result;

    printf("Enter a positive integer: ");
    scanf("%d", &number);

    result = sum(number);

    printf("sum=%d", result);
}

int sum(int num)
{
    if (num!=0)
        return num + sum(num-1); // sum() function calls itself
    else
        return num;
}
```

Output:

```
Enter a positive integer:
3
6
```

EXPERIMENT: 15

Aim: WAP to demonstrate the switch case statement.

Code:

```c
#include <stdio.h>

int main()
{
    int week;

    /* Input week number from user */
    printf("Enter week number(1-7): ");
    scanf("%d", &week);

    switch(week)
    {
        case 1:
            printf("Monday");
            break;
        case 2:
            printf("Tuesday");
            break;
        case 3:
            printf("Wednesday");
            break;
        case 4:
            printf("Thursday");
            break;
        case 5:
            printf("Friday");
            break;
        case 6:
            printf("Saturday");
            break;
        case 7:
            printf("Sunday");
            break;
        default:
            printf("Invalid input! Please enter week number between 1-7.");
    }

    return 0;
}
```

Output:

```
Enter week number(1-7): 1
Monday
```

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

EXPERIMENT: 16(A)

Aim: WAP to print half pyramid using *.

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

Code:

```c
#include <stdio.h>
int main()
{
    int i, j, rows;

    printf("Enter number of rows: ");
    scanf("%d",&rows);

    for(i=1; i<=rows; ++i)
    {
        for(j=1; j<=i; ++j)
        {
            printf("* ");
        }
        printf("\n");
    }
    return 0;
}
```

EXPERIMENT: 16(B)

Aim: WAP to print half pyramid using number.

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

Code:

```c
#include <stdio.h>
int main()
{
    int i, j, rows;

    printf("Enter number of rows: ");
    scanf("%d",&rows);

    for(i=1; i<=rows; ++i)
    {
        for(j=1; j<=i; ++j)
        {
            printf("%d ",j);
        }
        printf("\n");
    }
    return 0;
}
```

EXPERIMENT: 16(C)

Aim: WAP to print half pyramid using alphabets.

```
A
B B
C C C
D D D D
E E E E E
```

Code:

```c
#include <stdio.h>
int main()
{
    int i, j;
    char input, alphabet = 'A';

    printf("Enter the uppercase character you want to print in last row: ");
    scanf("%c",&input);

    for(i=1; i <= (input-'A'+1); ++i)
    {
        for(j=1;j<=i;++j)
        {
            printf("%c", alphabet);
        }
        ++alphabet;

        printf("\n");
    }
    return 0;
}
```