ECBM E4040
Neural Networks and Deep Learning

Introduction to
Computing Resources

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Key Course Sites

- 2019: https://courseworks2.columbia.edu/courses/85261
- Webpage with instructions https://ecbm4040.bitbucket.io/
- Google drive https://drive.google.com/drive/folders/1y3b9Wk7dSHH5t0V9rrxjGrJ2l9Rg-O1e

Deep Learning
Deep Learning Tools, Software, Platforms

Deep Learning Frameworks and tools

- Google TensorFlow (https://www.tensorflow.org/)
- PyTorch (http://pytorch.org/)
- Keras (https://keras.io/)
- cuDNN (https://developer.nvidia.com/cudnn)
- …
- Torch (http://torch.ch/)
- Theano (http://deeplearning.net/software/theano/)
- Lasagne (http://lasagne.readthedocs.io/en/latest/index.html)
- Caffee (http://caffe.berkeleyvision.org/)
- …

Tools
TensorFlow Framework

An open-source software library for Machine Intelligence

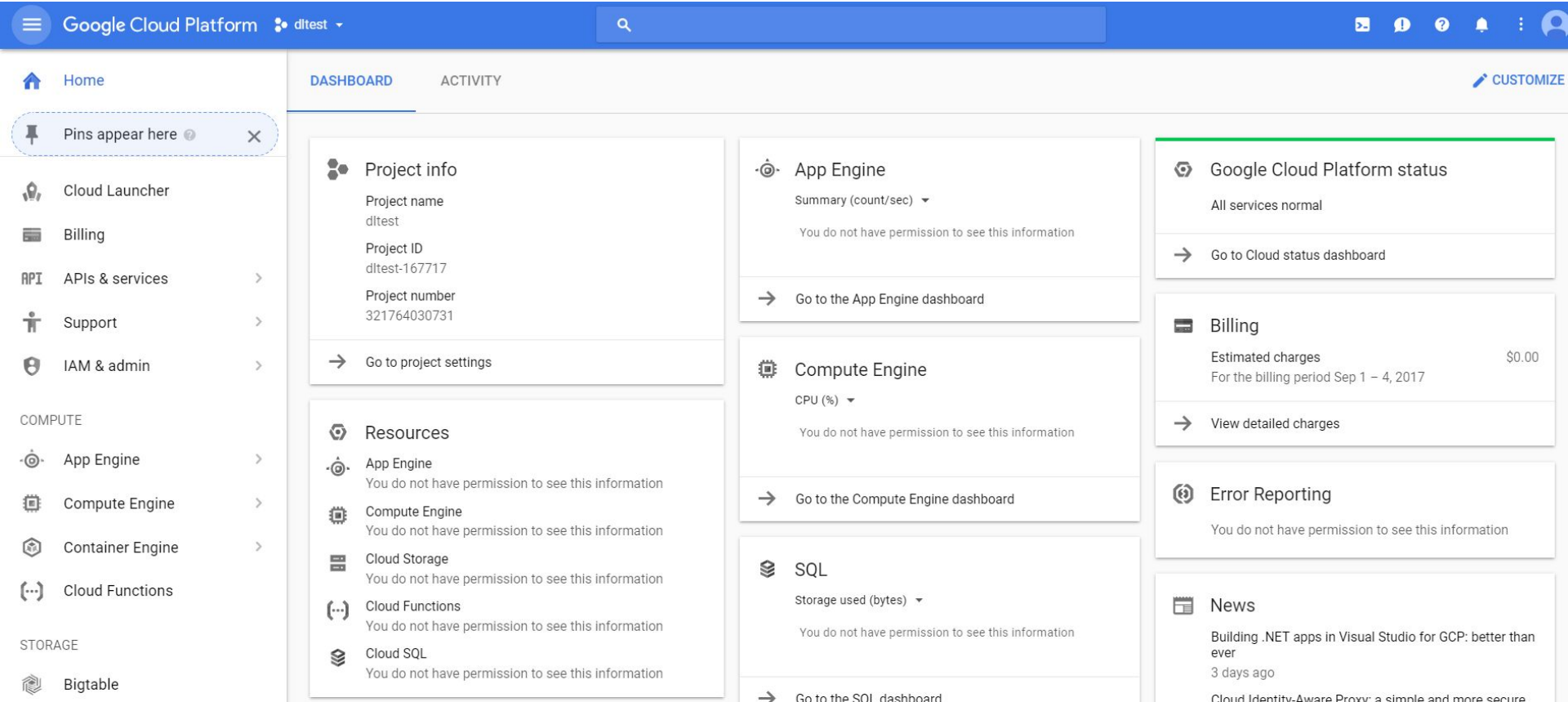
- **for numerical computation using data flow graphs.**
- **Nodes in the graph represent mathematical operations, while the graph edges represent the multidimensional data arrays (tensors) communicated between them.**
- **The flexible architecture allows you to deploy computation to one or more CPUs or GPUs in a desktop, server, or mobile device with a single API.**
- **Major changes in TF2.0: eager execution, keras, "pythonic behavior"**
- **https://www.tensorflow.org/**

Tools
(Python) Jupyter Notebook

- **The Jupyter Notebook is an open-source web application that allows you to create and share documents**
- **that contain live code, equations, visualizations and explanatory text.**
- **Uses include: data cleaning and transformation, numerical simulation, statistical modeling, machine learning and much more.**

- **http://jupyter.org/**

Tools -Google Cloud - https://console.cloud.google.com/home/dashboard



Tools
Laptop Execution

TensorFlow

- **https://www.tensorflow.org/install/**

Tools
Git: Github (or Bitbucket)

Github/Bitbucket: Source code control, assignment distribution and collection

- **https://bitbucket.org/product, https://guides.github.com/**
- **Server side**
- **Client side (options: command line, GitKraken, SourceTree, …)**

Course-related:

- **https://ecbm4040.bitbucket.io/ for web pages**
- **assignments distributed through courseworks, or through Github Classroom (2019)**

Tools
Google (Lion) Drive: docs, sheets, slides

- **see syllabus**

Tools
Courseworks, Piazza and Zoom

Courseworks:

- **2019: https://courseworks2.columbia.edu/courses/85261**
- **2018 - https://courseworks2.columbia.edu/courses/61441**
- **2017: https://courseworks2.columbia.edu/courses/39486**

Piazza:

2019 - https://piazza.com/class/jzvkkbkmfny2el

Zoom (webinars): To be created as needed

Backup Slides

Various