

Montgomery College, CMSC 203
Worksheet 1
Module 6

Objectives

- Methods
- Passing arguments to methods
- Returning a value from a method

Warm-up Question – (Dialog Box and random numbers)

1. Which of the following properly uses a DialogBox?
 - a) `JOptionPane.showMessageDialog(String, "Hello World");`
 - b) `JOptionPane.showMessageDialog(null, "Hello World");`
 - c) `JOptionPane.System.out.println(null, "Hello World");`
 - d) `JOptionPane.showMessageDialog("Hello World", null);`
2. Write a java statement that will randomly generate an integer between 5 and 10?

Concept Questions

1) Methods are commonly used to:

- A) speed up the compilation of a program
- B) break a problem down into small manageable pieces
- C) emphasize certain parts of the logic
- D) document the program

2) Values that are sent into a method are called:

- A) variables
- B) arguments
- C) literals
- D) types

3) When an argument is passed to a method:

- A) its value is copied into the method's parameter variable
- B) its value may be changed within the called method
- C) values may not be passed to methods
- D) the method must not assign another value to the parameter that receives the argument

4) What is wrong with the following method call?

```
displayValue (double x);
```

- A) There is nothing wrong with the statement.
- B) displayValue will not accept a parameter.
- C) Do not include the data type in the method call.
- D) x should be a String.

5) Given the following method header, which of the method calls would be an error?

```
public void displayValues(int x, int y)
```

- A) displayValue(a,b); // where a is a short and b is a byte
- B) displayValue(a,b); // where a is an int and b is a byte
- C) displayValue(a,b); // where a is a short and b is a long
- D) They would all give an error.

6) Which of the following would be a valid method call for the following method?

```
public static void showProduct (int num1, double num2)
{
    int product;
    product = num1 * (int)num2;
    System.out.println("The product is " + product);
}
```

- A) showProduct(5.5, 4.0);
- B) showProduct(10.0, 4);
- C) showProduct(10, 4.5);
- D) showProduct(33.0, 55.0);

7) A special variable that holds a value being passed into a method is called what?

- A) Modifier
- B) Parameter
- C) Alias
- D) Argument

8) A parameter variable's scope is:

- A) the method in which the parameter is declared
- B) the class to which the method belongs
- C) the main method
- D) All of the above

9) The lifetime of a method's local variable is:

- A) the duration of the program
- B) the duration of the class to which the method belongs
- C) the duration of the method that called the local variable's method
- D) only while the method is executing

10) Local variables:

- A) are hidden from other methods
- B) may have the same name as local variables in other methods
- C) lose the values stored in them between calls to the method in which the variable is declared
- D) All of the above

11) Which of the following values can be passed to a method that has an `int` parameter variable?

- A) `float`
- B) `double`
- C) `long`
- D) All of the above
- E) None of the above

12) What will be returned from the following method?

```
public static double methodA()
{
    double a = 8.5 + 9.5;
    return a;
}
```

- A) 18.0
- B) 18 (as an integer)
- C) 8
- D) This is an error.

13) When a method tests an argument and returns a `true` or `false` value, it should return:

- A) a zero for `true` and a one for `false`
- B) a boolean value
- C) a zero for `false` and a non-zero for `true`
- D) a method should not be used for this type test

14) In the following code, `Integer.parseInt(str)`, is an example of:

```
int num;  
string str = "555";  
num = Integer.parseInt(str) + 5;
```

- A) a value-returning method
- B) a void method
- C) a local variable
- D) a complex method

15) Given the following method header, which of the method calls would be an error?

```
public void displayValues(double x, int y)
```

- A) `displayValue(a,b);` // where a is a long and b is a byte
- B) `displayValue(a,b);` // where a is an int and b is a byte
- C) `displayValue(a,b);` // where a is a short and b is a long
- D) They would all give an error.

16) Which of the following would be a valid method call for the following method?

```
public static void showProduct(double num1, int num2)  
{  
    double product;  
    product = num1 * num2;  
    System.out.println("The product is " +  
                        product);  
}
```

- A) `showProduct("5", "40");`
- B) `showProduct(10.0, 4.6);`
- C) `showProduct(10, 4.5);`
- D) `showProduct(3.3, 55);`

17) Java uses *pass by value* for passing parameters on a method call. What does this mean if the parameter is a primitive data type? What does this mean if the parameter is a reference to an object?

18) What is the output of the following code?

```
public class PassByValue {

    public static void main(String[] args) {
        int x = 1;
        int y = 2;

        modifyPrimitiveTypes(x,y);

        System.out.println(" x = " + x + " ; y = " + y );
    }
    private static void modifyPrimitiveTypes(int x, int y)
    {
        x = 5;
        y = 10;
    }
}
```

19) Following code represent a class Number: What is the output of the following code?

```
public class Number {
    private int value;

    public int getValue() {
        return value;
    }

    public void increaseValue(int n) {
        value += n;
    }
}
```

What is the output of the following code?

```
public class NumberDriver {

    public static void main(String[] args) {
        Number num1 = new Number();
        System.out.println(num1.getValue());
        passObject(num1, 5);
        System.out.println(num1.getValue());
    }
    public static void passObject(Number numObject, int n)
    {
        numObject.increaseValue(n);
    }
}
```

Programming Questions

- 1) Write the definition of a method `printGrade`, which has a `char` parameter and returns nothing. The method prints on a line by itself the message string `Grade :` followed by the `char` parameter (printed as a character) to standard output. Don't forget to put a new line character at the end of your line.

- 2) Given that a method receives three parameters `a`, `b`, `c`, of type `double`, write some code, to be included as part of the method, that determines whether the value of "`b squared`" - `4ac` is negative. If negative, the code prints out the message "`no real solutions`" and returns from the method.

- 3) Write a method `min` that has two `String` parameters and returns the smaller. Hint use the `compareTo` method of the `String` Class.

- 4) Write a method called `isPalindrome` that accepts a `String` as a parameter and returns `true` if the `String` is a palindrome, and `false` otherwise. You may assume that the entered `String` consists entirely of lowercase letters (meaning it contains no numbers, spaces, punctuation, etc). Hint: write code that creates a new string that is the original string reversed, and then check to see if the two strings are equal. Create a pseudo Code first for the body of the method.