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Practical 3 to 5

23.1

Computing in C

Index no 29630

Practical Number 3

1.Write a program to input two numbers and display the highest number

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
   int n1,n2,max;
```

```
    printf("Enter two numbers ");
    scanf("%d %d",&n1,&n2);

    if(n1>n2)
    max=n1;
    else
    max=n2;
    printf("The highest is %d \n",max);

    return 0;
}
```

2.Write a complete program to ask user enter three integer numbers, and then tell the user the largest value and smallest value among the three numbers.

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int n1,n2,n3,max,smalle;
    printf("Enter three numbers ");
    scanf("%d %d %d" ,&n1,&n2,&n3);
    max=n1;
```

```
    smalle=n1;
    if(n2>max)
    max=n2;
    if(n3>max)
    max=n3;
    if(n2<smalle)
    smalle=n2;
    if(n3<smalle)
    smalle=n3;
    printf("The largest is %d \n",max);
    printf("The smallest is %d \n",smalle);

    return 0;
}
```

3.Display employee name, new salary, when the user inputs employee name, and basic salary. You can refer following formula and the table to calculate new salary:

New Salary = Basic Salary + Increment

Basic Salary	Increment
Less than 5000	5% of Basic Salary
More than or equal 5000	

and less than 10000 10% of Basic Salary

More than or equal 10,000 15% of Basic Salary

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
   char empname[20];
   float bs,inc,ns;
   printf("Enter employee name ");
   scanf("%s",&empname);
   printf("Enter basic salary ");
   scanf("%f",&bs);
   if(bs<=5000)
   inc=0.05*bs;
   else if (5000<=bs<10000)
   inc=0.1*bs;
   else {
   inc=0.15*bs;
 }
  ns=bs+inc;
```

```
  printf("Employee name %s \n",empname);
  printf("New salary %.2f \n",ns);
  return 0;
}
```

4.Diameter, Circumference and Area of a Circle) 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. Perform each of these calculations inside the printf statement(s) and use the conversion specifier %f

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
   double r,d,c,a;
   double PI=M_PI;
   printf("Enter the radius of a circle ");
   scanf("%lf",&r);
   d=2*r;
   c=2*PI*r;
   a=PI*r*r;
   printf("diameter: %.2f \n",d);
```

```
    printf("circumference: %.2f \n",c);
    printf("area: %.2f \n",a);

    return 0;
}
```

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

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int num1,num2;
    printf("Enter two numbers ");
    scanf("%d %d",&num1,&num2);
    if(num1!=0 && num1%num2==0)
    printf("%d is a multiple of %d \n",num1,num2);
    else
    printf("%d is not a multiple of %d \n",num1,num2);
```

```
    return 0;
}
```

6.Write a C program that prints the integer equivalents of some uppercase letters, lowercase letters, digits and special symbols. As a minimum, determine the integer equivalents of the following: A B C a b c 0 1 2 $ * + / and the blank character

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

int main()
{
    printf("%d\n",'A');
    printf("%d\n",'B');
    printf("%d\n",'C');
    printf("%d\n",'a');
    printf("%d\n",'b');
    printf("%d\n",'c');
    printf("%d\n",'0');
    printf("%d\n",'1');
```

```
    printf("%d\n",'2');
    printf("%d\n",'$');
    printf("%d\n",'*');
    printf("%d\n",'+');
    printf("%d\n",'/');

    return 0;
}
```

7.The gross remuneration of a company salesman comprises the Basic Salary and certain additional allowances and bonuses as given below:

Salesmen with over 5 years' service receive a 10% additional allowance of Basic Salary each month.

Salesmen working in Colombo (Input character 'C' if the city is Colombo) receive an additional allowance of Rs. 2,500/- per month.

The monthly bonus payment is computed as given below:

Monthly Sales(Rs)	Bonus as a percentage

	of monthly sales
0-25000 25000-50000 >=50000	10 12 15

Write a program to output the gross monthly remuneration of a salesman

```
char name[20],city;
float b_salary,service_years,m_sales,a_allowance,bonus,g_remuneration ;
printf("Enter the sales persons name: ");
scanf("%s",&name);
printf("Enter the basic salary: ");
scanf("%f",&b_salary);
printf("service years: ");
scanf("%f",&service_years);
printf("Enter the city: ");
scanf("%s",&city);
printf("Enter the monthly sales: ");
scanf("%f",&m_sales);
```

```
if(m_sales>=50000)
{
 bonus = 0.15* m_sales;
}
else if (m_sales<=25000)
{
 bonus = 0.1* m_sales;
}
else
{
 bonus = 0.12* m_sales;
}
switch(city)
{
   case'c':a_allowance = 2500;break;
   default:a_allowance = 0;
}
service_years=5;
if(service_years>5)
{
  a_allowance = 0.1*b_salary;
}
g_remuneration = b_salary + a_allowance + bonus;
printf("gross remuneration : %.2f" ,g_remuneration);
```

Practical Number 4

1. Use If-Else and write a program that reads an integer and determines and prints if the number is even or odd. (i.e. divisible by 2)

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
  int n1;
  printf("Enter a number : ");
  scanf("%d",&n1);
  if (n1%2==0)
  printf ("%d is an even number", n1);
  else
 {
   printf ("%d is an odd number", n1);
 }
```

//switch//

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

```
 int no;
 printf ("Enter a number :");
 scanf ("%d",&no);
 switch (no%2)
 {
 case 0: printf ("%d is an even number", no); break;
 case 1: printf ("%d is an odd number", no); break;
 default: printf("%d is an invalid input",no);
 }

 return 0;
}
```

2. Write a simple menu driven calculator to perform (+ - / *) operations. (The program must display a menu to select the desired operator

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
 int n1, n2, opt, add, sub, mul;
 float div;
 printf ("Enter two numbers : ");
 scanf ("%d %d",&n1,&n2) ;
```

```
 printf (" 1-addition\n 2-subtraction\n 3-multiplication\n 4-division\n ");
 printf ("select the operator :");
 scanf("%d",&opt);
 switch (opt)
 {
 case 1:printf ("Addition is %d",add,add=n1+n2);break;
 case 2:printf ("Subtraction IS %d",sub,sub=n1-n2) ;break;
 case 3:printf ("Multiplication is %d",mul,mul=n1*n2) ;break;
 case 4:printf ("Division is %.2f",div=n1/n2) ; break;
 default:printf ("Invalid operator.");
 }
 return 0;
}
```

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. The program should then input a radius from the user, perform the appropriate calculation and display the result

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
 int r;
 char ch;
```

```
  const float PI=3.14159;
  float A, C, V ;
  printf("C-circumference of a circle\n A-area of a circle\n V-volume of a
sphere\n");
  printf("Choose a type: ");
  scanf ("%s",&ch);
  printf ("Enter radius: ");
  scanf("%d",&r);
  switch(ch)
  {
    case 'A':printf("Area of a circle = %.2f", A, A-PI*r*r);break;
    case 'C':printf("Circumference of a circle = %.2f",C,C=2*PI*r);break;
    case 'V':printf("Volume of a sphere = %.2f",V,V=(4*PI*r*r*r)/3);break;
    default:printf("Invalid value");
  }

  return 0;
}
```

4. Write a C program to read a character from the user and determine whether the given letter is vowel or not. (Use a switch statement which also includes 'default' state)

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

int main()
{
   char l;
   printf("Enter a character ");
   scanf("%c",&l);
   switch(l)
   {
      case 'A':printf("%c is a vowel ",l);break;
      case 'a':printf("%c is a vowel ",l);break;
      case 'E':printf("%c is a vowel ",l);break;
      case 'e':printf("%c is a vowel ",l);break;
      case 'I':printf("%c is a vowel ",l);break;
      case 'i':printf("%c is a vowel ",l);break;
      case 'O':printf("%c is a vowel ",l);break;
      case 'o':printf("%c is a vowel ",l);break;
      case 'U':printf("%c is a vowel ",l);break;
      case 'u':printf("%c is a vowel ",l);break;
      default:printf("%c is not a vowel ",l);break;}
```

```
  return 0;
}
```

5. Write a C program to enter month number and print total number of days in month using switch case. First assume that the given month belongs to a non-leap year

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
  int m_no;
  printf("Enter a month number ");
  scanf("%d",&m_no);
  switch(m_no)
  {
    case 1:printf("January has 31 days");break;
    case 2:printf("February has 28 days");break;
    case 3:printf("March has 31 days");break;
    case 4:printf("April has 30 days");break;
    case 5:printf("May has 31 days");break;
```

```
   case 6:printf("June has 30 days");break;
   case 7:printf("July has 31 days");break;
   case 8:printf("August has 31 days");break;
   case 9:printf("September has 30 days");break;
   case 10:printf("October has 31 days");break;
   case 11:printf("November has 30 days");break;
   case 12:printf("December has 31 days");break;
   default:printf("Invalid month number");break;}

  return 0;
}
```

Practical Number 5

Section A

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)

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
   //while loop
```

```
    int x=0;
    while(x<=100)
    {
       printf(" %d",x);
       x++;
    }

    //do while loop
    int x=0;
    do
    {
       printf("%d",x);
       x++;
    }while(x<=100);

    //for loop
    int x;
    for(x=0;x<=100;x++)
    {
       printf("%d",x);
    }

    return 0;
}
```

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!”

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
   int no,counter=1,sum=0;
   float avg;
   while(counter<=10)
   {
   printf("Enter %d mark ",counter);
   scanf("%d",&no);
   sum =sum+no;
   counter++;
   avg=(float)sum /10;
   }
   printf("Total is %d \n Average is %.2f",sum,avg);
   if(avg<50)
   printf("\n Fail");
   else
   printf("\n Pass");
```

```
    return 0;
}
```

3. Write a C program to calculate factorial of a user given number. Hint: Select an appropriate looping structure. Factorial of ‘0’ is ‘1’ (0! = 1) Ex: factorial of number 5 is calculated as 5! = 5*4*3*2*1

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int n,total=1;
    printf("Enter numer ");
    scanf("%d",&n);
    if(n<0)
    {
        printf("Invalid input ");
    }
    else
    {
        for(int i=1; i<=n; i++)
        {
```

```
        total=i*total;
      }
   }
   {
   printf("factorial of %d is %d",n,total);
   }

   return 0;
}
```

4. Write a C program to calculate the sum of all digits of a user given number. If user input 123 your program should output 6. (calculated as 1+2+3)

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
   int n,sum=0;
   printf("Enter a number ");
   scanf("%d",&n);
   while(n!=0)
   {
      sum+=n%10;
```

```
        n/=10;
    }
    printf("Sum of digits: %d\n",sum);
    return 0;
}
```

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

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int n,rno=0;
    printf("Enter a number ");
    scanf("%d",&n);
    do {
        int digit=n%10;
        rno=rno*10+digit;
        n/=10;
    } while (n!= 0);
    printf("Reversed number: %d\n",rno);
```

```
    return 0;
}
```

6. Write a C program to calculate nth power of a given integer. The user input base and exponent. (Do NOT use inbuilt functions, instead use a loop)

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int count, power, base, result=1;
    printf ("Enter the base value ");
    scanf ("%d",&base);
    printf ("Enter the power value ");
    scanf ("%d",&power);
    for (count=1; count<=power;count++)
    {
      result=result*base;
    }
    printf("Value is %d",result);

    return 0;
```

```
}
```

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

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
   int num1=0,num2=1,n,count;

   printf("Fibonacci Sequence ");

   for (count=0;count<10;count++) {
      if (count<=1) {
         n=count;
      } else
      {
         n=num1+num2;
         num1=num2;
         num2=n;
      }
```

```
        printf("%d",n);
    }
    return 0;
}
```

8. Write a C program to check whether a given number is an Armstrong Number! (Refer to previous flowcharts)

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int no,mod,total=0,x;
    printf("Enter the number ");
    scanf("%d",&no);
    x=no;
    while(no)
    {
        mod=no%10;
        total=total+(mod*mod*mod);
        no=no/10;
```

```
    }
    printf("%d",no);
    if(x==total)
      printf("%d is a armstrong number ",x);
    else
      printf("%d is not a armstrong number ",x);
    return 0;
}
```

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

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    char letter;
    printf("ASCII values for letters A to Z \n");
    for (letter='A';letter<='Z';letter++)
    {
       printf("%c %d\n",letter,letter);
    }
    return 0;
```

```
}
```

10. Write a program to print this pattern.

```
*

**

***

****

*****
```

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int rows;
    printf("Enter the number of row ");
    scanf("%d",&rows);
    for(int x=1;x<=rows;x++)
    {
       for(int y=1;y<=x;y++)
       {
          printf("*");
       }
```

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

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

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
   int no,count=2,prime=1;
   printf("Enter a number ");
   scanf("%d",&no);
   while(count<no)
   {
      if(no%count==0)
   {
      prime=0;
      break;
   }
```

```
        count++;
    }
    if(prime)
        printf("%d is a prime number",no);
    else
        printf("%d is not a prime number",no);
    return 0;
}
```

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

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int no,count=1;
    printf("Enter a number ");
    scanf("%d",&no);
    printf("Factors of %d \n",no);
    while(count<=no)
    {
        if(no%count==0)
```

```
        {
            printf("%d \n",count);
        }
        count++;
    }
    return 0;
}
```

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

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int sum,x;
    while(x>0){
    printf("Enter a number ");
    scanf("%d",&x);
    if(x!=1)
    sum=sum+x;
    }
    printf("Sum of the entered  numbers %d ",sum);
```

```
    return 0;
}
```

13. Write a C program to read user inputs for an integer array (size = 10) and print the array

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int x,arr[10];
    printf("Input 10 elements in the array \n");
    for(x=0;x<10;x++)
    {
            printf("element %d ",x);
       scanf("%d",&arr[x]);
    }

    printf("Elements in array are: ");
    for(x=0;x<10;x++)
    {
       printf("%d",arr[x]);
    }
```

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

14. Re-Write the above code to count all the even numbers in above integer array and display the count

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int no[10],count=1;
    do
    {
        printf("Enter %d number :",count);
        scanf("%d",&no[10]);
        count++;
    }while(count<=10);
    for(count=1;count<10;count++);
    printf("The %d is %d\n",count,no[10]);
    return 0;
}
```

Section B

1. Input 10 numbers and to output number of positive, number of negative, number of zeros

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
   int limit,num,p=0,n=0,z=0;
   printf("Enter the limit\n");
   scanf("%d",&limit);

   printf("Enter %d numbers\n",limit);
   while(limit)
   {
      scanf("%d", &num);
      if(num > 0)
      {
         p++;
      }
      else if(num < 0)
```

```
        {
            n++;
        }
        else
        {
            z++;
        }

        limit--;
    }
    printf("Positive Numbers %d \n",p);
    printf("Negative Numbers %d \n",n);
    printf("Number of zero %d \n",z);
    return 0;
}
```

2. Input Marks of 10 students and output the maximum , minimum and average Marks

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
```

```
    float avg;
    int i,n,count=0,sum=0,num,min,max;
    printf("Please enter the number of subjects ");
    scanf("%d",&n);
    printf("Please enter %d numbers ",n);
    while(count<n)
    {
       min=0;
       max=0;
          if(num>max)
             max=num;
          if(num<min)
             min=num;
          scanf("%d",&num);
       sum=sum+num;
       count++;
    }
       avg= 1.0*sum/n;
    printf("Average is %.2f \n",avg);
    printf("Maximum number is %d \n",max);
    printf("Minimum number is %d \n",min);
    return 0;
}
```

3.Input price of 10 items and display the average value of an Item , number of items which the price is greater than 200.

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
   int i,n,sum=0;
         float avg;
         printf("Enter the 10 numbers \n");
         for (i=1;i<=10;i++)
         {
            printf("Number-%d ",i);
      scanf("%d",&n);
                  sum +=n;
         }
         avg=sum/10.0;
         printf("The sum is %d \n",sum);
         printf("Average is %f \n",avg);

   return 0;
}
```

4. Input the Employee no and the Basic Salary of the Employees in an organisation ending with the dummy value -999 for Employee no and count the number Employees whose Basic Salary >=5000

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
        int empno,bs,count=0;
   while (1) {
      printf("Employee number: ");
      scanf("%d",&empno);

      if (empno==-999) {
         break;
      }

      printf("Basic salary ");
      scanf("%d",&bs);

      if (bs>=5000) {
```

```
            count++;
        }
    }
    printf("Number of employees %d\n", count);
    return 0;
}
```

5. Input employee number, and hours worked by employees, and to display the following: Employee number, Over Time Payment, and the percentage of employees whose Over Time Payment exceeding the Rs. 4000/-. The user should input –999 as employee number to end the program, and the normal Over Time Rate is Rs.150 per hour and Rs. 200 per hour for hours in excess of 40

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int empno=0,ttl;
    float hours,o,p;
```

```
    while(empno!=-999){
        printf("Enter the employee no ");
        scanf("%d",&empno);
        printf("Enter the No of hours ");
        scanf("%f",&hours);
        if(hours<40){
            o=hours*150.00;
        }
        else
            o=((hours-40)*200)+(hours*150.00);
        if(o>4000){
            p+=1;
            ttl+=1;
        }
        else
            ttl+=1;
    }
    printf("Employee no %d \n",empno);
    printf("Over time payment: %.2f\n",o);
    printf("Percentage of employees %.2f%%\n\n",(p/ttl)*100);
    return 0;
}
```