

Philip Pesic

Week 6

September 25 2022

Week 6 Prog 4

Convert problems 3,5,6,7 in to template classes, of week 5.

Test each with Implicit int, float, double, long int.

```
//
```

```
// main.cpp
```

```
// Week 6 Prog 4
```

```
//
```

```
// Created by Pippo Pesic on 9/25/22.
```

```
//
```

```
#include <iostream>
```

```
using namespace std;
```

```
template <class T>
```

```
class circle {
```

```
    T radius;
```

```
public:
```

```
    T getRadius(void) {return radius;}
```

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```
void setRadius(T inRadius) {radius = inRadius;}

T calcCircumference() {
    T circumference = radius * 3.14159;
    return circumference;
}

T calcArea() {
    T area = 3.14159 * (radius^2);
    return area;
}

T calcDiameter() {
    T diameter = radius * 2;
    return diameter;
}

};
```

```
int main() {
    circle<double> c1;
    c1.setRadius(5);
```

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```
    cout << "Radius = " << c1.getRadius() << endl;

    cout << "Circumference = " << c1.calcCircumference() << endl;

    cout << "Area = " << c1.calcArea() << endl;

    cout << "Diameter = " << c1.calcDiameter() << endl;


    circle<int> c2;

    cout << "Radius = " << c2.getRadius() << endl;

    cout << "Circumference = " << c2.calcCircumference() << endl;

    cout << "Area = " << c2.calcArea() << endl;

    cout << "Diameter = " << c2.calcDiameter() << endl;


    cout << "Philip Pesic 9/25/22" << endl;

    return 0;

}
```

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```
10
11 template <class T>
12 class circle {
13     T radius;
14 public:
15     T getRadius(void) {return radius;}
16     void setRadius(T inRadius) {radius = inRadius;}
17
18     T calcCircumference() {
19         T circumference = radius * 3.14159;
20         return circumference;
21     }
22
23     T calcArea() {
24         T area = 3.14159 * (radius*2);
25         return area;
26     }
27
28     T calcDiameter() {
29         T diameter = radius * 2;
30         return diameter;
31     }
32 };
33
34
35 int main() {
36     circle<double> c1;
37     c1.setRadius(5);
38     cout << "Radius = " << c1.getRadius() << endl;
39     cout << "Circumference = " << c1.calcCircumference() << endl;
40     cout << "Area = " << c1.calcArea() << endl;
41     cout << "Diameter = " << c1.calcDiameter() << endl;
42
43     circle<int> c2;
44     cout << "Radius = " << c2.getRadius() << endl;
45     cout << "Circumference = " << c2.calcCircumference() << endl;
46     cout << "Area = " << c2.calcArea() << endl;
47     cout << "Diameter = " << c2.calcDiameter() << endl;
48
49     cout << "Philip Pesic 9/25/22" << endl;
50     return 0;
51 }
52
53
```

Area = 21  
Diameter = 10  
Radius = 5  
Circumference = 31.4159  
Area = 9  
Diameter = 2  
Philip Pesic 9/25/22  
Program ended with exit code: 0

I learned: how to write templates and template classes

circle
-radius: T;
+calcArea (area: T) return pi * radius^2 +calcCircumference (circumference: T) return 2*pi*radius +calcDiameter (diameter: T) return 2*radius