

Source File: ~/1337/62/lab62.(C|CPP|cpp|c++|cc|cxx|cp)
Input: Under control of main function
Output: Under control of main function
Value: 2

The purpose of this assignment is to develop the implementation for the `Circle` class. A header file containing the specification is shown in Figure 1, a sample `main` function for testing your implementation is shown in Figure 2, and a sample execution sequence is shown in Figure 3. To use the `Makefile` as distributed in class, add a target of `lab62` to `targets2srcfiles`.

```
1 #ifndef LAB62_H
2 #define LAB62_H
3
4 #include <cmath>
5
6 using namespace std;
7
8 const double PI = acos(-1.0);
9
10 class Circle
11 {
12 public:
13     Circle(); // default constructor; sets radius to 0.0
14     Circle(double r); // constructor; Initializes radius to r
15     double getRadius() const; // returns radius
16     void setRadius(double x); // if x >= 0 sets radius to x else sets
17                               // radius to 0.0
18     double diameter() const; // returns the diameter of the circle
19     double area() const; // returns the area of the circle
20     double circumference() const; // returns the circumference of the circle
21 private:
22     double radius;
23 };
24
25 #endif
```

Figure 1. /usr/local/1337/include/lab62.h

```
1 #include <iostream>
2 #include <iomanip>
3 #include <lab62.h>
4
5 using namespace std;
6
7 int main()
8 {
9     Circle circle1(5.0), circle2, circle3(-5.25);
10    double r;
11
```

Figure 2. /usr/local/1337/src/lab62main.C (Part 1 of 2)

```
12  cout << fixed << showpoint << setprecision(3);
13
14  cout << "radius of circle1 = " << circle1.getRadius() << endl;
15  cout << "radius of circle2 = " << circle2.getRadius() << endl;
16  cout << "radius of circle3 = " << circle3.getRadius() << endl << endl;
17
18  while (cin >> r)
19  {
20      circle2.setRadius(r);
21      cout << "radius = " << circle2.getRadius() << endl;
22      cout << "diameter = " << circle2.diameter() << endl;
23      cout << "area = " << circle2.area() << endl;
24      cout << "circumference = " << circle2.circumference() << endl << endl;
25  }
26
27  return 0;
28 }
```

Figure 2. /usr/local/1337/src/lab62main.C (Part 2 of 2)

```
1  newuser@csunix ~> cd 1337
2  newuser@csunix ~/1337> mkdir 62
3  newuser@csunix ~/1337> cd 62
4  newuser@csunix ~/1337/62> cp /usr/local/1337/data/62/* .
5  newuser@csunix ~/1337/62> cp /usr/local/1337/include/lab62.h .
6  newuser@csunix ~/1337/62> cp /usr/local/1337/src/lab62main.C .
7  newuser@csunix ~/1337/62> cp /usr/local/1337/src/Makefile .
8  newuser@csunix ~/1337/62> touch lab62.cpp
9  newuser@csunix ~/1337/62> # Edit Makefile and lab62.cpp
10 newuser@csunix ~/1337/62> make lab62
11 g++ -g -Wall -std=c++11 -c lab62main.C -I/usr/local/1337/include -I.
12 g++ -g -Wall -std=c++11 -c lab62.cpp -I/usr/local/1337/include -I.
13 g++ -o lab62 lab62main.o lab62.o -L/usr/local/1337/lib -lm -lbits
14 newuser@csunix ~/1337/62> cat 01.dat
15 -1.25
16 0.0
17 1
18 1.25
19 2.625
20 newuser@csunix ~/1337/62> cat 01.dat | ./lab62
21 radius of circle1 = 5.000
22 radius of circle2 = 0.000
23 radius of circle3 = 0.000
24
```

Figure 3. Commands to Compile, Link, & Run Lab 62 (Part 1 of 2)

```
25 radius = 0.000
26 diameter = 0.000
27 area = 0.000
28 circumference = 0.000
29
30 radius = 0.000
31 diameter = 0.000
32 area = 0.000
33 circumference = 0.000
34
35 radius = 1.000
36 diameter = 2.000
37 area = 3.142
38 circumference = 6.283
39
40 radius = 1.250
41 diameter = 2.500
42 area = 4.909
43 circumference = 7.854
44
45 radius = 2.625
46 diameter = 5.250
47 area = 21.648
48 circumference = 16.493
49
50 newuser@csunix ~/1337/62> cat 01.dat | ./lab62 > my.out
51 newuser@csunix ~/1337/62> diff 01.out my.out
52 newuser@csunix ~/1337/62>
```

Figure 3. Commands to Compile, Link, & Run Lab 62 (Part 2 of 2)