TFL115 - Exercise 3

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1   Introduction

In this exercise there are assignments which should help you understand what
we covered in the lecture. This exercise is not mandatory and should not be
delivered, however it will help you manage the mandatory exercise which is
introduced later on. Please let us know if there are any problems with the
exercise or you feel unable to solve the tasks.

Feel free to use Github or Bitbucket when solving the tasks, but please do
use a private repository for the solutions.

Exercises marked with **(!)** might be a bit hard.

2   Import

- Create a file named `main.py`

- Create a file named `module.py`

- Create a function called `hello` in `module.py` which takes *one* positional argument called `name`. The function should return the string `"Hello, <name>"`.

  Hint: `"Per"+"Hans"` → `"PerHans"`

- Call the function `hello` from `main.py`, pass a reasonable argument.
  Hint: import.

3   Plot

A single plot should be produced (no subplot).

- Create a function named `power_of_two` which takes *one* numerical positional argument called `x`, the function should return x^2.

- The `x` values should range from -50 to 50. *Hint:* `list`, `range`, `for`.

- Calculate `y` values corresponding to the `x` values using the `power_of_two` function.

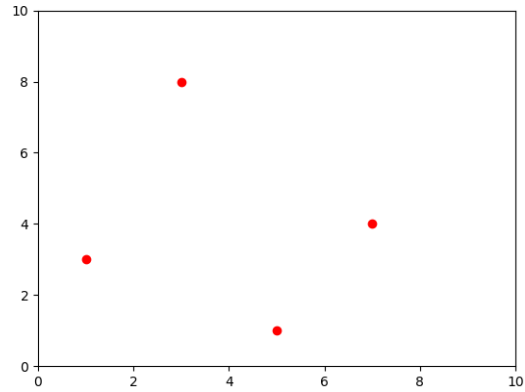- Plot the result with a green dotted line. *Hint:* `plot`.

Figure 1: Plot

4   Plot - Reverse engineering

Replicate the plot shown in Figure 1. *Hint:* `plot, axis`.

5   Max of Three

Create a function named `max_of_tree` which takes *three* (numerical) arguments and returns the largest one. Try to do this without using the build in `max` function. If two or more arguments are equal you can decide yourself what your function should do.

Hint: `if`

6   Fibonacci (!)

Each new term in the Fibonacci sequence is generated by adding the previous two terms. By starting with 1 and 2, the first 10 terms will be:

$1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...$

By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.

Hint 1: Start by making a function which generates a Fibonacci sequence up to a given limit. Keywords: `list, while`.
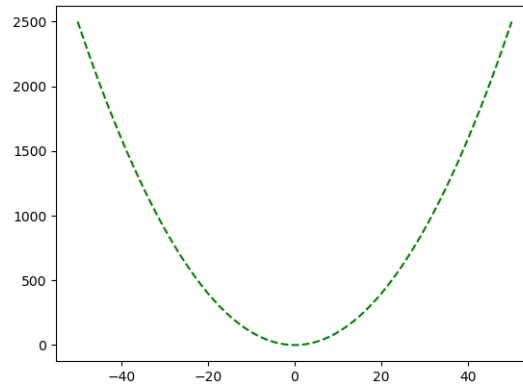
Hint 2: Modulo (%), `sum, for`.

Figure 2: Power of two

7 Solutions

7.1 Plot: See Figure 2

7.2 Fibonacci: 4613732