TRƯỜNG ĐẠI HỌC KINH TẾ QUỐC DÂN

KHOA TOÁN KINH TẾ

Machine Learning

PART II

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Make sure your submission is either in notebook (.ipynb) or LaTeXformat. You can install jupyter notebook down to your machine, or Google Colab so you dont have to care about managing virtual environment.

In this homework, you will have a datafile, download it to your local machine, then load it with Jupyter Notebook, or upload it to your Google Drive so that you can use with Google Colab.

Problem 1
Re-implement TSNE.

Problem 2
Load MNIST dataset (preferably from keras, but you can use sklearn if you want)

```
from keras.datasets import mnist
# or
from sklearn import datasets
data = datasets.load_digits()
```

Visualize the image.

Problem 3
Use YOUR IMPLEMENTATION ON PCA, as well as the design of T-SNE from above to reduce-dimension into 2 and 3 dimensions, then visualize them (You can use plotly to plot 3D chart to make it interactive). Give your comments on the result.