

### Problem1) from the Deitel & Deitel (ch5, 5.19)

Assume that  $i = 1$ ,  $j = 2$ ,  $k = 3$  and  $m = 2$ . What does each of the following statements print?

- a) `System.out.println( i == 1 );`
- b) `System.out.println( j == 3 );`
- c) `System.out.println((i>=1)&&(j<4));`
- d) `System.out.println( ( m <= 99 ) & ( k < m ) );`
- e) `System.out.println((j>=i) || (k==m));`
- f) `System.out.println((k+m<j) | (3-j>=k));`
- g) `System.out.println( !( k > m ) );`

### Problem2) from the Deitel & Deitel (ch5, 5.23)

De Morgan's laws can sometimes make it more convenient for us to express a logical expression. These laws state that the expression `!(condition1 && condition2)` is logically equivalent to the expression `!(condition1 || !condition2)`. Also, the expression `!(condition1 || condition2)` is logically equivalent to the expression `!(condition1 && !condition2)`. Use De Morgan's laws to write equivalent expressions for each of the following, and then write an application to show that both the original expression and the new expression in each case produce the same value:

- h) `!(x<5) && !(y>=7)`
- i) `!( a == b ) || !( g != 5 )`
- j) `!( ( x <= 8 ) && ( y > 4 ) )`
- k) `!( ( i > 4 ) || ( j <= 6 ) )`

### Problem3)

Write a Java program to ask the user to enter 3 integers, and then, display the smallest and the largest?

### Problem4)

Write a Java program to check if a number is even or odd. (i.e. the number is entered by the user and then the program displays the word "even" or "odd" accordingly).

### Problem5) from the Deitel & Deitel (ch2, 2.32)

Write a program that inputs five numbers and determines and prints the number of negative numbers input, the number of positive numbers input and the number of zeros input.

**Problem6) from the Deitel & Deitel (ch4, 4.28)**

Modify the given code to produce the output shown in each part of the problem. Use proper indentation techniques. Make no changes other than inserting braces and changing the indentation of the code. The compiler ignores indentation in a Java program. We've eliminated the indentation from the given code to make the problem more challenging. [Note: It's possible that no modification is necessary for some of the parts.]

```
if ( y == 8 )  
if ( x == 5 )  
System.out.println( "#####" );  
else  
System.out.println( "#####" );  
System.out.println( "#####" );  
System.out.println( "#####" );
```

a) Assuming that  $x = 5$  and  $y = 8$ , the following output is produced:

```
#####  
#####  
#####
```

b) Assuming that  $x = 5$  and  $y = 8$ , the following output is produced:

```
#####
```

c) Assuming that  $x = 5$  and  $y = 8$ , the following output is produced:

```
#####
```

d) Assuming that  $x = 5$  and  $y = 7$ , the following output is produced. [Note: The last three output statements after the else are all part of a block.]

```
#####  
#####  
#####
```

**Problem7) 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.