PROGRAM: 4

14-04-2019 **SHAPE AREA CALCULATION**

Objective:

System Create Shape Area Calculation System (SACS), in C++ that will ask a user to select a shape and enter the parameters associated with the selected shape, one by one. The user is expected to first select a shape from 6 candidate shapes: Triangle, Rectangle, Trapezoid, Circle, Ellipse and Parallelogram. The program should then display the selected shape and ask the user for the associated parameters calculating the area. Once the area has been calculated, the program should correctly display the area for the user. For example if a user selects Rectangle and enters “32.5”and “21.0” as the length and width of the rectangle, the program should be able to display an area of 682.50 for the user. Your program should be able to handle error such as invalid inputs, undefined shapes etc. and invalid edge relationships of shapes. Use the concept of Function Overloading.

SOURCE CODE:

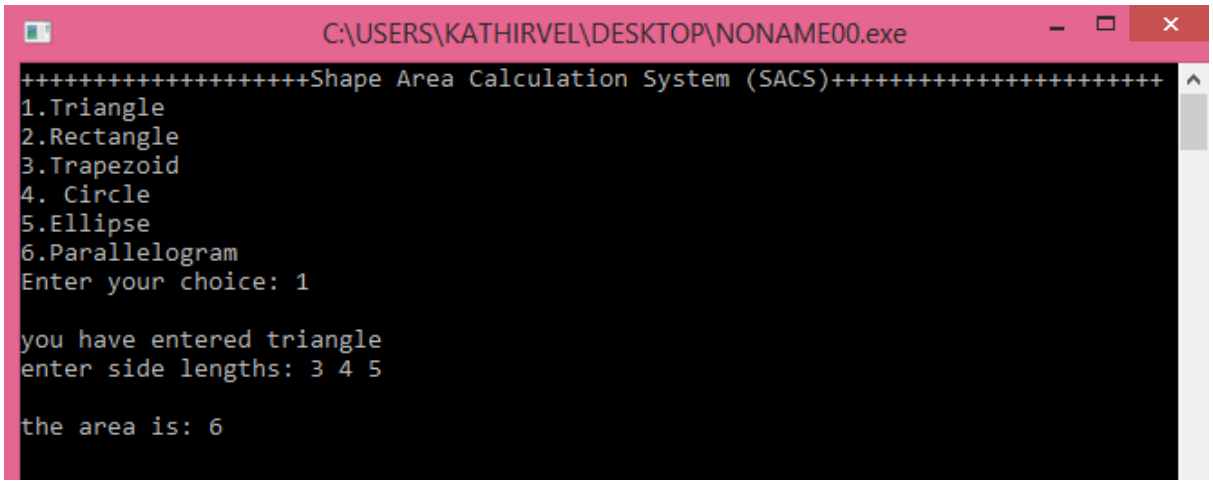
```
#include<iostream.h>
#include<conio.h>
#include<math.h>
float area( float a, float b, float c)
{
float s,ret;
s=(a+b+c)/2;
ret=sqrt(s*(s-a)*(s-b)*(s-c));
return ret;
}
float area ( int a, int b)
{return (a*b);}
float area(long a,long b, long c)
```

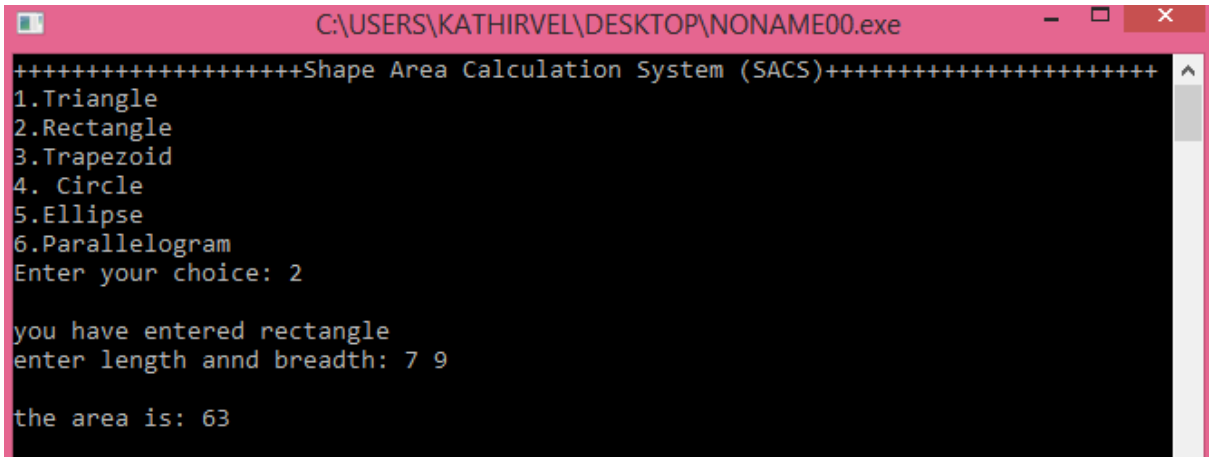
```
{int r1;
r1=0.5*(a+b)*c;
return r1;
}
float area(float a)
{return (3.14*a*a);}
float area (float a,float b)
{return (3.14*a*b);}
double area (double a, double b)
{return(a*b);}
void main()
{cout<<"++++++++++++++++++++Shape Area Calculation System (SACS)++++++++++++++++++++++";
cout<<"\n1.Triangle";
cout<<"\n2.Rectangle";
cout<<"\n3.Trapezoid";
cout<<"\n4. Circle";
cout<<"\n5.Ellipse";
cout<<"\n6.Parallelogram";
cout<<"\nEnter your choice: ";
int cho,a;
cin>>cho;
if(cho==1)
{float x,y,z;
cout<<"\nyou have entered triangle";
```

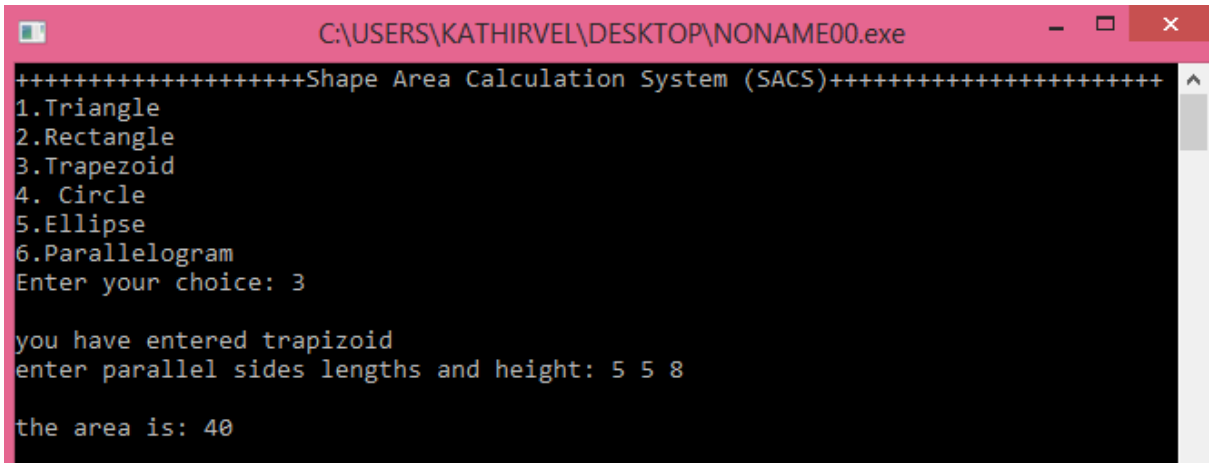
```
cout<<"\nenter side lengths: ";
cin>>x>>y>>z;
a=area(x,y,z);
}
if(cho==2)
{int m,n;
cout<<"\nyou have entered rectangle";
cout<<"\nenter length annd breadth: ";
cin>>m>>n;
a=area(m,n);
}
if(cho==3)
{long p,q,r;
cout<<"\nyou have entered trapizoid";
cout<<"\nenter parallel sides lengths and height: ";
cin>>p>>q>>r;
a=area(p,q,r);
}
if(cho==4)
{float h;
cout<<"\nyou have entered circle";
cout<<"\nenter radius: ";
cin>>h;
a=area(h);
}
```

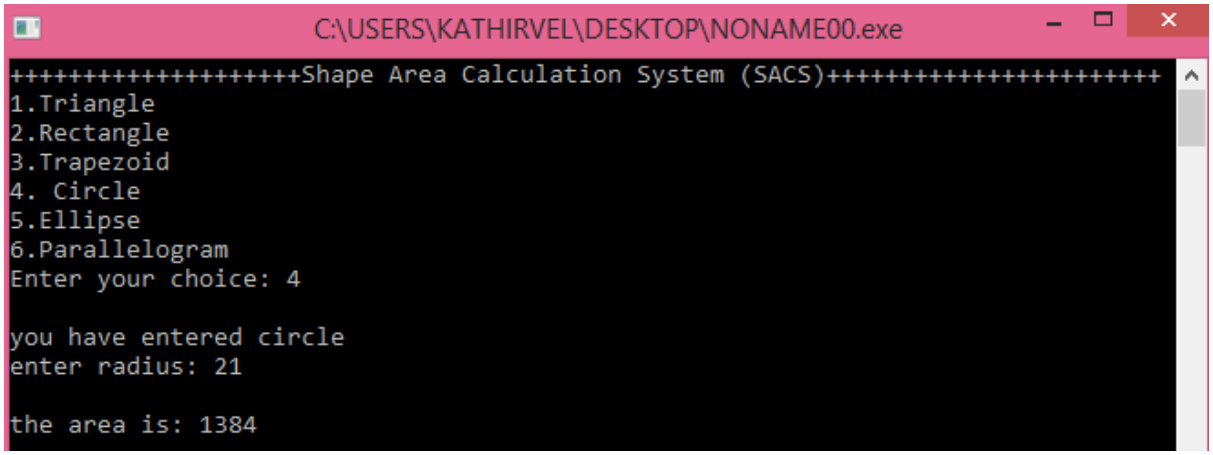
```
if(cho==5)
{float a1,b1;
cout<<"\nyou have entered ecllipse";
cout<<"\nenter semimajor axis annd semiminor axis: ";
cin>>a1>>b1;
a=area(a1,b1);
}
if(cho==6)
{double a2,b2;
cout<<"\nyou have entered parallelogram: ";
cout<<"\nenter height annd base: ";
cin>>a2>>b2;
a=area(a2,b2);
}
cout<<"\nthe area is: ";
cout<<a;
getch();
}
```

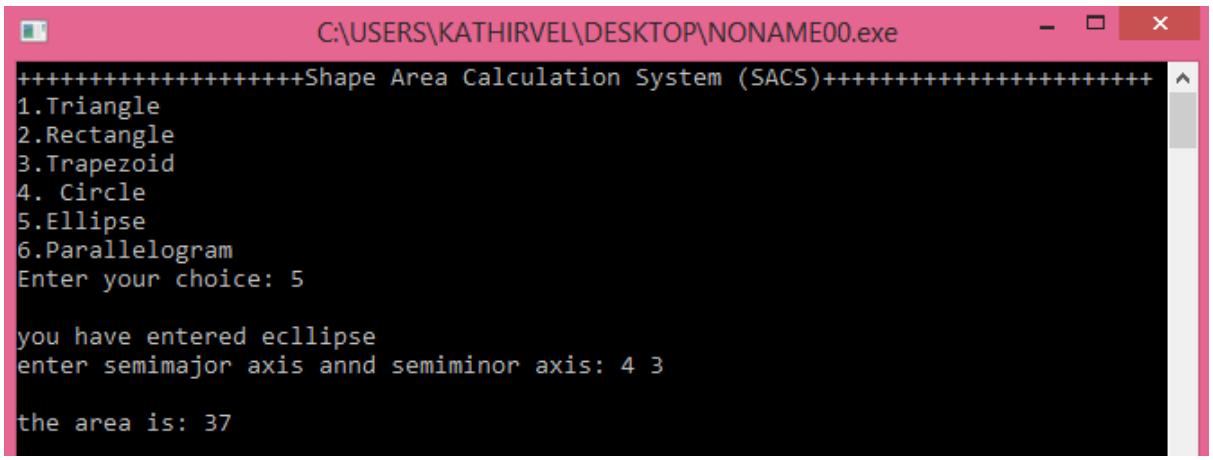
Sample output:

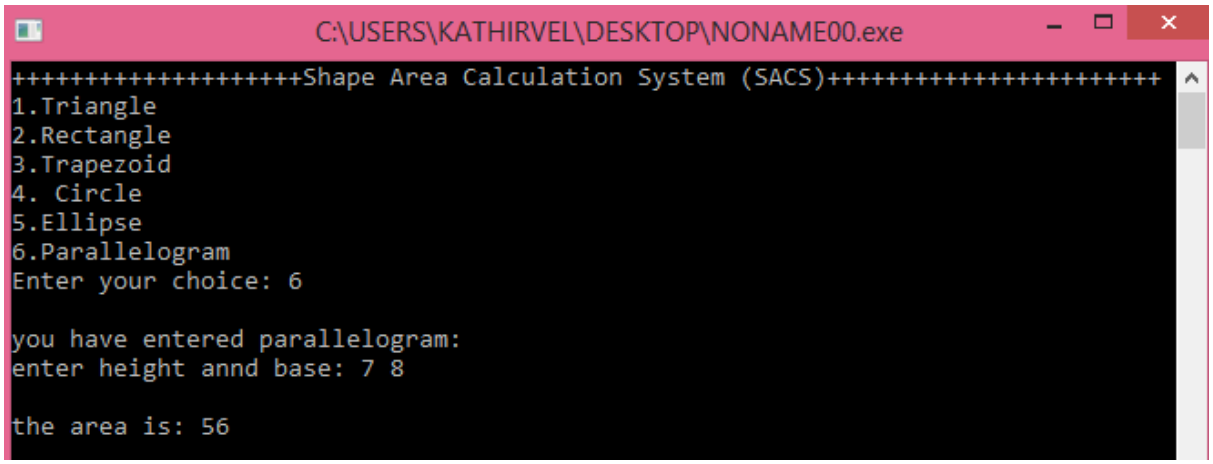







C:\USERS\KATHIRVEL\DESKTOP\NONAME00.exe
++++++++++++++++++++Shape Area Calculation System (SACS)++++++++++++++++++++++
1.Triangle
2.Rectangle
3.Trapezoid
4. Circle
5.Ellipse
6.Parallelogram
Enter your choice: 4
you have entered circle
enter radius: 21
the area is: 1384


C:\USERS\KATHIRVEL\DESKTOP\NONAME00.exe
++++++++++++++++++++Shape Area Calculation System (SACS)++++++++++++++++++++++
1.Triangle
2.Rectangle
3.Trapezoid
4. Circle
5.Ellipse
6.Parallelogram
Enter your choice: 5
you have entered ecllipse
enter semimajor axis annd semiminor axis: 4 3
the area is: 37


C:\USERS\KATHIRVEL\DESKTOP\NONAME00.exe
++++++++++++++++++++Shape Area Calculation System (SACS)++++++++++++++++++++++
1.Triangle
2.Rectangle
3.Trapezoid
4. Circle
5.Ellipse
6.Parallelogram
Enter your choice: 6
you have entered parallelogram:
enter height annd base: 7 8
the area is: 56