

Problem1) from the Deitel & Deitel (ch4, 4.15)

Identify and correct the errors in each of the following pieces of code. [Note: There may be more than one error in each piece of code.]

```
b) int x = 1, total;
    while ( x <= 10 )
    {
        total += x;
        ++x;
    }

c) while(x<=100)
    total += x;
    ++x;

d) while ( y > 0 )
    {
        System.out.println( y );
        ++y;
```

Problem2) from the Deitel & Deitel (ch4, 4.21)

The process of finding the largest value is used frequently in computer applications. For example, a program that determines the winner of a sales contest would input the number of units sold by each salesperson. The salesperson who sells the most units wins the contest. Write a pseudo code program, then a Java application that inputs a series of 10 integers and determines and prints the largest integer. Your program should use at least the following three variables:

- a) counter: A counter to count to 10 (i.e., to keep track of how many numbers have been input and to determine when all 10 numbers have been processed).
- b) number: The integer most recently input by the user.
- c) largest: The largest number found so far.

Problem3) from the Deitel & Deitel (ch4, 4.25)

What does the following program print?

```
public class Mystery2
{
    public static void main(String[] args)
    {
        int count = 1;
        while ( count <= 10 )
        {
            System.out.println( count % 2 == 1 ? "*****" : "+++++++" );
            ++count;
        }
    }
}
```

Problem4) from the Deitel & Deitel (ch4, 4.26)

What does the following program print?

```
public class Mystery3
{
    public static void main(String[] args)
    {
        int row = 10;
        int column;

        while ( row >= 1 )
        {
            column = 1;
            while ( column <= 10 )
            {
                System.out.print( row % 2 == 1 ? "<" : ">" );
                ++column;
            }
            --row;
            System.out.println();
        }
    }
}
```

Problem5) from the Deitel & Deitel (ch4, 4.29)

Write an application that prompts the user to enter the size of the side of a square, and then displays a hollow square of that size made of asterisks. Your program should work for squares of all side lengths between 1 and 20.

Problem6) from the Deitel & Deitel (ch4, 4.30)

A palindrome is a sequence of characters that reads the same backward as forward. For example, each of the following five-digit integers is a palindrome: 12321, 55555, 45554 and 11611. Write an application that reads in a five-digit integer and determines whether it's a palindrome. If the number is not five digits long, display an error message and allow the user to enter a new value.

Problem7) from the Deitel & Deitel (ch4, 4.31)

Write an application that inputs an integer containing only 0s and 1s (i.e., a binary integer) and prints its decimal equivalent. [Hint: Use the remainder and division operators to pick off the binary number's digits one at a time, from right to left. In the decimal number system, the rightmost digit has a positional value of 1 and the next digit to the left a positional value of 10, then 100, then 1000, and so on. The decimal number 234 can be interpreted as $4 * 1 + 3 * 10 + 2 * 100$. In the binary number system, the rightmost digit has a positional value of 1, the next digit to the left a positional value of 2, then 4, then 8, and so on. The decimal equivalent of binary 1101 is $1 * 1 + 0 * 2 + 1 * 4 + 1 * 8$, or $1 + 0 + 4 + 8$ or, 13.]

Problem8) from the Deitel & Deitel (ch4, 4.33)

Write an application that keeps displaying in the command window the multiples of the integer 2—namely, 2, 4, 8, 16, 32, 64, and so on. Your loop should not terminate (i.e., it should create an infinite loop). What happens when you run this program?

Problem9) from the Deitel & Deitel (ch4, 4.37)

The factorial of a nonnegative integer n is written as $n!$ (Pronounced “ n factorial”) and is defined as follows:

$$n! = n \cdot (n-1) \cdot (n-2) \cdot \dots \cdot 1 \quad (\text{for values of } n \text{ greater than or equal to } 1)$$

and

$$n! = 1 \quad (\text{for } n=0)$$

For example, $5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$, which is 120.

- a) Write an application that reads a nonnegative integer and computes and prints its factorial.
- b) Write an application that estimates the value of the mathematical constant e by using the following formula. Allow the user to enter the number of terms to calculate.

$$e = 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \dots$$

- c) Write an application that computes the value of e^x by using the following formula. Allow the user to enter the number of terms to calculate.

$$e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$$

Problem10) from the Deitel & Deitel (ch5, 5.9)

Find and correct the error(s) in each of the following segments of code:

a)

```
for(i=100,i>=1,i++)  
    System.out.println( i );
```

b) The following code should output the odd integers from 19 to 1:

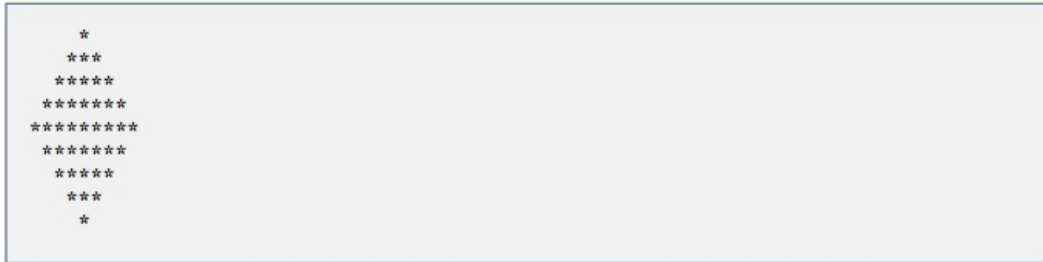
```
for ( i = 19; i >= 1; i += 2 )  
    System.out.println( i );
```

- c) The following code should output the even integers from 2 to 100:
- ```
counter = 2;

do
{
 System.out.println(counter);
 counter += 2;
}while(counter < 100);
```

**Problem11) from the Deitel & Deitel (ch5, 5.24)**

Write an application that prints the following diamond shape. You may use output statements that print a single asterisk (\*), a single space or a single new-line character. Maximize your use of repetition (with nested for statements), and minimize the number of output statements.

**Problem12) from the Deitel & Deitel (ch5, 5.27)**

What does the following program segment do?

```
for (i = 1; i <= 5; i++)
{
 for (j = 1; j <= 3; j++)
 {
 for (k = 1; k <= 4; k++) System.out.print('*');
 System.out.println();
 }
 System.out.println();
}
```