OPMS 2018 – Exercise 2

Task 1 (Warm-Up) – Solutions

Determine the type and result of the following expressions!

1. false && true   false (bool)
2. !true   false (bool)
3. false && false   false (bool)
4. false && true || true   true (bool)
5. true && false == false   true (bool)
6. 20 / 3   6 (int)
7. 20 % 3   2 (int)
8. 20.0 / 3.0   6.666666666666667 (double)

Task 2 (Warm-Up) – Solutions

What do the following programs print on the console? **You are not allowed to use Eclipse during this task!**

a) Prints "first: 0"

```java
public class Task2a {
  public static void main(String[] args) {
      int first = 2;
      int second = 5;

      for (int i = 0; i < 2; i++) {
          first = second / first;
          second++;
          first = second * first;
      }
      System.out.println("first: " + first);
  }
}
```

b) Prints 4

```java
public class Task2b {
  public static void main(String[] args) {
      int a = 4;
      int b = 3;
      for (int i = 0; i <= a; i++){
          int n = 0;
          if (i == 2)
              break;
          b = i + b;
      }
      System.out.println(b);
  }
}
```

Task 3 (Basics) – Solutions

In the following task, you have to answer the given questions. You can note your answers on a piece of paper or in a text document. **You are not allowed to use Eclipse during this task!**

a) What is the return value of the following function given parameters a=9 and b=2?
   returns 4

```java
int function(int a, int b) {
    if (a < b)
        return a * b;
    else
        return a / b;
}
```

b) What is the return value of the following function given parameters a=9.0 and b=3?
   returns 1.0

```java
double function_2(double a, int b) {
    while (b > 1) {
        a = (int) (a / b);
        b--;
    }
    return a;
}
```

c) What is the return value of the following function given parameters a=3 and b=2?

returns 3

```
int function_3(int a, int b) {
    switch (a + b) {
    case 10:
        a = b;
    case 5:
        a = a * b;
    case 3:
        a = a / b;
        break;
    default:
        a = 0;
    }
    return a;
}
```

d) The following method (which checks if a given number is prime) contains one syntax error. What is the error and in which line is it?

Line 8: Because the method has the return type Boolean it has to be return true;

```
1    boolean is_primenumber(int n) {
2        if (n < 2)
3            return false;
4        for (int i = n / 2; i > 1; i--) {
5            if (n % i == 0)
6                return false;
7        }
8        return "Yes!";
9    }
```

e) What does the following method compute?

The method finds the minimal value stored within the given array x

```
int function(int[] x) {
    int y = x[0];
    for (int i = 1; i<x.length; i++) {
        if (x[i]<y){
            y=x[i];
        }
    }
    return y;
}
```

f) In what way do you have to augment the following method at the blank position so that the method computes if the given number is even?

x % 2

```java
boolean is_even(int x) {
    return ____ == 0;
}
```