

Chapter three

Introduction to objects and input/output

Answer the following question

Q1-

```
Public class Ch3_PrExxercise
{
    Public static void main (String[] args)
    {
        . . .
    }
}
```

- a. Write Java statements that import the **classes** **Scanner**, **FileReader**, and **PrintWriter** from the **packages** **java.util** and **java.io**.
- b. Write statements that declare **inFile** to be a reference variable of type **Scanner** and **outFile** to be a reference variable of type **PrintWriter**.
- c. The program will read data from the file **inData.txt** and write output to the file **outData.dat**. Write statements to open both these files, associate **inFile** with **inData.txt**, and associate **outFile** with **outData.dat**.
- d. Suppose that the file **inData.txt** contains the following data:

| | |
|-------|---------|
| 10.20 | 5.35 |
| 15.6 | |
| Randy | Gill 31 |
| 18500 | 3.5 |
| A | |

The numbers in the first line represent the length and width, respectively, of a rectangle. The number in the second line represents the radius of a circle. The third line contains the first name, last name, and the age of a person. The first number in the fourth line is the savings account balance at the beginning of the month and the second number is the interest rate per year. (Assume that p ¼

3.1416.) The fifth line contains an uppercase letter between A and Y (inclusive). Write statements so that after the program executes, the contents of the file **outData.txt** are as shown below. If necessary, declare additional variables. Your statements should be general enough so that if the content of the input file changes and the program is run again (without editing and recompiling), it outputs the appropriate results.

| |
|--|
| Rectangle: Length = 10.20, width = 5.35, area = 54.57, parameter = 31.10 |
| Circle: Radius = 15.60, area = 764.54, circumference = 98.02 |
| Name: Randy Gill, age: 31 Beginning balance = \$18500.00, interest rate = 3.50 Balance at the end of the month = \$18553.96 |
| The character that comes after A in the ASCII set is B |

- e. Write the statement that closes the output file.
- f. Write a Java application program that tests the Java statements that you wrote in parts a–e.

Answer

Answer

Q.2:

Write a program that prompts the user to enter the weight of a person in kilograms and outputs the equivalent weight in pounds. Output both the weights rounded to two decimal places. (Note that 1 kilogram $\frac{1}{4}$ 2.2 pounds.) Format your output with two decimal places.

Q.3:

Three employees in a company are up for a special pay increase.

You are given a file, say Ch3_Ex7Data.txt, with the following data:

```
Miller Andrew  
65789.87 5 Green  
Sheila 75892.56 6  
Sethi Amit 74900.50  
6.1
```

Each input line consists of an employee's last name, first name, current salary, and percent pay increase. For example, in the first input line, the last name of the employee is Miller, the first name is Andrew, the current salary is 65789.87, and the pay increase is 5%. Write a program that reads data from the specified file and stores the output in the file Ch3_Ex7Output.dat. For each employee, the data must be output in the following form: firstName lastName updatedSalary. Format the output of decimal numbers to two decimal places.

Answer

Chapter Four

Control structures I: selection

Answer the following question

Q.1:

Write a program that prompts the user to input a number. The program should then output the number and a message saying whether the number is positive, negative, or zero.

Q.2:

**Write a program that prompts the user to input three numbers.
The program should then output the numbers in non - descending
order.**

Q.3:

Write a program that prompts the user to input an integer between 0 and 35. If the number is less than or equal to 9, the program should output the number; otherwise, it should output A for 10, B for 11, C for 12, ..., and Z for 35. (Hint: Use the cast operator, `(char)()`, for numbers ≥ 10 .)

Q.4:

Write a program that mimics a calculator. The program should take as input two integers and an arithmetic operation (+, -, *, or /) to be performed. It should then output the numbers, the operator, and the result. (For division, if the denominator is zero, output an appropriate message.) Some sample outputs follow:

$$3 + 4 = 7$$

$$13 * 5 = 65$$

Q.5:

One way to determine how healthy a person is by measuring the body fat of the person. The formulas to determine the body fat for female and male are as follows:

Body fat formula for women:

$A1 \frac{1}{4} (\text{Body weight } 0.732) + 8.987$

$A2 \frac{1}{4} \text{ Wrist measurement (at fullest point)} / 3.140$ $A3 \frac{1}{4}$

$\text{Waist measurement (at navel)} 0.157$

$A4 \frac{1}{4} \text{ Hip measurement (at fullest point)} 0.249$

$A5 \frac{1}{4} \text{ Forearm measurement (at fullest point)} 0.434$ $B \frac{1}{4} A1 +$

$A2 - A3 - A4 + A5$

Body fat $\frac{1}{4}$ body weight – B

Body fat percentage $\frac{1}{4}$ body fat $100 / \text{body weight}$ Body fat formula for men:

$A1 \frac{1}{4} (\text{Body weight } 1.082) + 94.42$ $A2 \frac{1}{4} \text{ Waist measurement } 4.15$

$B \frac{1}{4} A1 - A2$

Body fat $\frac{1}{4}$ body weight – B

Body fat percentage $\frac{1}{4}$ body fat $100 / \text{body weight}$ write a program to calculate the body fat of a person.

Answer

Chapter five

Control Structures II: Repetition

Q1: Mark the following statements as true or false:

| | |
|---|--|
| 1. In a counter-controlled while loop, it is not necessary to initialize the loop control variable. | |
| 2. It is possible that the body of a while loop might not execute at all | |
| 3. In an infinite while loop, the loop condition is initially false, but after the first iteration, it is always true. | |
| 4. The while loop: j = 0; while (j <= 10) j++; terminates when j > 10. | |
| 5. A sentinel-controlled while loop is an event-controlled while loop whose termination depends on a special value. | |
| 6. A loop is a control structure that causes certain statements to execute over and over | |
| 7. To read data from a file of an unspecified length, an EOF-controlled loop is a good choice | |
| 8. When a while loop terminates, the control first goes back to the statement just before the while statement, and then the control goes to the statement immediately following the while loop. | |

Q2 — What is the output of the following Java code?

```
count = 1;  
y = 100;  
while (count < 10)  
{  
    y = y - 1;  
    count++;  
}  
System.out.println("y = " + y + " and count = " + count);
```

Q3 – What is the output of the following Java code? Assume all variables are properly declared.

```
sum = console.nextInt();  
num = console.nextInt();  
for (j = 1; j <= 3; j++)  
{  
    num = console.nextInt();  
    sum = sum + num;  
}  
System.out.println("Sum = " + sum);
```

Q4- Suppose that the input is:

38 35 71 14 -1

What is the output of the following code? Assume all variables are properly declared.

```
sum = console.nextInt();  
num = console.nextInt();  
while (num != -1)  
{  
    sum = sum + num;  
    num = console.nextInt();  
}  
System.out.println("Sum = " + sum);
```

Q5- Consider the following for loop:

```
int j, s;  
s = 0;  
for (j = 1; j <= 10; j++)  
s = s + j * (j - 1);
```

In this for loop, identify the loop control variable, the initialization statement, loop condition, the update statement, and the statement that updates the value of s.

Q6- Given that the following code is correctly inserted into a program, state its entire output as to content and form:

```
num = 0;
for (i = 1; i <= 4; i++)
{
    num = num + 10 * (i - 1);
    System.out.print(num + " ");
}
System.out.println();
```

Q7- Assume that the following code is correctly inserted into a program:

```
s = 0;  
for (i = 0; i < 5; i++)  
{  
s = 2 * s + i;  
System.out.print(s + " ");  
}  
System.out.println();
```

- a. What is the final value of s?**
 - i. 11 ii. 4 iii. 26 iv. none of these**
- b. If a semicolon is inserted after the right parenthesis in the for loop control expressions, what is the final value of s?**
 - i. 0 ii. 1 iii. 2 iv. 5 v. none of these**
- c. If the 5 is replaced with a 0 in the for loop control expression, what is the final value of s?**
 - i. 0 ii. 1 iii. 2 iv. none of these**

Q8- What is the output of the following program?

```
Public class Mystery
{
Public static void main(String[] args)
{
int x, y, z;
x = 4;
y = 5;
z = y + 6;
do
{
System.out.print(z + " ");
z = z + 7;
}
While (((z - x) % 4) != 0);
System.out.println();
}
}
```


Q9- What is the output of the following program segment?

```
int count = 1;  
do  
System.out.print((count * (count - 2)) + " ");  
while (count++ <= 5);  
System.out.println();
```

Q10-What is the output of the following code?

```
int num = 12;
while (num >= 0)
{
    if (num % 5 == 0)
        break;
    System.out.print(num + " ");
    num = num - 2;
}
System.out.println();
```

Q11- What is the output of the following code?

```
int num = 12;
while (num >= 0)
{
    if (num % 5 == 0)
    {
        num++;
        continue;
    }
    System.out.print(num + " ");
    num = num - 2;
}
System.out.println();
```

Q12- Write a for statement to add all multiples of 3 between 1 and 100.

Q13-(Count positive and negative numbers and compute the average of numbers)

Write a program that reads an unspecified number of integers, determines how many positive and negative values have been read, and computes the total and average of the input values (not counting zeros). Your program ends with the input 0. Display the average as a floating-point number. Here is a sample run:

```
Enter an integer, the input ends if it is 0: 1 2 -1 3 0 ↵Enter
The number of positives is 3
The number of negatives is 1
The total is 5.0
The average is 1.25
```

```
Enter an integer, the input ends if it is 0: 0 ↵Enter
No numbers are entered except 0
```

Q14- (*Conversion from kilograms to pounds*) Write a program that displays the following table (note that 1 kilogram is 2.2 pounds):

| Kilograms | Pounds |
|-----------|--------|
| 1 | 2.2 |
| 3 | 6.6 |
| ... | |
| 197 | 433.4 |
| 199 | 437.8 |

Q15- (Find numbers divisible by 5 or 6, but not both) Write a program that displays all the numbers from 100 to 200, ten per line, that are divisible by 5 or 6, but not both. Numbers are separated by exactly one space.

Q16-Write a java program to compute the average and the standard deviation of the first 10 integer numbers.

Q17 write a java program to compute the following formula $S = \sum_{n=1}^N \frac{n+7}{n^2+5}$

Q18 write a java program to compute summation of the first N odd numbers.

Q19 write a java program to compute the roots of the equation $ax^2+bx+c=0$