

AUIS ENGR 244 (Engineering Computing), Assignment 1

Deadline:¹ February 12, 2018; Tutorial discussion: February 26, 2018

- 1) Make yourself familiar with the modulo operator “%” and its meaning, i.e., evaluating the *remainder after division*. Write a program that takes two integer numbers x and y as user input and prints “valid” as output if and only if there is an integer number n such that $x = ny + 1$.
- 2) Make yourself familiar with the difference between division according to *integer arithmetics* and division according to *floating-point arithmetics*. What does the following code accomplish?

```
import java.util.Scanner;

public class ProblemTwo
{
    public static void main(String[ ] args)
    {
        Scanner stdin = new Scanner(System.in);
        System.out.print("Please specify x: ");
        int x = stdin.nextInt( );
        stdin.close( );
        System.out.println(x/8.0 - x/8);
    }
}
```

What output is displayed if the user gives the number 77 as input? What values can possibly occur as output?

- 3) Write a program which takes a natural number as user input and informs the user whether the input value is a prime number or not.
- 4) Write a program that determines the first 1000 prime numbers and prints them as output.
- 5) The sequence of Fibonacci numbers is defined by $F_0 = 0$, $F_1 = 1$, and $F_n = F_{n-1} + F_{n-2}$ for $n \geq 2$. Write a program that takes a natural number k as user input and gives the number F_k as output.

¹ Submissions (on paper only), as single work or done by groups of two people, can be handed in on Monday, Feb 12, at lecture time, or deposited in the mailbox (room B-F2-01) by Sunday, Feb 11. Each problem contributes one credit.