3 Fundamental Data Types of Jav a

3.1

```
1  import CSLib.*;
2
3  public class EchoThreeIntegers {
4
5    // Read three integers and print in reverse
6    // Author:  Reed Tripp, April 13, 2001
7
8    public void echo () {
9      InputBox in;
10     OutputBox out;
11     int i;
12     int j;
13     int k;
14
15     in = new InputBox();
16     in.setPrompt("Enter an integer:");
17     i = in.readInt();
18     in.setPrompt("Enter another integer:");
19     j = in.readInt();
20     in.setPrompt("Enter yet another integer:");
21     k = in.readInt();
22     out = new OutputBox();
23     out.print("The integers you entered were ");
24     out.print(k);
```

```
25        out.print(", ");
26        out.print(j);
27        out.print(" and ");
28        out.print(i);
29        out.println(".");
30      }
31    }
```

3.2

```
1   import CSLib.*;
2
3   public class DrawCircleClient {
4     public static void main (String[] args) {
5       DrawCircle dc;
6       dc = new DrawCircle();
7       dc.draw();
8     }
9   }
```

3.3

With x=4, y=5, and z=6,

```
x+(y+z)*x+y*z=78
x+y+z*(x+y)*z=333
x+y+z*(x+y*z)=213
```

3.4

Omitting line 13 from the concentric circles program produces:

```
Concentric.java:13: variable coord might not have been initialized
    g.drawOval(coord, coord, diam, diam);
               ^
Concentric.java:13: variable diam might not have been initialized
    g.drawOval(coord, coord, diam, diam);
                             ^
2 errors
```

3.5

Replacing the two lines

```
InputBox in;
int i;
```

by the single declaration

```
InputBox in, i;
```

is wrong, because it would change the type of variable `i` from `int` to `InputBox`.

3.6

-6543210.0	is written	`-6.54321e6`
$.897654321$	is written	`8.97654321e-1`
3×10^{45}	is written	`3.0e45`
0.000061	is written	`6.1e-5`
45.8×10^{-3}	is written	`4.5e-2`

3.7

```
1  import CSLib.*;
2
3  public class Temperature {
4    //  Convert temperature from Centigrade to Fahrenheit
5    //  Author: Dee Gries, February 2, 2001
6
7    public void compute () {
8      double temperature;  // The Centigrade temperature.
9      InputBox in;
10     OutputBox out;
11
12     in = new InputBox();
13     in.setPrompt ("Please type the temperature (deg C): ");
14     temperature = in.readDouble();
15
16     out = new OutputBox();
17     out.print(temperature);
18     out.print(" deg C is ");
19     out.print((temperature * (9.0 / 5.0) + 32.0));
20     out.println(" deg F");
21   }
22 }
```

3.8

```
1  import CSLib.*;
2
3  public class Temperature {
4    //  Convert temperature from Fahrenheit to Centigrade and kelvins
5    //  Author: Z. Rhocold, January 1, 2001
6
7    public void compute () {
8      double temperature;  // The Fahrenheit temperature.
9      InputBox in;
10     OutputBox out;
11
12     in = new InputBox();
13     in.setPrompt ("Please type the temperature (deg F): ");
14     temperature = in.readDouble();
15
```

```
16        out = new OutputBox();
17        out.print(temperature);
18        out.print(" deg F is ");
19        out.print((5.0 * (temperature - 32.0)) / 9.0);
20        out.print(" deg C and ");
21        out.print((temperature - 32.0) * (5.0 / 9.0) + 273.16);
22        out.println(" kelvins.");
23      }
24    }
```

3.9

`out.println(s1.length()/2);` prints 10.

`out.println(s1.substring(0,s1.length()-1));` prints `Here's another test` (without the period).

`out.println(s1.indexOf("e'x"));` prints -1.

3.10

`out.println(s1.substring(1,100));` String `s1` has no position 99.

`out.println(s1.substring(6,2));` Position 6 does not precede position 2.

3.11

```
1   import CSLib.*;
2
3   public class Pick {
4     // Read a string and a position, and tell which character
5     // is at that position.
6     // Author:  Geta Char, October 23, 2001
7
8     public void readAndPick () {
9       InputBox in = new InputBox();
10      OutputBox out = new OutputBox();
11      in.setPrompt("Enter a string:");
12      String s = in.readString();
13      in.setPrompt("Enter an integer:");
14      int pos = in.readInt();
15      out.print(s.charAt(pos));
16    }
17  }
```

This program tells which character of a string is at a given position. Both the string and the position are supplied by user input.

3.12

`out.println("4"+"0 05");` The string `"4"` is concatenated to the string `"005"`, resulting in the string `"4005"`.

`out.println("4"+00 5)` ;The integer `005`, which is the same as `5`, is converted to the string `"5"`, which is then concatenated to `"4"`, resulting in the string `"45"`.

`out.println(1+2+"4 ")` ;The integers `1` and `2` are summed to produce the integer `3`, which is then converted to the string`"3"`, which is then concatenated to the string `"4"`, resulting in the string `"34"`.

`out.println(1+(2+" 4"));` The integer `2` is converted to the string`"2"`, which is then concatenated to the string `"4"`, resulting in the string `"24"`; then the in teger1 is converted to the string`"1"`, which is then concatenated to the string `"24"`, resulting in the string `"124"`.

`out.println("4"*5)` ; This statement produces an error, since the operator `*` cannot be applied to a string.