Programming Fundamentals – Practice

1. What is the difference between while-loop and do-while-loop?

2. How do methods **isolate parts of a program**? Write a brief explanation.

3. Briefly explain what **argument**, in Java context is. Provide an example.

4. In a method definition, what is **return type**? Provide an example.

5. How are arrays passed to methods? How is the **different** from passing primary data types?

6. What are the curly braces **specifically** used for when working with arrays? Write an example.

7. Explain what binary search is. What important **pre-condition must an array meet**, so an item can be found in it with binary search?

8. To process all items in an array without knowing the exact index of each item, we use advanced type of loop. What kind of loop is it? Provide an example.

9. Write the name and a description of an operator that combines two Boolean values, with the following result:

Value 1	Value 2	Result
false	false	false
true	false	true
false	true	true
true	true	true

_____

_____

10. Which **Boolean operator** (write the name and the symbol!!!) produces the following results?
Note: Same operator is used for all comparisons!

25.0	?	25	true
20	?	17	false
7	?	11	true

_____

11. How many numbers will be printed in the console after executing the code below?
    a) one
    b) none
    c) there is an error in the code
    d) the code will keep printing indefinitely

```
int time = 59;
while (time<59){
  System.out.println(time);
  time = time - 1;
}
```

12. What result do you expect if you try to run the following code and the user enters 15?

a) You should be in school!
b) OK, you can stay.
c) nothing
d) error

```
int age;
System.out.println("How old are you? ");
age = keyboard.nextInt();
if (age<15)
  System.out.println("You should be in school!");
else if (age>15)
  System.out.println("OK, you can stay.");
```

13. Consider the code below:

```
for (int woof=1; woof <= 3; woof +=2){
  System.out.println("Dog");
  for (int meow=woof; meow >= 1; meow --)
    System.out.println("Cat");
}
```

How many times will "Dog" be printed? _____
How many times will "Cat" be printed? _____

Scratch pad

14. Fill out the memory trace for the following section of code:

```
int count = 5;
double money = 100;
do{
  count = count - 1;
  money = money/2;
  System.out.println(count + money);
} while (money>0 && count>0);
```

count	money	output

15. Will this method work, and what will it return if the following values are passed to it:

```
public static double convert(double value){
    double newValue;
    newValue = (value - 30)/2;
    return newValue;
}
```

a) 80 _____
b) 10.5 _____
c) -5 _____
d) None _____

16. Consider this method:

```
public static String _________(String str){
    String newStr = "";
    for (int pos=0; pos<str.length(); pos++){
        String nextChar = str.substring(pos,pos+1);
        if (! "AEIOUaeiou".contains(nextChar))
            newStr += nextChar;
    }
    return newStr;
}
```

a. Figure out what it does and write an appropriate name.

b. Write the result for **`newStr`** if **`str`** is given value **"What is happening to this String?"**

17. Consider this method:

```
static int multiply (int num1, int num2){
    int result = 2;
    for (int number = num1; number < num2; number++)
        result = result * number;
    return result;
}
static int multiply (int number){
    int result = multiply(2, number);
    return result;
}
```

Trace and write the final results for the following two calls:

a) `multiply(5,7);` _____

b) `multiply(4);` _____

a)

num1	num2	number	result

b)

num1	num2	number	result

18. Given the following code fragment: /A2

```
int [] list = {10, 9, 8, 7, 6, 5, 4};
for (int index = 1; index < list.length; index +=2)
    list[index] = list[index - 1];
```

Predict the content of the array, after the execution of the code:

19. Write a **section** of Java code that creates and populates an array with the 26 characters from the alphabet, from 'a' to 'z'.

20. Write a **section** of Java code that increments by one and prints each element from an existing int array, using for-each loop.

21. Write a method definition (**only the definition!**) for a method which calculates the hypotenuse given two sides of a right triangle.