Lab: Installing Theano
It is entirely possible that you are also working on another lab as a group. However, this lab (assignment) is to be done individually.

Due Day
This is included in Assignment 1, which will be due during Week 3. Please see myPlace for more details.

How to Submit
Each assignment (not a separate lab) should be submitted as a single PDF file. If it is more convenient, you can either insert a photograph of your handwritten solutions or type it on a computer using software of your choice. You can also include screenshots as needed.

Weight
This assignment is worth 2% of the coursework. Please keep in mind that the goal here is to have the software that you will need for our future labs.

Assessment Criteria
This lab will be assessed based on completion.

The Task:

We will be using Theano library intensively in our future labs and in class exercises. The current version is called Aesara. You can find more information at https://aesara.readthedocs.io/en/latest/ .

The goal of this lab is to make sure you have Theano (Aesara) available for you for our future labs. You have several options for this:

1) Use CIS labs in **Livingston Tower** where it is *already installed*.
2) Install it on your **own computer**.
3) Use CIS labs **Linux Guacamole** environment remotely.

Below, are more suggestions how each option can be accomplished. In this lab, you will be only asked to run the following testing lines:

```
import aesara as theano
a = theano.tensor.vector() # declare variable
out = a + a ** 10               # build symbolic expression
f = theano.function([a], out)   # compile function
print(f([0, 1, 2]))
```

You can put those lines into a text file with .py extension (e.g. test.py) and run it in PyCharm or from a command line. Alternatively, you can type “Python” in a command line and run the above lines one by one in an interactive Python interpreter. Either way, the output, should look like this:

```
[   0.    2. 1026.]
```

Depending on your particular configuration, at the beginning of your output, your may also see the following warning, which you can ignore:

```
WARNING (aesara.tensor.blas): Using NumPy C-API based implementation
for BLAS functions.
```

Livingston Tower CIS Labs

It is *already installed* in a separate environment in C:\Labs\aesara-dev. All you need is to set your PyCharm interpreter to use it. One possible way to do is the following:

Open your source file (e.g. test.py, from the above) with PyCharm (e.g. by clicking on it or by doing "File-Open" in PyCharm. I DO NOT recommend creating a project!). Click on the "Python" button in bottom right of your screen (It can be called "Python 3.8" or "Python 3.10" or similar depending on currently installed version) and select "Add Interpreter." Select "Existing Interpreter" and browse to python.exe in C:\Labs\aesara-dev.

Alternatively, you can choose "File - Settings - Project: Project Name - Python Interpreter", then click on the cog and choose "Add."

Make sure that you have configured your PyCharm to run the CORRECT source file by checking and changing it if needed in "Run -- Edit Configurations". "Script Path" should be set to your file (e.g. test.py). You can also verify there that your "Python Interpeter" is set correctly to C:\Labs\aesara-dev.

Similar sequence may be followed if you are using other Integrated Development Environments, e.g. Spyder, Visual Studio, etc.

Your Own Computer

Due to the variety of platforms and configurations used, we may not be able to make sure that it works on every student's computer. However, in the vast majority of cases, this can be accomplished by creating a new Anaconda environment with the following command:

```
conda create -n aesara-dev -c conda-forge aesara
```

You can find more details in https://aesara.readthedocs.io/en/latest/. Please note that you will not need GPU for our labs, since they are quick enough to run on a CPU. If you don't have Anaconda on your computer, you can download it for free from anaconda.com.

Linux Guacamole Environment

You can access CIS lab computers remotely using Linux at https://guacamole.cis.strath.ac.uk/ .

You can find PyCharm by typing it into "Activities" and clicking on the large PyCharm icon (not the smaller ones below it!). Click on "Open" and find the source file that you want to run. E.g., I can find S: drive by following the path "/home/xeb08186/drives/S" where xeb08186 is my DS login. Once you open your source file, you will need to change the selected Interpreter to the one already created for us by the support, which you will find at "/scratch/anaconda/aesara-dev/bin/python". The steps to accomplish that are the same as above under "Livingston Tower CIS Labs" option ("Add Interpreter", "Existing Interpreter", etc.) On Linux, the button (link) to set the Interpreter is at the bottom of the window and is called "Configure a Python interpreter".

What to Submit

Take a screenshot of the output mentioned above and add it to your lab report.

Other

You need to do this installation only once. More technical tips will be posted later as needed. You will be able to get help from the demonstrators or the lecturer during our synchronous sessions.