

```
import org.json.JSONObject;
import java.text.SimpleDateFormat;
import java.util.ArrayList;
import java.util.Date;
import java.util.HashMap;
```

## Tutorial #4: Boolean Expressions & Selection Instructions - SOLUTIONS

### Question 1:

What output will be produced by the following code?

```
public class SelectionStatements
{
    public static void main(String[] args)
    {
        int number = 24;
        if (number % 2 == 0)
            System.out.print("The condition evaluated to true!");
        else
            System.out.print("The condition evaluated to false!");
    }
}
```

**Answer:**

The condition evaluated to true!

### Question 2:

What would be the output of the code in Question 1 be if number was originally initialized to 25?

**Answer:**

The condition evaluated to false!

### Question 3:

Write a series of if statement statements that evaluates a person's weight on the following criteria:

- A weight less than 116 pounds, output: Eat 5 banana splits!
- A weight between 116 pounds and 130 pounds, output: Eat a banana split!
- A weight between 131 pounds and 200 pounds, output: Perfect!
- A weight greater than 200 pounds, output: Plenty of banana splits have been consumed!

```
import org.json.JSONObject;
import java.text.SimpleDateFormat;
import java.util.ArrayList;
import java.util.Date;
import java.util.Scanner;
```

**Answer:**

```
import java.util.Scanner;
public class Question3 {
    public static void main(String[] args)
    {
        Scanner keyIn = new Scanner(System.in);
        int weight;

        System.out.print("What is your weight? ");
        weight = keyIn.nextInt();

        if (weight < 116)
            System.out.println("Eat 5 banana splits!");
        if (weight >= 116 && weight <= 130)
            System.out.println("Eat a banana split");
        if (weight <= 200 && weight >= 131)
            System.out.println("Perfect!");
        if (weight > 200)
            System.out.println("Plenty of banana splits have been consumed!");
    }
}
```

#### Question 4:

Write a series of if statement statements to compute the amount of shipping due on an online sale. If the cost of the purchase is less than or equal to \$20, the shipping cost is \$5.99. If the cost of the purchase is over \$20 and at most \$65, the shipping cost is \$10.99. If the cost of the purchase is over \$65, the shipping cost is \$15.99.

**Answer:**

```
if (cost_of_purchase <= 20)
    shipping_cost = 5.99;
if (cost_of_purchase > 20 && cost_of_purchase <= 65)
    shipping_cost = 10.99;
if (cost_of_purchase > 65)
    shipping_cost = 15.99;
System.out.print("shipping cost is "+ shipping_cost);
```

```
import org.json.JSONObject;
import java.text.SimpleDateFormat;
import java.util.ArrayList;
import java.util.Date;
import java.util.HashMap;
```

**Question 5:**

What is the value of these expressions?

```
1+2 > 4-2 && 12 < 23  Answer: true
1+2 > 4-2 || 12 < 23  Answer: true
1+2 > 4-2 && 12 > 23  Answer: false
1+2 > 4-2 || 12 > 23  Answer: true
```

**Question 6:**

What is the output of these code fragments?

```
int sum = 14;
if (sum < 20)
    System.out.print("Under ");
else
    System.out.print("Over ");
System.out.println("the limit.");
```

**Answer:**  
Under the limit.

```
//-----
int sum = 14;
if (sum < 20)
    System.out.print("Under ");
else
{
    System.out.print("Over ");
    System.out.println("the limit.");
}
//-----
```

**Answer:**  
Under

```
int sum = 94;
if (sum < 20)
{
    System.out.print("Under ");
    System.out.println("the limit.");
}
else
{
    System.out.print("Over ");
    System.out.println("the limit.");
}
```

**Answer:**  
Over the limit.

```
import org.json.JSONObject;
import java.text.SimpleDateFormat;
import java.util.ArrayList;
import java.util.Date;
import java.util.HashMap;
```

**Question 7:**

Assume the following declarations:

```
int x = 1;
boolean isFree = false;
char initial = 'L';
char code = 'Y';
String english = "hi";

String italian = "ciao";
boolean q = (5 == 6);
```

For each of the following expressions, indicate if it creates a syntax error or not. If there is no error, indicate the value of the expression.

`(true && (5 > 6))`

**Answer:** Expression value is *false* since `(true && (5 > 6))` → `(true && (false))` → *false*

`((x != 0) || (x % 2 == 1))`

**Answer:** Expression value is *true* since `((x!=0)||(x%2 == 1))` → `((1!=0)||(1%2 == 1))` → `((true) || (1 == 1))` → *true*

`(isFree | (x < 0))`

**Answer:** Expression value is *false* since `(isFree | (x<0))` → `(false | (1 < 0))` → `(false | false)` → *false*

`initial == code`

**Answer:** Expression value is *false* since `initial == code` → `'L' == 'Y'` → *false*

`!!q`

**Answer:** Expression value is *false* since `!!q` → `!!false` → *!true* → *false*

```
import org.json.JSONObject;
import java.text.SimpleDateFormat;
import java.util.ArrayList;
import java.util.Date;
import java.util.HashMap;
```

```
(0 <= x <= 10)
```

**Answer:** Syntax error. It should be `(0 <= x && x <= 10)` and the value is true

```
(english > italian)
```

**Answer:** Syntax error. We can't use `>` operator with variables of type `String`. Need to use `String` method `compareTo()`.

```
initial = code
```

**Answer:** Initial value is `'L'` and after this statement, the value of `initial` will be changed to `'Y'` (the value of `code`)

```
"italian".equals(italian)
```

**Answer:** Expression value is false because we are comparing the string `"italian"` to the content of the variable `Italian` which contains `"ciao"`

### Question 8:

What is the output of the following?

```
int x = -555;
boolean isNegative = (x < 0);
if (isNegative)
{
    x = 100;
    if (isNegative)
        System.out.println("no");
    else
        System.out.println("yes");
}
else
    System.out.println("maybe");
```

**Answer:**  
no