

CS163/164 – Classes, Objects, Methods, Loops in Class Activity

Name(s): _____

1. Analyze the classes presented below to answer the following questions:
 - 1.1. Does the class MessagesAndMenu store any data/instance variables? Yes, an object of the type Scanner.
 - 1.2. What does the method MessagesAndMenu do? This is the constructor method and it initializes the attributes/data that the class stores.
 - 1.3. What does the method end do? Prints "Good bye!" in the terminal/console.
 - 1.4. What does the method menu do? Prints a menu of options, read and return an int number.
 - 1.5. What does the method read do? Prints "Enter a number: " in the terminal, reads an int number and returns it.
 - 1.6. What does the TestLoopMessages class do? Has a main method that creates a MessagesAndMenu object, call the menu method from that object, while the option is different than 0, call the specific method depending on some conditions.
 - 1.7. Where the MessagesAndMenu class is used? What is the name of the object created? It is used inside the main method on TestLoopMessages class. The name of the object is obj.
 - 1.8. What this line of code does: `int op = obj.menu();`? Call the method menu from the obj which is a MessagesAndMenu type of object.
2. Implement the method oddNumbers.
3. Implement the method exponentbyMultiplication.

```
import java.util.Scanner;
public class MessagesAndMenu {
    private Scanner scn;

    public MessagesAndMenu() {
        scn = new Scanner(System.in);
    }
    public void end() {
        System.out.println("Good bye!");
    }
    public int menu() {
        System.out.println("Choose one of those options:");
        System.out.println("(0) Exit");
        System.out.println("(1) Generate 100 first even numbers");
        System.out.println("(2) Generate 100 first odd numbers");
        System.out.println("(3) Exponent by Multiplication");
        System.out.println("Select your choice: ");
        return scn.nextInt();
    }
    public int read() {
        System.out.println("Enter a number: ");
        return scn.nextInt();
    }
}

public class TestLoopMessages {
    public static void main(String args[]) {
        MessagesAndMenu obj = new MessagesAndMenu();
        int op = obj.menu(); //1
        while(op != 0) { //condition
            if(op == 1) {
                String msg = evenNumbers();
                System.out.println(msg);
            }
            else if(op == 2) {
                //call oddNumbers method
            }
        }
    }
}
```

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```
        String msg2 = oddNumbers();
        System.out.println(msg2);
    }
    else{
        //call exponentByMultiplication method
        int base = obj.read();
        int exponent = obj.read();
        System.out.println(exponentByMultiplication(base, exponent));
    }
    op = obj.menu();
}
obj.end();
}
public static String evenNumbers(){
    String msg = "";
    for(int i = 0; i < 200; i+=2){
        msg += i + " ";
    }
    return msg;
}
/*
Method oddNumbers
Generates the 100 first odd numbers
@return String with the 100 first odd numbers
separated by a space
*/

public static String oddNumbers(){
    String msg = "";
    //generate the 100 first odd numbers
    for(int i = 1; i < 200; i+=2){
        msg += i + " ";
    }
    return msg;
}
/*
Method exponentByMultiplication
Calculates the exponent by doing multiplications
For example, when 2 is multiplied thrice by itself,
it is expressed as 2 × 2 × 2 = 8. Here, 2 is the base,
and 3 is the power or exponent.
@param base
@param exponent
@return a value which is the base in the power of exponent
*/
public static int exponentByMultiplication(int base, int exponent){
    //generates the base in the power of exponent
    //using multiplication
    int total = 1;
    for(int i = 0; i < exponent; i++){
        total = total * base;
    }
    return total;
}
}
```