This practical assignment must be uploaded to eve.uj.ac.za **before** 2017-08-10 16h45. Late or incorrect submissions **will not be accepted**, and will therefore not be marked. You are **not allowed to collaborate** with any other student.

Good coding practices include a proper coding convention and a good use of commenting. Marks will be deducted if these are not present. See the reminder page for more details.

Previously we created a fixed size **perceptron**. We can further test and adjust the perceptron by changing the number of inputs and using a better activation function.
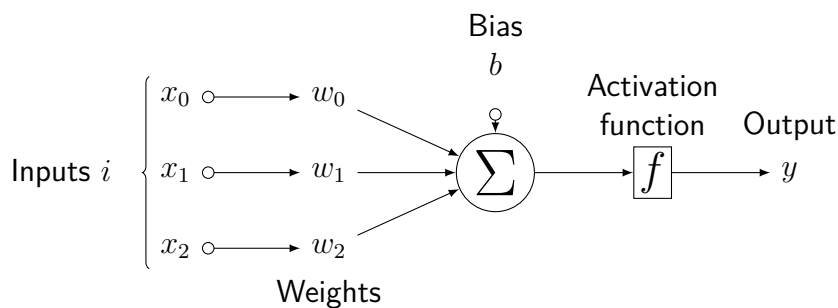


$$s = b + \sum_{n=0}^{i}(x_n * w_n)$$

$$y = \begin{cases} 0, & \text{if } s < a \\ s, & \text{otherwise} \end{cases}$$

Write an 80x86 assembly program that will calculate the output of a single perceptron. The program must ask the user for the number of inputs of the perceptron. After the user enters the number of inputs required the program will ask the user for each weight and each input (using a loop).

This process of asking the user for inputs and displaying outputs must continue until the user specifies that they are done. **Note**: Check the reminder page for submission details.

Test set1:

**number of inputs** $i$ - 3          **activation value** $a$ - 100

**bias** $b$ - 1          **expected output** $y$ - 0

| $x_0$ | 1 | $w_0$ | 15 |
|:---:|:---:|:---:|:---:|
| $x_1$ | 2 | $w_1$ | 10 |
| $x_2$ | 3 | $w_2$ | 5 |

Test set2:

**number of inputs** $i$ - 4          **activation value** $a$ - 50

**bias** $b$ - 3          **expected output** $y$ - 61

| $x_0$ | 1 | $w_0$ | 2 |
|:---:|:---:|:---:|:---:|
| $x_1$ | 2 | $w_1$ | 6 |
| $x_2$ | 3 | $w_2$ | 4 |
| $x_3$ | 4 | $w_2$ | 8 |

## Mark sheet

1. Design      [10]

2. Capture number of inputs      [05]

3. Loop for testing perceptron (calculation)      [15]

4. Display result      [05]

5. Exit condition      [05]

6. Structure and layout (no temporary variables, correct data types)      [05]

7. Commenting      [05]

8. Correct execution.      [15]

# NB

## Submissions which **do not assemble** will be capped at 40%!

Execution marks are awarded for a correctly functioning application and not for having some related code.

# Reminder

Your submission must follow the naming convention as set out in the general learning guide.
**Example**

| **Surname** | Berners-Lee | **Initials** | TJ |
|---|---|---|---|
| **Student number** | 209912345 | **Module Code** | CSC3B10 |
| **Current Year** | 2017 | **Practical number** | P02 |

`Berners-Lee_TJ_209912345_ CSC3B10_2017_P02`

Your submission must include the following in a single zip (compressed) file:

- *Source file* (`asm` file) - File containing your solution. Your details must be included at the top of the source code.
- *Program design* (`pdf` file) - File containing your design. Your details must be included at the top of the design.