

**Question J5–1:** (Solution, p 4)

Complete the program at right so that it reads a number  $n$  from the user and displays the  $n$ th **harmonic number**. (The  $n$ th harmonic number is the sum of the reciprocals of the integers up to  $n$ :  $1/1 + 1/2 + 1/3 + 1/4 + \dots + 1/n$ .)

I should see the following were I to run your program and enter the number 2.

```
n? 2
1.5
```

```
import csbsju.cs150.*;

public class Harmonic {
    public static void run() {
        IOWindow io = new IOWindow();

    }
}
```

**Question J5–2:** (Solution, p 4)

Complete the program at right so that when run, it repeatedly reads integers from the user until the user enters 0. Then it should print the sum of the user's integers.

For example, if a user ran your program and entered 10, 2, 4, and 0, the user should see the following.

```
Number? 10
Number? 2
Number? 4
Number? 0
16
```

```
import csbsju.cs150.*;

public class PrintSum {
    public static void run() {
        IOWindow io = new IOWindow();

    }
}
```

**Question J5–3:** (Solution, p 4)

Complete the program at right so that when run, it reads a line from the user and displays how many letters precede the first lower-case  $a$  in the string. (Your program may assume that the user types a line containing an  $a$ .)

For example, a user typing the program should see the following, assuming the user types what is in boldface.

```
? This is a test.
8
```

In this example, the program displays “8” because the user's string contains eight letters before the letter  $a$ .

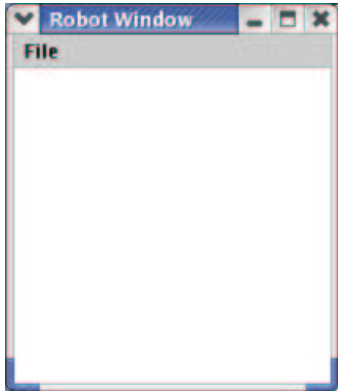
```
import csbsju.cs150.*;

public class FindFirstA {
    public static void run() {
        IOWindow io = new IOWindow();

    }
}
```

**Question J6-1:** (Solution, p 5)

Suppose a user runs the Java program at right. When the program ended, how would its window appear?



```
import csbsju.cs150.*;

public class Mystery {
    public static void run() {
        RobotWindow win = new RobotWindow();
        win.show();
        Robot rob = new Robot(win, 50, 50);
        rob.turn(45);
        int drawn = 0;
        while(drawn < 7) {
            rob.move(20);
            if(drawn % 2 == 0) {
                rob.turn(-90);
            } else {
                rob.turn(90);
            }
            drawn++;
        }
        rob.switchOff();
    }
}
```

**Question J6-2:** (Solution, p 5)

Complete the program at right so that it reads a sequence of numbers ending in -1, whereupon it prints the number of even numbers typed.

I should see the following were I to run your program and enter the numbers 2, 77, -34, 104, and -1.

```
Number? 2
Number? 77
Number? -34
Number? 104
Number? -1
3
```

```
import csbsju.cs150.*;

public class CountEvens {
    public static void run() {
        IOWindow io = new IOWindow();

    }
}
```

**Question J7-1:** (Solution, p 5)

Suppose we run the program at right and see the following. (Boldface indicates what the user types.)

**: 1**  
**: 3**  
**: 2**  
**: 4**  
**: 0**

What does the program print now?

```
import csbsju.cs150.*;

public class Mystery {
    public static void run() {
        IOWindow io = new IOWindow();
        int[] a = new int[5];
        int i = 0;
        while(i < 5) {
            io.print(": ");
            a[io.readInt()] = i;
            i++;
        }
        i = 4;
        while(i >= 0) {
            io.print(a[i]);
            i--;
        }
    }
}
```

**Solution J5-1:** (Question, p 1)

```
import csbsju.cs150.*;

public class Harmonic {
    public static void run() {
        IOWindow io = new IOWindow();
        io.print("n? ");
        int n = io.readInt();
        double harm = 0.0;
        while(n > 0) {
            harm += 1.0 / n;
            n--;
        }
        io.println(harm);
    }
}
```

**Solution J5-2:** (Question, p 1)

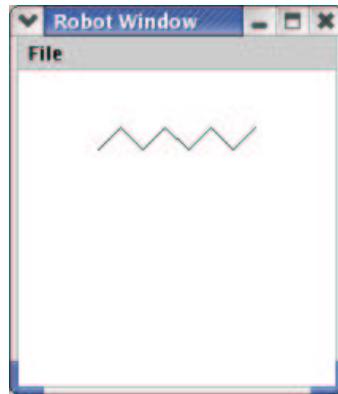
```
import csbsju.cs150.*;

public class PrintSum {
    public static void run() {
        IOWindow io = new IOWindow();
        io.print("Number? ");
        int num = io.readInt();
        int sum = 0;
        while(num != 0) {
            sum += num;
            io.print("Number? ");
            int num = io.readInt();
        }
        io.println(sum);
    }
}
```

**Solution J5-3:** (Question, p 1)

```
import csbsju.cs150.*;

public class FindFirstA {
    public static void run() {
        IOWindow io = new IOWindow();
        io.print("? ");
        String line = io.readLine();
        int index = 0;
        while(!(line.substring(index, index + 1)).equals("a")) {
            index++;
        }
        io.println(index);
    }
}
```

**Solution J6-1:** (Question, p 2)**Solution J6-2:** (Question, p 2)

```
import csbsju.cs150.*;

public class CountEvens {
    public static void run() {
        IOWindow io = new IOWindow();
        io.print("Number? ");
        int num = io.readInt();
        int count = 0;
        while(num != -1) {
            if(num % 2 == 0) {
                count++;
            }
            io.print("Number? ");
            num = io.readInt();
        }
        io.println(count);
    }
}
```

**Solution J7-1:** (Question, p 3) 31204