UC San Diego Extension
Cloud Services for Machine Learning

Summer 2020
Homework#1

Date Given: June 29, 2020 Due Date: July 5, 2020

==========

1. What is cloud computing? Enumerate the benefits a business realizes using cloud services.

Cloud computing is use of remote servers on the internet to compute and store data instead of using a local server or personal computer.

The major advantages of cloud computing are as follows.

- Eliminate capital expense to buy hardware and software
- Only pay for what you use
- Cost effective
- Performance
- Software is always update
- Productivity
- IT Teams work on serving customers instead of maintaining hardware and software
- Scalable Architecture. If load increases on a server more hardware resources can be added
- Flexibility: Change hardware configuration as needed
- Better Security of data

==========

2. Why it is preferable to run Deep Learning models on a cloud server?

   For Machine Learning (ML) and Deep Learning (DL) models we prefer to use Cloud servers is because the ML/DL models consume lot of computing and storage resources which are usually not available on personal computers.

==========

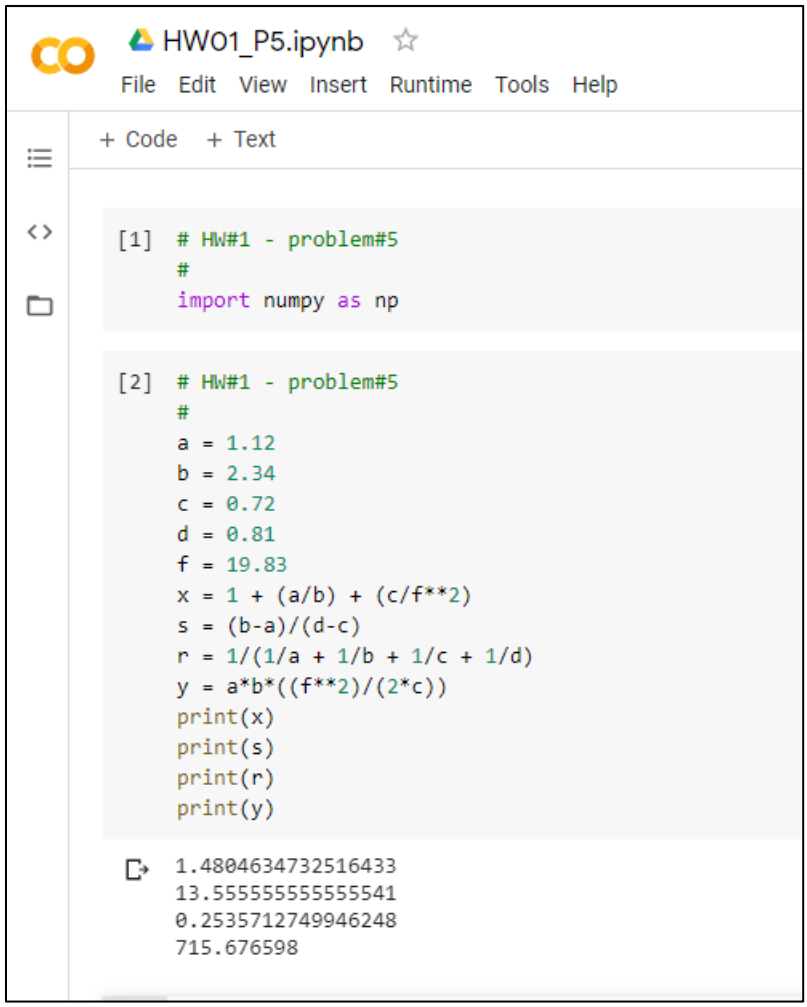
3. Briefly compare the 3 major cloud service providers: Amazon Web Services (AWS), Microsoft's Azure, Google Cloud Platform (GCP).

4. Create a Google Cloud Platform (GCP) account. Get a credit of $300 for a new GCP account. Copy the screen shot of your GCP console on the answer document. Once you start using GCP account, the credit of $300 will deplete. After the credit balance becomes zero, Google will start charging your credit card for the services rendered by GCP.

   Caution: Please keep a close eye on the amount charged by GCP on your credit card. Stop those GCP services which you no longer use. Check your GCP account balance frequently to avoid GCP overcharging your credit card.

5. If variables a, b, c, d, and f are scalars, write Python program in **Colab** to compute and display the following expressions. Test your statements for the following values.
   a = 1.12, b = 2.34, c = 0.72, d = 0.81, f = 19.83
   Make sure that the answers computed by your Python code matches with the given answers.

	Answers
$x = 1 + \frac{a}{b} + \frac{c}{f^2}$	x = 1.4805
$s = \frac{b-a}{d-c}$	s = 13.5556
$r = \frac{1}{\frac{1}{a}+\frac{1}{b}+\frac{1}{c}+\frac{1}{d}}$	r = 0.2536
$y = ab\frac{1}{c}\frac{f^2}{2}$	y = 715.6766



6. Print the version number of TensorFlow and Keras software packages available on **Colab**.