Key point: *Writing a program involves designing a strategy for solving the problem then using a programming language to implement that strategy.*

2.2 Writing a Simple Program

- Problem: Compute the area of a circle
- Solution: Design an *algorithm* for computing the area of a circle.
- An algorithm is a sequence of steps that solve a problem.
- Algorithm for computing the area of a circle:
    1. Read in the circle's radius
    2. Compute the area using the formula: $area = radius \times radius \times \pi$
    3. Display the result.

```
public class ComputeArea {
    public static void main(String[] args) {
        // Step 1 Read in radius

        //Step 2 Compute area

        //Step 3 Display the area
    }
}
```

- Use descriptive names for variables. In this case **radius** and **area**.
- Variables can store values of a certain type. In this case, we want our variables to store real numbers. In Java, the type that most closely resembles real is **double**.

```
public class ComputeArea {
    public static void main(String[] args) {
        double radius;
        double area;

        // Step 1 Read in radius

        //Step 2 Compute area

        //Step 3 Display the area
    }
}
```

Listing 2.1 ComputeArea.java

```
1   public class ComputeArea {
2       public static void main(String[] args) {
3           double radius;
4           double area;
5
6           // Assign a radius
7           radius = 20;                // radius is now 20
8
9           // Compute area
10          area = radius * radius * 3.14159;
11
12          Display results
13          System.out.println("The area for the circle of radius " +
14              radius + " is " + area);
15      }
16  }
```

```
run:
The area for the circle of radius 20.0 is 1256.636
BUILD SUCCESSFUL (total time: 0 seconds)
```

Figure 13.1 Output for the program given by Listing 2.1

2.2.1 Identify and fix the errors in the following code:

```
1   public class Test {
2       public void main(string[] args) {
3           double i = 50.0;
4           double k = i + 50.0;
5           double j = k + 1;
6
7           System.out.println("j is " + j + " and
8               k is " +  k);
9       }
10  }
```