# EE101 C programming and SW engineering 1
# Lab Practice 5 – Looping

Use your preferred compiler to investigate the programming exercises below. This laboratory concerns the use of loops: **while**, **do while**, **for**; together with relational and logical operators and branching flow control statements **if**/**else** or **switch**.

## Exercise 1

Write two programs, first using a **while** loop and second using a **for** loop to print the numbers from 1 to 10 and their squares (See the example output below):

1 1
2 4
3 9
…
10 100

## Exercise 2

Write a program using two nested **for** loops (see you lecture 4 notes) to print the following triangle

*
**
***
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*****

Note: don't use multiple printf statements or one long printf statement, try to achieve it with loops.

## Exercise 3

Write a program to print the numbers between 1 and 10, along with an indication of whether the number is even or odd (see below):

1 is odd
2 is even
3 is odd

Hint: Use an **if**/**else** statement, which is controlled by determining if the number divided by 2 has a reminder (remember the % operator x%y = the remainder of x/y i.e. if x was 6 and y 4 then 6%4 = 2, the remainder of the division)

**Exercise 4**

Write a program to print the first 7 positive integers and their factorials. Compute the factorials inside a loop. Your programs output should look like:

The factorial of 1 is 1

The factorial of 2 is 1 * 2 = 2

The factorial of 3 is 1 * 2 * 3 = 6

The factorial of 4 is 1 * 2 * 3 * 4 = 24 etc…

**Exercise 5**

Write a program that take as an input a positive integer n and then compute the following sum:

$S = 1 + 1/2 + 1/3 + 1/4 + \ldots + 1/n$