Lab 1 - Exercises

1. **Right shift operator in java:**
   What is the result of the operation **`-1 >>> 63`** ? What about **`-1 >> 63`**?

2. **Bitwise operations in java:**
   Given two integers `op1` and `op2`, what is the result of
   `op1 & op2, op1 | op2, op1 ^ op2, ~op2.`
   Print the result in binary, decimal, and hexadecimal format

3. Write a method that can print an integer in the binary format
   (You should not use any method from **`Integer`** class)

4. **Primitive values and cast operator in java:**
   Given a **`byte b1 = (byte) 127;`** what is the binary representation of **`b1`**
   Hint: you can use the below statement
   ```
   String s1 = String.format("%8s", Integer.toBinaryString(b1 & 0xFF)).replace(' ', '0');
   ```
   What about **`byte b1 = (byte) 128;`** what is the binary representation of **`b1`**

5. Complete the implementation of **`Primes`** class from the lab

6. Print the first 10 **`Fibonacci numbers`** in class using iterations

   The **`Fibonacci sequence`** starts with two numbers 1 and 1 and the subsequent number is the sum of the previous two.
   Example: 1, 1, 2, 3, 5, 8, 13, 21, 34
   $F_0=1$, $F_1=1$ and $F_n = F_{n-1} + F_{n-2}$

7. Print the first 10 **`Fibonacci numbers`** in class using recursive calls

8. Calculate the greatest common divisor of two integer using recursion.

   The greatest common divisor (**`gcd`**) of two integers, which are not all zero, is the largest positive integer that divides each of the integers.
   Solution: Euclid's algorithm
   `gcd(a, 0) = a`
   `gcd(a, b) = gcd(b, a mod b)`