**LAB 9**

**Objectives**

To implement recursive function

To implement overloaded function

***Recursive function***

**Task 1**

Write a recursive function that prints alphabets from A to J.

#include<iostream>

using namespace std;

char reverse(char x)

{

if (x=='J')

{

cout<<x<<endl;

return x;

}

else

{

cout<<x<<endl;

reverse(x+1);

}

}

void main()

{

char a;

cout<<"Enter Alphabet Maximum Range of J: ";

cin>>a;

reverse(a);

system("pause");

}

Write a recursive function that prints alphabets from A to J in reverse order.

#include<iostream>

using namespace std;

char reverse(char x)

{

if (x=='A')

{

cout<<x<<endl;

return x;

}

else

{

cout<<x<<endl;

reverse(x-1);

}

}

void main()

{

char a;

cout<<"Enter Alphabet in Reverse Order: ";

cin>>a;

reverse(a);

system("pause");

}

**Task 2**

Write a recursive function that computes the factorial of number given by user.

#include<iostream>

using namespace std;

int factorial(int x)

{

int f;

if (x==1)

{

cout<<x<<endl;

return 1;

}

else

{

cout<<x<<"\*";

f=x\*factorial(x-1);

}

}

void main()

{

int a,fact;

cout<<"Enter number: ";

cin>>a;

cout<<"\n"<<a<<"! = ";

fact=factorial(a);

cout<<a<<"! = "<<fact<<endl;

cout<<"\n\nFactorial of "<<a<<" is "<<fact<<endl;

cout<<"\n";

system("pause");

}

**Task 3**

Write a recursive function that prints the fabonic series.

You have to print the series uptill the number entered by user.

#include<iostream>

using namespace std;

int fabonic(int n)

{

int a=0,b=1,c=0,f;

n=n-2;

for(int i=1;i<=n;i++)

{

c = a + b;

a = b;

b = c;

cout<<c<<endl;

}

return c;

}

int main()

{

int n;

cout<<"Enter number: ";

cin>>n;

int a=0;

int b=1;

cout<<a<<endl;

cout<<b<<endl;

fabonic(n);

system ("pause");

}

#include<iostream>

using namespace std;

int fabonic(int n,int a,int b,int c)

{

int f;

if (n==0)

{

return 0;

}

else

{

c = a + b;

a = b;

b = c;

cout<<c<<endl;

f=fabonic(n-1,a,b,c);

}

}

int main()

{

int n;

cout<<"Enter number: ";

cin>>n;

int a=0,b=1,c=0;

cout<<a<<endl;

cout<<b<<endl;

n=n-2;

fabonic(n,a,b,c);

system ("pause");

}

***Function Overloading***

**Task 4**

Write overeloaded function that computes the average of 10 integers and average of 10 float numbers.

#include<iostream>

using namespace std;

int average(int n1,int n2,int n3,int n4,int n5,int n6,int n7,int n8,int n9,int n10);

float average(float m1,float m2,float m3,float m4,float m5,float m6,float m7,float m8,float m9,float m10);

void main()

{

int a,n1,n2,n3,n4,n5,n6,n7,n8,n9,n10;

float b,m1,m2,m3,m4,m5,m6,m7,m8,m9,m10;

cout<<"Enter Ten Integer Number"<<endl;

cin>>n1;

cin>>n2;

cin>>n3;

cin>>n4;

cin>>n5;

cin>>n6;

cin>>n7;

cin>>n8;

cin>>n9;

cin>>n10;

cout<<"\nEnter Ten Float Number"<<endl;

cin>>m1;

cin>>m2;

cin>>m3;

cin>>m4;

cin>>m5;

cin>>m6;

cin>>m7;

cin>>m8;

cin>>m9;

cin>>m10;

a=average(n1,n2,n3,n4,n5,n6,n7,n8,n9,n10);

b=average(m1,m2,m3,m4,m5,m6,m7,m8,m9,m10);

cout<<"\nAverage of Ten Integer Number is "<<a<<endl;

cout<<"Average of Ten Float Number is "<<b<<endl;

system("pause");

}

int average(int n1,int n2,int n3,int n4,int n5,int n6,int n7,int n8,int n9,int n10)

{

int x= (n1+n2+n3+n4+n5+n6+n7+n8+n9+n10)/10;

return x;

}

float average(float m1,float m2,float m3,float m4,float m5,float m6,float m7,float m8,float m9,float m10)

{

float y= (m1+m2+m3+m4+m5+m6+m7+m8+m9+m10)/10;

return y;

}

#include<iostream>

using namespace std;

int average(int arr1[]);

float average(float arr2[]);

void main()

{

int x,arr1[10];

float y,arr2[10];

cout<<"Enter 10 integer numbers "<<endl;

for(int i=0;i<10;i++)

{

cout<<"\t ";

cin>>arr1[i];

}

cout<<"\n"<<endl;

cout<<"Enter 10 float numbers "<<endl;

for(int j=0;j<10;j++)

{

cout<<"\t ";

cin>>arr2[j];

}

cout<<"\n"<<endl;

x=average(arr1);

y=average(arr2);

cout<<"Average of 10 integer number is "<<x<<endl;

cout<<"Average of 10 float number is "<<y<<endl;

system("pause");

}

int average(int arr1[])

{

int avg,sum=0;

for(int i=0;i<10;i++)

{

sum=sum+arr1[i];

}

avg=sum/10;

return avg;

}

float average(float arr2[])

{

float avg,sum=0;

for(int j=0;j<10;j++)

{

sum=sum+arr2[j];

}

avg=sum/10;

return avg;

}

**Task 5**

Write overeloaded functions **Area**that calculate the area of circle ,rectangle and triangle.

Area of circle = 3.14\*r\*r

Area of rectangle = width\*height

Area of triangle = ½ height\*base

#include<iostream>

using namespace std;

float area(float r);

float area(float h1,float w);

float area(float h2,int b);

void main()

{

float r,w,h1,h2,i,j,k;

int b;

cout<<"Enter radius for circle : ";

cin>>r;

cout<<"Enter height for rectangle : ";

cin>>h1;

cout<<"Enter width for rectangle: ";

cin>>w;

cout<<"Enter height for triangle : ";

cin>>h2;

cout<<"Enter base for triangle : ";

cin>>b;

i=area(r);

j=area(h1,w);

k=area(h2,b);

cout<<"\nArea of Circle is is "<<i<<endl;

cout<<"Area of Rectangle is "<<j<<endl;

cout<<"Area of Tringle is "<<k<<endl;

system("pause");

}

float area(float r)

{

float x;

x=3.14\*r\*r;

return x;

}

float area(float h1,float w)

{

float y;

y=w\*h1;

return y;

}

float area(float h2,int b)

{

float z;

z=(h2\*b)/2;

return z;

}

**Task 6**

Write overeloaded function that computes the Percentage of three courses and percentage of five courses.

#include<iostream>

using namespace std;

float percentage(float c1,float c2,float c3);

float percentage(float c1,float c2,float c3,float c4,float c5);

void main()

{

float a,b,c1,c2,c3,c,c4,c5;

cout<<"Enter course 1: ";

cin>>c1;

cout<<"Enter course 2: ";

cin>>c2;

cout<<"Enter course 3: ";

cin>>c3;

cout<<"Enter course 4: ";

cin>>c4;

cout<<"Enter course 5: ";

cin>>c5;

a=percentage(c1,c2,c3);

b=percentage(c1,c2,c3,c4,c5);

cout<<"\nPercentage of Three Cources is "<<a<<endl;

cout<<"Percentage of Five Cources is "<<b<<endl;

system("pause");

}

float percentage(float c1,float c2,float c3)

{

float x;

x=(c1+c2+c3)\*100/300;

return x;

}

float percentage(float c1,float c2,float c3,float c4,float c5)

{

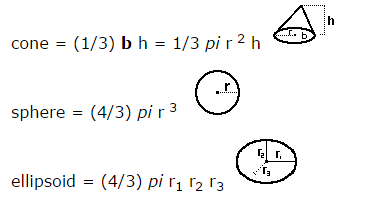
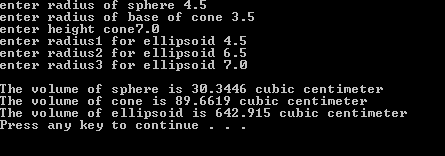
float y;

y=(c1+c2+c3+c4+c5)\*100/500;

return y;

}

**Task 7**

Write overeloaded function **Volume** that alculates the volume of cone, sphere and ellipsoid.Formulae are given below.

#include<iostream>

using namespace std;

float volume(float r);

float volume(float b,float h);

float volume(float r1,float r2,float r3);

void main()

{

float b,h,r,r1,r2,r3,i,j,k;

cout<<"Enter radius of sphere: ";

cin>>r;

cout<<"Enter radius of cone of base: ";

cin>>b;

cout<<"Enter height of cone: ";

cin>>h;

cout<<"Enter radius1 for ellipsoid: ";

cin>>r1;

cout<<"Enter radius2 for ellipsoid: ";

cin>>r2;

cout<<"Enter radius3 for ellipsoid: ";

cin>>r3;

i=volume(r);

j=volume(b,h);

k=volume(r1,r2,r3);

cout<<"\nThe volume of sphere is "<<i<<" cubic centimeter"<<endl;

cout<<"The volume of cone is "<<j<<" cubic centimeter"<<endl;

cout<<"The volume of ellipsoid is "<<k<<" cubic centimter"<<endl;

system("pause");

}

float volume(float r)

{

float x;

x=(r\*r\*r\*3.14\*4)/3;

return x;

}

float volume(float b,float h)

{

float y;

y=(b\*b\*h\*3.14)/3;

return y;

}

float volume(float r1,float r2,float r3)

{

float z;

z=(4/3)\*3.14\*r1\*r2\*r3;

return z;

}