PRACTICAL 3-5

M.K.E.A.D.JAYASINGHE

INDEX NO : 30362

23.1 BATCH

SOFTWARE ENGINEERING (PLYMOUTH)

Practical No 03

1. Input two numbers and display the highest number

```
{
   int num1,num2,max;
   printf("Enter two numbers : ");
   scanf("%d %d",&num1,&num2);
   if(num1>num2)
      max=num1;
   else
      max=num2;
   printf("The highest number is %d",max);
}
```

2. Enter three integer numbers, and then tell the user the largest value and smallest value among the three numbers

```
{
   int num1,num2,num3,min,max;
   printf("Enter 03 numbers : ");
   scanf("%d %d %d",&num1,&num2,&num3);
   max=num1;
   if(num2>max)
      max=num2;
   if(num3>max)
      max=num3;
   printf("The highest number is %d\n",max);
   min=num1;
   if(num2<min)
      min=num2;
   if(num3<min)
      min=num3;
   printf("The smallest number is %d",min);
}
```

3. Display employee name, new salary, when the user inputs employee name, and basic salary.

```
{
   char name[20];
   float ns,bs,inc;
   printf("Enter employee name : ");
   scanf("%s",&name);
   printf("Enter the basic salary : ");
   scanf("%f",&bs);
   if(bs>=10000)
      inc=bs*0.15;
   else if(bs>=5000)
      inc=bs*0,10;
   else
      inc=bs*0.05;
   ns=bs+inc;
   printf("Employee name is %s",name);
   printf("\n New salary is %.2f",ns);
}
```

4. Write a program that reads in the radius of a circle and prints the circle's diameter, circumference and area. Use the constant value 3.14159 for π.

```
{
   float dia,cir,area,rad,pi;
   printf("Enter the radius : ");
   scanf("%f",&rad);
   pi=3.14159;
   dia=rad*2;
   printf("\nDiameter is %.2f",dia);
   cir=(2*pi*rad);
   printf("\nCircumference is %.2f",cir);
   area=(pi*rad*rad);
   printf("\nArea is %.2f\n",area);
}
```

5. Write a program that reads in two integers and determines and prints if the first is a multiple of the second.

```
{
   int num1,num2;
   printf("Enter 02 integers : ");
   scanf("%d %d",&num1,&num2);
   if(num1%num2==0)
      printf("\n%d is a multiple of %d\n",num1,num2);
   else
      printf("\n%d is not a multiple of %d\n",num1,num2);

}
```

6. Write a C program that prints the integer equivalents of A B C a b c 0 1 2 $ * + / and the blank character.

```
{
   printf("Uppercase letters:\n");
   printf("A: %d\nB: %d\nC: %d\n", 'A', 'B', 'C');
   printf("\nLowercase letters:\n");
   printf("a: %d\nb: %d\n% c: d\n ", 'a', 'b', 'c');
   printf("\nDigits:\n");
   printf("0: %d\n1: %d\n2: %d\n ", '0', '1', '2');
   printf("\nSpecial symbols:\n");
   printf("$: %d\n*: %d\n+: %d\n/: %d\n ", '$', '*', '+', '/');
   printf("\nBlank character:\n");
   printf("Blank: %d\n", ' ');
}
```

Practical No 04

1. Use If-Else and write a program that reads an integer and determines and prints if the number is even or odd.

```
{
   int num;
   printf("Enter a number : ");
   scanf("%d",&num);
   if(num%2==0)
      printf ("%d is an even number",num);
   else
      printf("%d is an odd number",num);
}
```

Re-write the above program using a switch statement instead of an If-Else statement!

```
{
   int num,r;
   printf("Enter a number : ");
   scanf("%d",&num);
   r=num%2;
   switch(r)
   {
      case 0:printf("%d is even",num);break;
      case 1:printf("%d is odd",num);break;
   }
}
```

2. Write a simple menu driven calculator to perform (+ - / *) operations.

```
{float n1,n2;
 int op;
 printf("Enter 02 numbers : ");
 scanf("%f %f",&n1,&n2);
 printf("1. +\n2. -\n3. *\n4. /\n");
 printf("Please enter your choice : ");
 scanf("%d",&op);
 switch(op)
 {
 case 1:printf("Addition is %.2f",n1+n2);break;
 case 2:printf("Subtraction is %.2f",n1-n2);break;
 case 3:printf("Multiplication is %.2f",n1*n2);break;
 case 4:printf("Division is %.2f",n1/n2);break;
 }}
```

3. Create a text-based, menu-driven program that allows the user to choose whether to calculate the circumference of a circle, the area of a circle or the volume of a sphere.

```
{
   float r,cir,area,volume,pi=3.14;
   int choice;
   printf("1.Circumference\n");
   printf("2.Area\n");
   printf("3.Volume\n");
   printf("What is your choice\n");
   scanf("%d",&choice);
   switch(choice)
   {
      case 1:printf("Enter the radius : ");
            scanf("%f",&r);
            cir=2.00*pi*r;
            printf("Circumference is %f",cir);
      case 2:printf("Enter the radius : ");
            scanf("%f",&r);
            area=pi*r*r;
            printf("Area is %f",area);
      case 3:printf("Enter the radius : ");
            scanf("%f",&r);
            volume=(4/3*pi*r*r*r);
            printf("Volume is %f",volume);

   }
}
```

4. Write a C program to read a character from the user and determine whether the given letter is vowel or not.

```
{
   char v;
   printf("Enter a character : ");
   scanf("%c",&v);
   switch(v)
   {
      case 'a':printf("a is a vowel");break;
      case 'e':printf("e is a vowel");break;
      case 'i':printf("i is a vowel");break;
      case 'o':printf("o is a vowel");break;
      case 'u':printf("u is a vowel");break;
      default:printf("%c is not a vowel",v);
   }
}
```

5. Write a C program to enter month number and print total number of days in month using switch case.

```
{
   int m;
   printf("Enter the month number: ");
   scanf("%d", &m);
   switch(m)
   {
      case 1:printf("January has 31 days.\n");break;
      case 2:printf("February has 28 days.\n");break;
      case 3:printf("March has 31 days.\n");break;
      case 4:printf("April has 30 days.\n");break;
      case 5:printf("May has 31 days.\n");break;
      case 6:printf("June has 30 days.\n");break;
      case 7:printf("July has 31 days.\n");break;
      case 8:printf("August has 31 days.\n");break;
      case 9:printf("September has 30 days.\n");break;
      case 10:printf("October has 31 days.\n");break;
      case 11:printf("November has 30 days.\n");break;
      case 12:printf("December has 31 days.\n");break;
      default:printf("Invalid month number entered!\n");
   }
}
```

Practical No 05

1. Write a C program to print numbers from 0 to 100. (You are required to write 3 separate answers each using While, Do While, For, looping structures).

While

```
{
   int x=1;
   while(x<=100)
   {
      printf("%d ",x);
      x+=1;
   }
}
```

Do While

```
{
   int x=1;
   do
   {
      printf("%d ",x);
      x+=1;
   }while(x<=100);
}
```

For

```
{
   int x;
   for(x=1;x<=100;x++)
   {
      printf("%d ",x);
   }
}
```

2. Write a C program to calculate and print the total of 10 marks and the average. If the average is less than 50 program should print “Fail!” otherwise “Pass!”

```
{
   int mark,c,sum=0,avg;
   for(c=1;c<=10;c++)
   {
   printf("Enter marks for subject %d : ",c);
   scanf("%d",&mark);
   sum+=mark;
   }
   avg=sum/10;
   printf("Total marks is %d\nAverage is %d\n",sum,avg);
   if(avg<50)
      printf("Fail");
   else
      printf("Pass");
}
```

3. Write a C program to calculate factorial of a user given number.

```
{
   int i,num,f=1;
   printf("Enter a number : ");
   scanf("%d",&num);
   if(num<=0)
      printf("Error");
   else
   {
      for(i=1;i<=num;i++)
         f*=i;
   }
   printf("%d",f);
}
```

4. Write a C program to calculate the sum of all digits of a user given number.

```
{
   int num,sum=0,r;
   printf("Enter a number : ");
   scanf("%d",&num);
   while(num>0)
   {
      r=num%10;
      num/=10;
      sum+=r;
   }

   printf("Sum is %d",sum);

}
```

5. Write a C program to reverse the digits of a number using do-while statement.

```
{
   int num,sum=0,r;
   printf("Enter a number : ");
   scanf("%d",&num);
   do
   {
      r=num%10;
      sum=sum*10+r;
      num/=10;
   }
   while(num>0);
   printf("The reverse value is %d",sum);
}
```

6. Write a C program to calculate nth power of a given integer. The user inputs base and exponent.

```
{
   int base,exp,r=1;
   printf("Enter the base : ");
   scanf("%d",&base);
   printf("Enter the exponent : ");
   scanf("%d",&exp);
   for(int i=0;i<exp;i++)
      {r*=base;}
   printf("The power is %d ",r);
}
```

7. Write a C program to print first 10 numbers of “Fibonacci Sequence”.

```
{
int n1=0,n2=1,next;
   int i;
   printf("Fibonacci sequence : %d %d ",n1,n2);
   for(i=3;i<=10;i++)
   {
      next=n1+n2;
      printf("%d ",next);
      n1=n2;
      n2=next;
   }
   printf("\n");

}
```

8. Write a C program to check whether a given number is an Armstrong Number!

```
{
   int num, originalNumber, rem, result = 0;
   printf("Enter a number: ");
   scanf("%d", &num);
   originalNumber = num;
   while (num!= 0)
   {
      rem = num % 10;
      result += rem * rem * rem;
      num/= 10;
   }
   if (result == originalNumber)
      printf("%d is an Armstrong number.\n", originalNumber);
   else
      printf("%d is not an Armstrong number.\n", originalNumber);
}
```

9. Write a C program to print all the ASCII values for letters A to Z.

```
{
   int letter;
   for (letter = 65; letter <= 90; letter++)
   {
   printf("Character: %c\t ASCII Value: %d\n", letter, letter);
   }
}
```

10. Write a program to print this pattern.

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

```
{
   int a,b;
   for(a=1;a<=5;a++)
   {
      for(b=1;b<=a;b++)
         {
            printf("* ");
         }
   printf("\n");
   }
}
```

11. Write a program to check whether a given number is prime or not

```
{
   int number, i;
   printf("Enter a number: ");
   scanf("%d", &number);
   for (i=2;i<=number/2;i++)
      {
      if (number%i==0)
         printf("%d is not a prime number.\n", number);
      else
         printf("%d is a prime number.\n", number);
      }
}
```

12. Write a C program to print all factors of a given integer.

```
{
   int num;
   printf("Enter a number: ");
   scanf("%d", &num);
   printf("Factors of %d are: ", num);
   for (int i = 1; i <= num; i++) {
      if (num % i == 0) {
         printf("%d ", i);
      }
   }
   printf("\n");
}
```

12. Write a C program to add all user inputs until user input '-1'. And then display the sum.

```
{
   int n, sum = 0;
   printf("Enter numbers:\n");
   while (n!=-1)
      {
      scanf("%d", &n);
      sum += n;
      }
   printf("Sum is %d\n", sum);
}
```

Section B

1.
```
{
   int n,odd=0,even=0,c=1;
   do
   {
      printf("Enter number %d : ",c);
      scanf("%d",&n);
      if(n%2==0)
         even+=1;
      else
         odd+=1;
         c++;
   }
   while(c<=10);
   printf("\nThere are %d even numbers\n",even);
   printf("There are %d odd numbers\n",odd);
}
```

2.
```
{
   int marks[10],i,sum=0,max,min,avg;
   printf("Enter the marks of 10 students:\n");
   for (i = 0; i < 10; i++) {
      printf("Enter marks for student %d: ", i + 1);
      scanf("%d", &marks[i]);
      sum += marks[i];
      if (i == 0) {
         max= marks[i];
         min= marks[i];
      } else {
         if (marks[i] > max)
            max= marks[i];
         if (marks[i] < min)
            min= marks[i];
      }
   }
   avg=sum/10;
   printf("Maximum Mark: %d\n", max);
   printf("Minimum Mark: %d\n", min);
   printf("Average Mark: %d\n", avg);
}
```

3.
```
{
   float p[10];
   int i, c = 0;
   float sum = 0.0;
   printf("Enter the p of 10 items:\n");
   for (i = 0; i < 10; i++) {
      scanf("%f", &p[i]);
      sum += p[i];
      if (p[i] > 200.0)
         c++;}
   float average = sum / 10;
   printf("Average price of an item: %.2f\n", average);
   printf("Number of items with price greater than 200: %d\n", c);
}
```

4.
```
{
   int employeeNo, c = 0;
   float bs;
   printf("Enter Employee No and Basic Salary: \n");
   while (1) {
      scanf("%d", &employeeNo);
      if (employeeNo == -999)
         break;
      scanf("%f", &bs);
      if (bs >= 5000)
         c++;}
      printf("Number of Employees with Basic Salary >= 5000: %d\n", c);
   return 0;
}
```

5.
```
{
   int empNo;
   float hours;
   int count = 0;
   int total = 0;
   int over4000 = 0;
   printf("Enter Employee Number and Hours Worked :\n");
   while (1) {
      scanf("%d", &empNo);
      if (empNo == -999)
         break;
      scanf("%f", &hours);
      float overtime = (hours > 40) ? (hours - 40) * 200 + 40 * 150 : hours * 150;
      printf("Employee Number: %d\n", empNo);
      printf("Overtime Payment: %.2f\n", overtime);
      total++;
      over4000 += (overtime > 4000);}
   float percentage = (total > 0) ? (float) over4000 / total * 100 : 0;
```

```
    printf("Percentage of Employees with Overtime Payment exceeding Rs. 4000: %.2f%%\n", percentage);
}
```