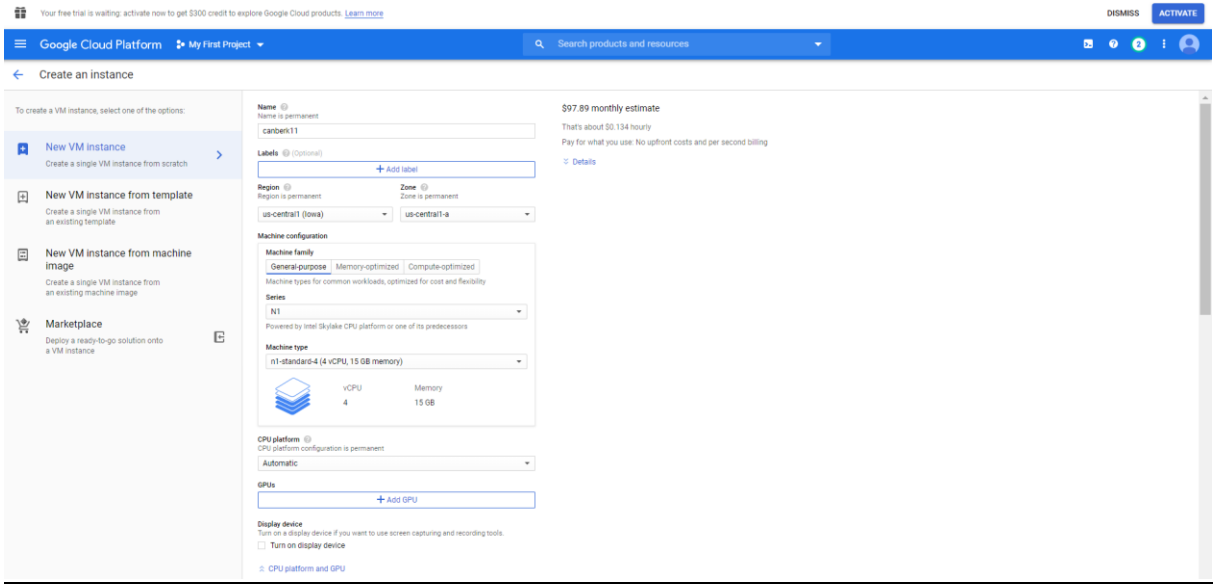
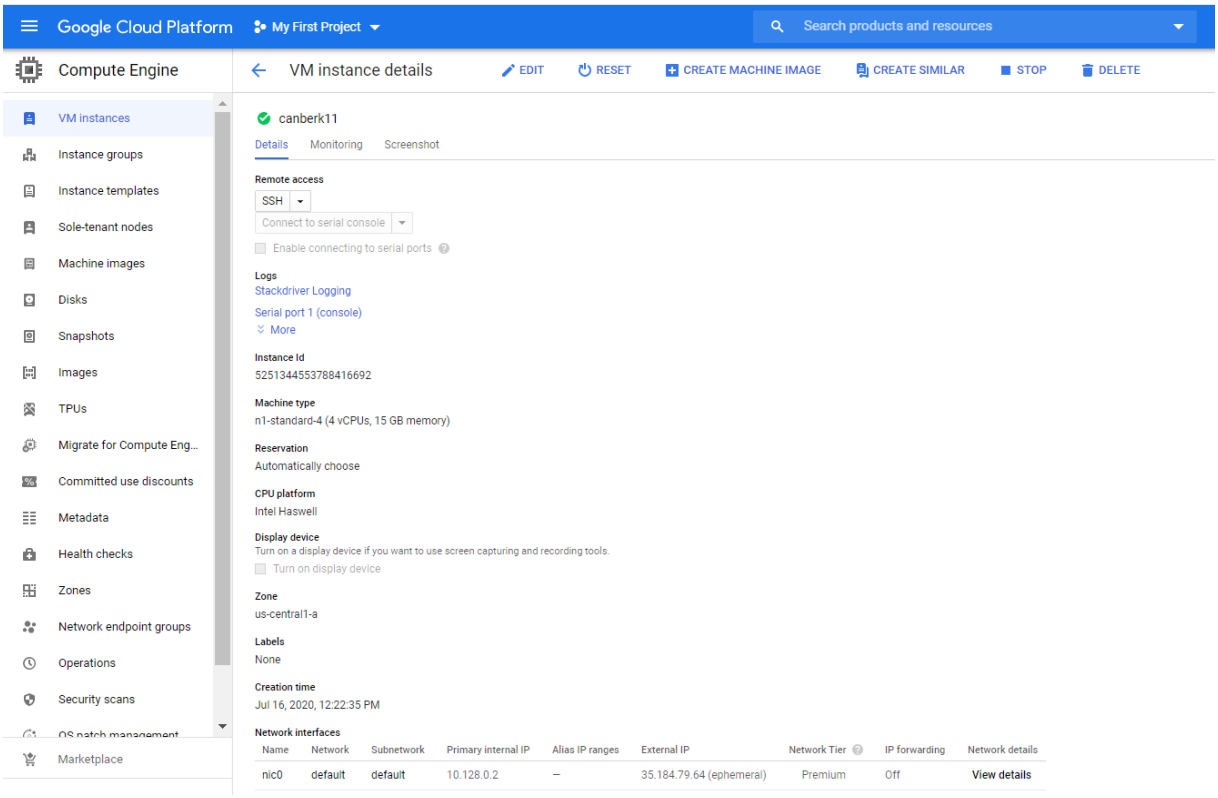
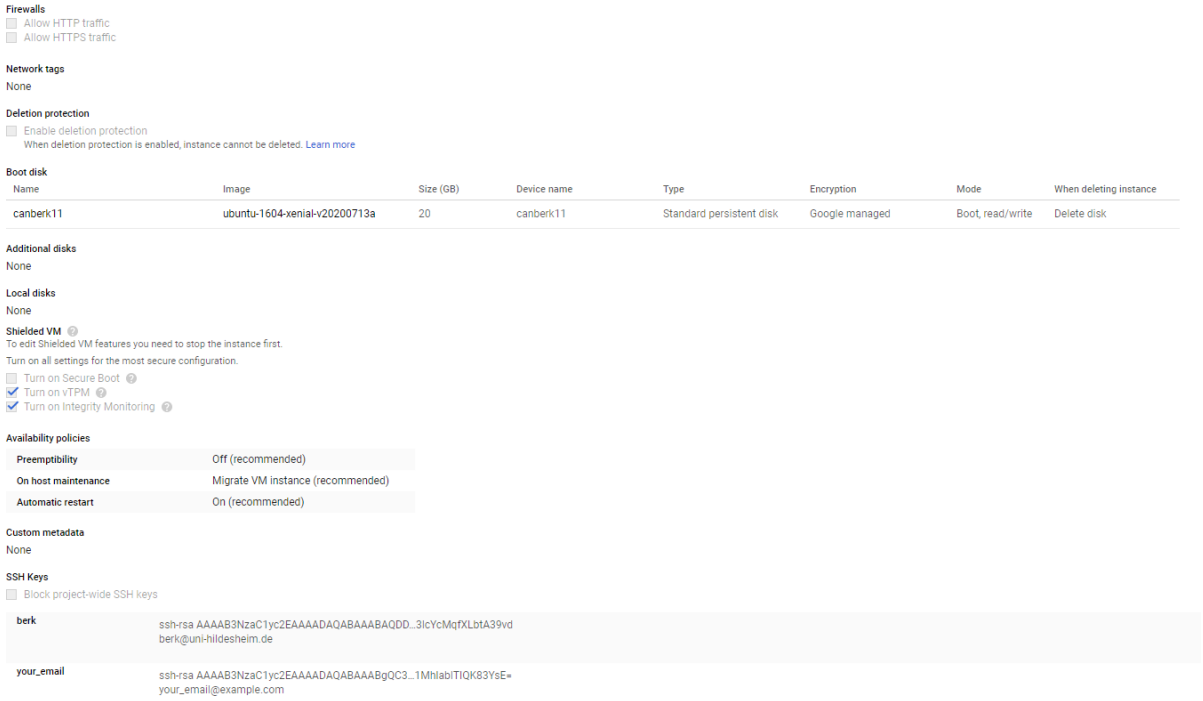
VM instance is created with the given specification



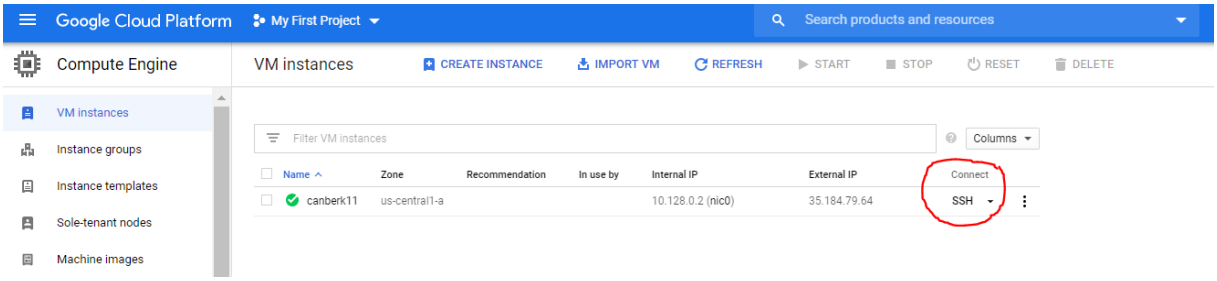
Resulting VM



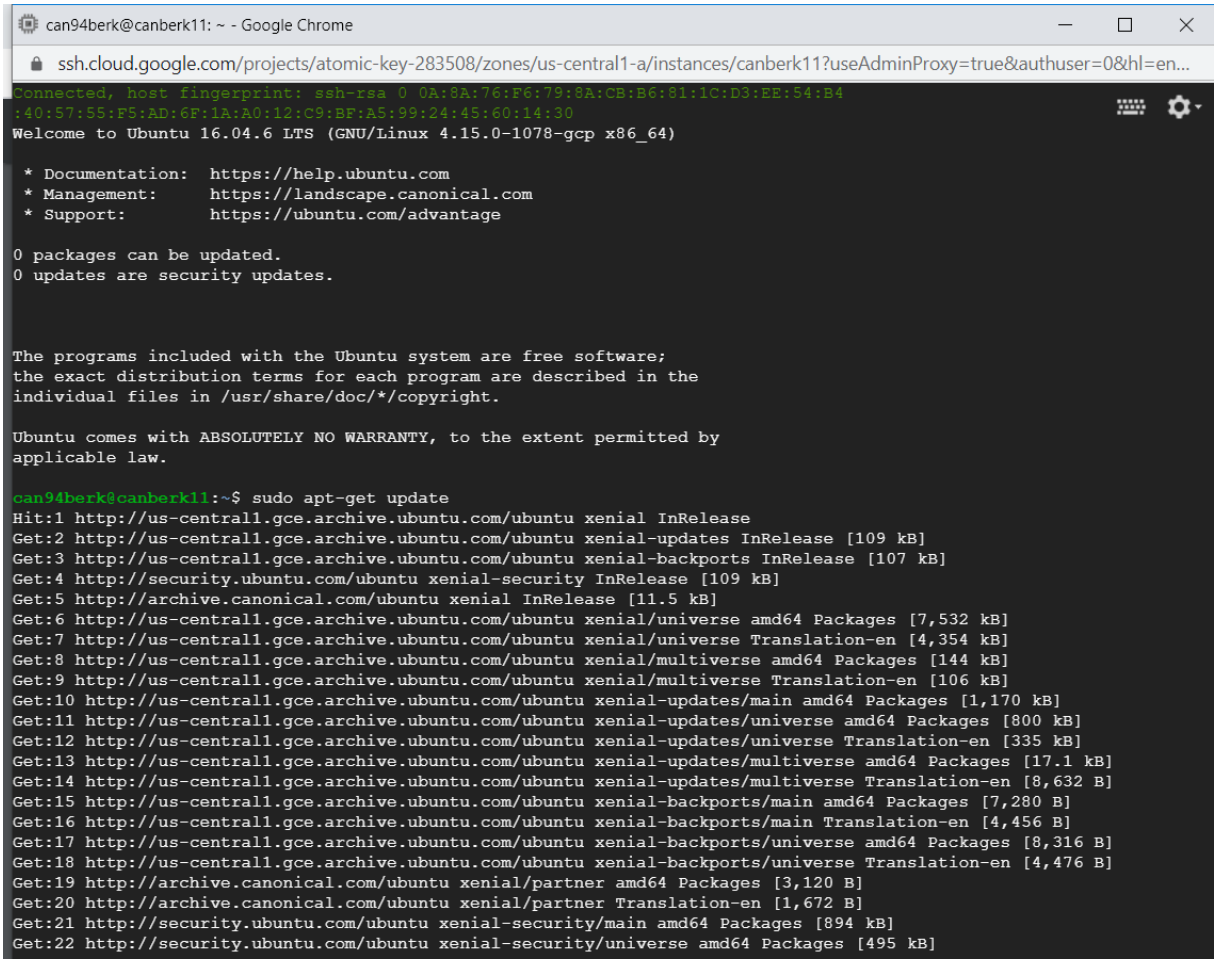


My Ssh key and instructors' Ssh key are entered.

Accessed to VM using SSH connect button



Basic Linux Operations



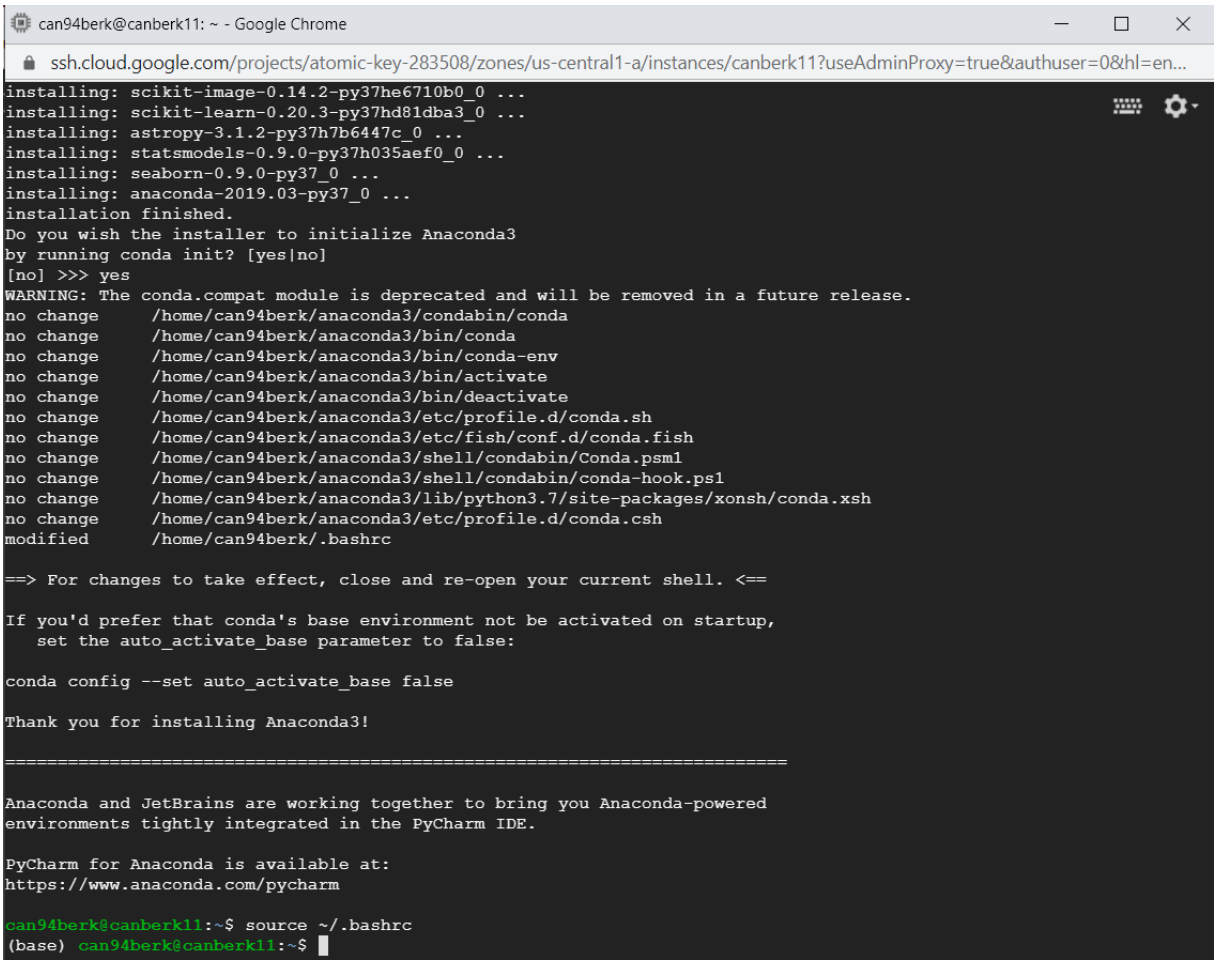
First, install repos are updated and then dummy folder named "Gcssberk" is created. Folders are listed and entered into "Gcssberk" dummy folder to create blank document named berkss.txt, also some text is written there.

Installing Anaconda in VM

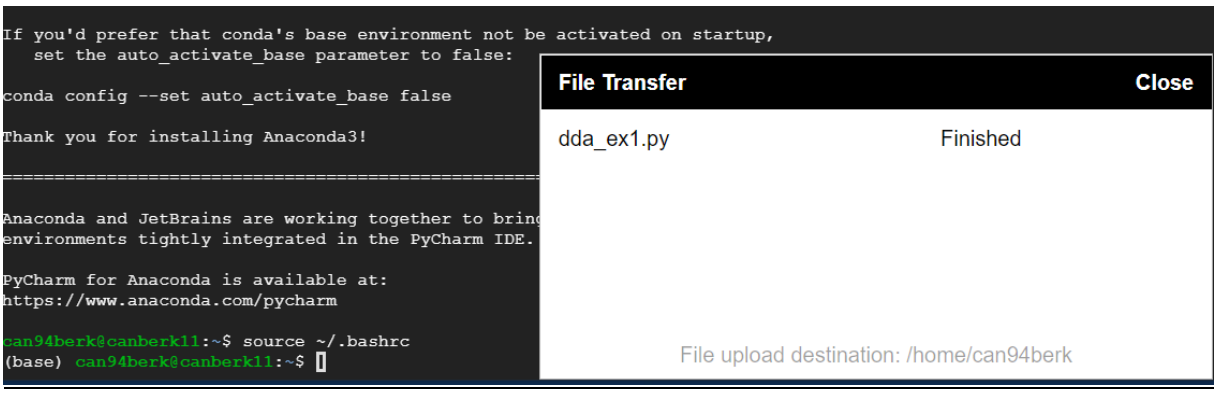
After going home directory with cd command, I downloaded Anaconda using wget and installed it. Also, all necessary paths are initialized through “source ~/.bashrc”.

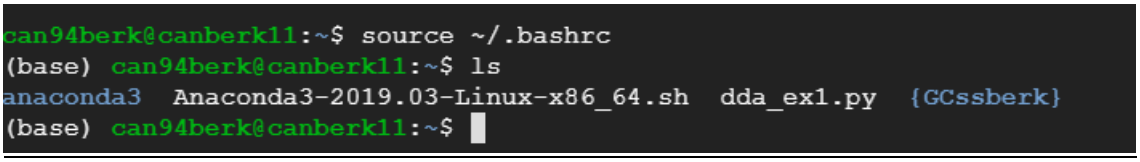
```
can94berk@canberk11:~/{GCssberk}$ cd
can94berk@canberk11:~$ wget https://repo.anaconda.com/archive/Anaconda3-2019.03-Linux-x86_64.sh
--2020-07-16 11:31:22--  https://repo.anaconda.com/archive/Anaconda3-2019.03-Linux-x86_64.sh
Resolving repo.anaconda.com (repo.anaconda.com)... 104.16.131.3, 104.16.130.3, 2606:4700::6810:8303, ...
Connecting to repo.anaconda.com (repo.anaconda.com)|104.16.131.3|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 685906562 (654M) [application/x-sh]
Saving to: ‘Anaconda3-2019.03-Linux-x86_64.sh’

Anaconda3-2019.03-Linux-x86_ 100%[=========================================>] 654.13M   232MB/s    in 2.8s

2020-07-16 11:31:25 (232 MB/s) - ‘Anaconda3-2019.03-Linux-x86_64.sh’ saved [685906562/685906562]

can94berk@canberk11:~$ bash ./Anaconda3-2019.03-Linux-x86_64.sh

Welcome to Anaconda3 2019.03

In order to continue the installation process, please review the license
agreement.
Please, press ENTER to continue
>>>
==================================
Anaconda End User License Agreement
==================================

Copyright 2015, Anaconda, Inc.

All rights reserved under the 3-clause BSD License:

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the fo
llowing conditions are met:

  * Redistributions of source code must retain the above copyright notice, this list of conditions and the followin
g disclaimer.
  * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the follo
```

```
Anaconda3 will now be installed into this location:
/home/can94berk/anaconda3

  - Press ENTER to confirm the location
  - Press CTRL-C to abort the installation
  - Or specify a different location below

[/home/can94berk/anaconda3] >>>
```



Moving files to VM





Run Labs

Exercise 1 from Exercise Sheet-9 ➔

```
(base) can94berk@canberk11:~$ python dda_ex1.py
downloading Olivetti faces from https://ndownloader.figshare.com/files/5976027 to /home/can94berk/scikit_learn_data
(400, 4096)
(400,)
iteration: 100  Accuracy: 0.0 %
iteration: 200  Accuracy: 5.0 %
iteration: 300  Accuracy: 5.0 %
iteration: 400  Accuracy: 12.5 %
iteration: 500  Accuracy: 32.5 %
iteration: 600  Accuracy: 42.5 %
iteration: 700  Accuracy: 52.5 %
iteration: 800  Accuracy: 62.5 %
iteration: 900  Accuracy: 72.5 %
iteration: 1000  Accuracy: 87.5 %
iteration: 1100  Accuracy: 90.0 %
iteration: 1200  Accuracy: 92.5 %
iteration: 1300  Accuracy: 95.0 %
iteration: 1400  Accuracy: 95.0 %
iteration: 1500  Accuracy: 95.0 %
iteration: 1600  Accuracy: 97.5 %
iteration: 1700  Accuracy: 97.5 %
iteration: 1800  Accuracy: 97.5 %
iteration: 1900  Accuracy: 97.5 %
iteration: 2000  Accuracy: 97.5 %
iteration: 2100  Accuracy: 97.5 %
iteration: 2200  Accuracy: 97.5 %
iteration: 2300  Accuracy: 97.5 %
iteration: 2400  Accuracy: 97.5 %
iteration: 2500  Accuracy: 100.0 %
iteration: 2600  Accuracy: 100.0 %
iteration: 2700  Accuracy: 100.0 %
iteration: 2800  Accuracy: 100.0 %
iteration: 2900  Accuracy: 100.0 %
iteration: 3000  Accuracy: 100.0 %
iteration: 3100  Accuracy: 100.0 %
iteration: 3200  Accuracy: 100.0 %
iteration: 3300  Accuracy: 100.0 %
iteration: 3400  Accuracy: 100.0 %
iteration: 3500  Accuracy: 100.0 %
iteration: 3600  Accuracy: 100.0 %
iteration: 3700  Accuracy: 100.0 %
iteration: 3800  Accuracy: 100.0 %
iteration: 3900  Accuracy: 100.0 %
iteration: 4000  Accuracy: 100.0 %
Time: 0m 37s
(base) can94berk@canberk11:~$
```

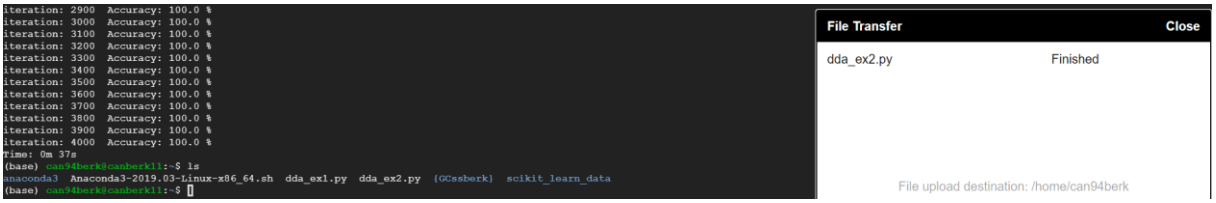
Here, I used my solution from previous tutorial and plotting the graph is modified with # to not be executed. It took longer than my result in previous lab which was 34 seconds.

Also, pytorch is installed separately as this exercise uses it.

```
(base) can94berk@canberk11:~$ conda install pytorch torchvision cpuonly -c pytorch
```

Exercise 2 from Exercise Sheet-9 ➔

First, file is uploaded to VM.



This time, plt.savefig() is used for the graph to be saved along with plt.close(fig) to not show it as it cant be. Result is ➔

```
(base) can94berk@canberk11:~$ ls
anaconda3  Anaconda3-2019.03-Linux-x86_64.sh  dda_ex1.py  dda_ex2.py  {GCssberk}  scikit_learn_data
(base) can94berk@canberk11:~$ python dda_ex2.py
(400, 4096)
(400,)
iteration: 100  Accuracy: 12.5 %
iteration: 200  Accuracy: 12.5 %
iteration: 300  Accuracy: 7.5 %
iteration: 400  Accuracy: 10.0 %
iteration: 500  Accuracy: 17.5 %
iteration: 600  Accuracy: 20.0 %
iteration: 700  Accuracy: 22.5 %
iteration: 800  Accuracy: 27.5 %
iteration: 900  Accuracy: 47.5 %
iteration: 1000  Accuracy: 60.0 %
iteration: 1100  Accuracy: 65.0 %
iteration: 1200  Accuracy: 67.5 %
iteration: 1300  Accuracy: 72.5 %
iteration: 1400  Accuracy: 75.0 %
iteration: 1500  Accuracy: 80.0 %
iteration: 1600  Accuracy: 80.0 %
iteration: 1700  Accuracy: 80.0 %
iteration: 1800  Accuracy: 87.5 %
iteration: 1900  Accuracy: 87.5 %
iteration: 2000  Accuracy: 87.5 %
iteration: 2100  Accuracy: 87.5 %
iteration: 2200  Accuracy: 87.5 %
iteration: 2300  Accuracy: 87.5 %
iteration: 2400  Accuracy: 87.5 %
iteration: 2500  Accuracy: 87.5 %
iteration: 2600  Accuracy: 87.5 %
iteration: 2700  Accuracy: 87.5 %
iteration: 2800  Accuracy: 87.5 %
iteration: 2900  Accuracy: 87.5 %
iteration: 3000  Accuracy: 87.5 %
iteration: 3100  Accuracy: 87.5 %
iteration: 3200  Accuracy: 87.5 %
iteration: 3300  Accuracy: 87.5 %
iteration: 3400  Accuracy: 90.0 %
iteration: 3500  Accuracy: 90.0 %
iteration: 3600  Accuracy: 90.0 %
iteration: 3700  Accuracy: 90.0 %
iteration: 3800  Accuracy: 90.0 %
iteration: 3900  Accuracy: 90.0 %
iteration: 4000  Accuracy: 90.0 %
Time: 0m 40s
(base) can94berk@canberk11:~$
```

Code is executed and only difference is time is 2 seconds longer than my result in previous lab in same exercise probably due to system specifications.

Also, graph is saved to VM as “dda9_ex2_result.png”

```
(base) can94berk@canberk11:~$ ls
anaconda3  Anaconda3-2019.03-Linux-x86_64.sh  dda9_ex2_result.png  dda_ex1.py  dda_ex2.py  {GCssberk}  scikit_learn_data
```

As I did only exercise 1 and exercise 2 in Exercise Sheet 9 and process is repeating itself I’m going to stop here.