## Variables and arithmetic operators

Hints are using white fonts if you see the text Hint! And want to read the hint copy the text that is after it (can be multiple lines) and paste that into a text editor. Try it on the Hint! below

Hint! Good luck with the exercises!

### Declaring variables

Create a variable named car brand and assign the value “Volvo” to it.

### Printing

Create a variable named “name” and assign you full name to it. Print ‘Hello’ to the screen and then print the value of the variable “name” on a separate line.

**Expected output:**

Hello

Tim Nielsen

### Formatting output

Use the same code as in the last example but now use string formatting to create the output “Hello {name} have a great day!”

* When I request a specific format of the output that includes a variable. I will notate that by using {} for example “Hello {name}” would means that instead of {name} you should add the variable name to the output on that specific place.

**Expected output:**

Hello Tim Nielsen have a great day!

### Calculating the sum of static variables

Declare two variables with the values in Test Data and calculate the sum of them. Print the result to the console.

**Test Data:**

74

36

**Expected Output:**

110

### Calculating the sum of user input

Read two numbers from a user and calculate the sum of them. The printed output should include what numbers where given.

* Make you program user friendly if you expect the user to give input tell them what input that was. For example, “Enter number:” for inputs in this case. This applies to **all** programs that you ever will write
* Always test with more than the example data this applies to everything that you will ever write.

**Example data:**

74

36

**Example Output:**

The sum of 74 + 36 is 110

### Implement based on comments

Copy the content of comment\_exercises.txt to a new python file in your workspace. This file contains common comments that describe a set of tasks that needs to be completed to solve the problem of calculating how many years it takes until you turn one hundred

* Using comments to describe what will happen is a common way to plan what you need to do to solve a problem when programming.

Extending year calculator

Extend the previous solution so that the target age and actual age is read as inputs from the user instead. Format the output so it is apparent which was the target age for example. “It will be {years to target age} years until you are {target age} years old”

**Example data:**

Target age 500

Actual age 25

**Example output:**

It will be 475 years until you are 500 years old

### Calculate the area of a circle

Calculate the area of a circle where the user inputs the radius. Use the following formula Pi \* r^2 where Pi is the value 3.14 and r is the radius. Output the area and radius using the following format “Give the radius {user radius} the area of the circle is {area}”.

* If I were to break this problem down, I would land on these sub-problems:
  + Read a radius from the user
  + Calculate the area using 3.14 \* r^2
  + Output the area and radius.
* Add these sub-problems as comments in your solution. I recommend trying to break down all problems into sub-problems all exercise

**Example data:**

Radius 5

**Example output:**

Given the radius 5 the area of the circle is 78.5

### Swapping the value of two variables

Swap the value of two int variables. Print the start values and the swapped values.

* Remember that you cannot simply say x = y and vice versa as the old values will be overwritten
* Hint! You need more than two variables two solve this.

### Celsius to Fahrenheit

Convert Celsius to Fahrenheit where the user inputs the degrees in Celsius. The output should contain which Celsius was given and what that is in Fahrenheit.

* I will not give you any formula for this. Find it yourself

## Harder exercises

## Returning change

Write a program that calculates the best way for a cashier to give change when receiving payment. There will be two inputs from the user, the amount due and the amount of cash received. Assume the amount due is a non-floating number. Calculate the difference and then how many of each coin type they will receive. We will use the coin types 10, 5, 2, 1

* Hint! Start with the largest coin type
* Hint! After determining how many of a coin type should be returned remember to remove the value of those coins from the difference that should be returned as change. For example, if we should return 2 10, s we need to remove 20 from the amount that should be returned.

**Example data:**

Amount due 72

Cash received 100

**Example output:**

10’s = 2

5’s = 1

2’s = 1

1’s = 1