

Activities Text Editor Oct 31 17:35 Assignment6.cpp Save

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```
1 #include <iostream>
2 #include <cmath>
3
4 class Shape {
5 protected:
6     double area;
7     double perimeter;
8
9 public:
10     virtual void CalculateArea() = 0;
11     virtual void CalculatePerimeter() = 0;
12 };
13
14 class Circle : public Shape {
15 private:
16     double radius;
17
18 public:
19     Circle(double r) : radius(r) {}
20
21     void CalculateArea() {
22         area = 3.14159 * radius * radius;
23     }
24
25     void CalculatePerimeter() {
26         perimeter = 2 * 3.14159 * radius;
27     }
28
29     void PrintInfo() {
30         std::cout << "Circle - Radius: " << radius << ", Area: " << area << ", Perimeter: " << perimeter << std::endl;
31     }
32 };
33
34 class Triangle : public Shape {
35 private:
36     double s1, s2, s3;
37
38 public:
39     Triangle(double a, double b, double c) : s1(a), s2(b), s3(c) {}
40
41     void CalculateArea() {
42         double s = (s1 + s2 + s3) / 2;
43         area = sqrt(s * (s - s1) * (s - s2) * (s - s3));
44     }
45
46     void CalculatePerimeter() {
47         perimeter = s1 + s2 + s3;
48     }
49 }
```

C++ Tab Width: 8 Ln 1, Col 1 INS

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```
47 perimeter = s1 + s2 + s3;
48 }
49
50 void PrintInfo() {
51     std::cout << "Triangle - Sides: " << s1 << ", " << s2 << ", " << s3 << ", Area: " << area << ", Perimeter: " << perimeter << std::endl;
52 }
53 };
54
55 class Polygon : public Shape {
56 private:
57     int numSides;
58     double sideLength;
59
60 public:
61     Polygon(int sides, double length) : numSides(sides), sideLength(length) {}
62
63     void CalculateArea() {
64         area = (numSides * sideLength * sideLength) / (4 * tan(3.14159 / numSides));
65     }
66
67     void CalculatePerimeter() {
68         perimeter = numSides * sideLength;
69     }
70
71     void PrintInfo() {
72         std::cout << "Polygon - Sides: " << numSides << ", Side Length: " << sideLength << ", Area: " << area << ", Perimeter: " << perimeter << std::endl;
73     }
74 };
75
76 int main() {
77     Circle circle(5.0);
78     Triangle triangle(3.0, 4.0, 5.0);
79     Polygon square(4, 4.0);
80     Polygon octagon(8, 3.0);
81
82     circle.CalculateArea();
83     circle.CalculatePerimeter();
84     triangle.CalculateArea();
85     triangle.CalculatePerimeter();
86     square.CalculateArea();
87     square.CalculatePerimeter();
88     octagon.CalculateArea();
89     octagon.CalculatePerimeter();
90
91     circle.PrintInfo();
92     triangle.PrintInfo();
93     square.PrintInfo();
94     octagon.PrintInfo();
95
96     return 0;
97 }
```

C++Tab Width: 8Ln 1, Col 1INS

Activities Terminal

Oct 31 17:35

student@coep-HLBS-CM-44: ~

```
student@coep-HLBS-CM-44:~$ gedit Assignment6.cpp
^C
student@coep-HLBS-CM-44:~$ g++ Assignment6.cpp -o Assignment6
student@coep-HLBS-CM-44:~$ ./Assignment6
Circle - Radius: 5, Area: 78.5397, Perimeter: 31.4159
Triangle - Sides: 3, 4, 5, Area: 6, Perimeter: 12
Polygon - Sides: 4, Side Length: 4, Area: 16, Perimeter: 16
Polygon - Sides: 8, Side Length: 3, Area: 43.4559, Perimeter: 24
student@coep-HLBS-CM-44:~$
```