## Lab 1: Colab and Python tutorial

### CSE 176 Introduction to Machine Learning, Fall 2024

Description: Google Colab (https://colab.research.google.com/) is an online platform for editing, executing, and sharing Jupyter notebooks for Python hosted on Google drive. We will use Colab and Jupyter notebook for all the labs and assignments in this course. The goal of this lab is to get familiar with Colab and Python. This lab has three parts.

## 1 Colab tutorial

URL: https://colab.research.google.com/drive/16pBJQePbqkz3QFV54L4NIkOn1kwpuRrj# scrollTo=oHTd7xQrt-BW

Google sign-in is required to run any Colab notebook. Click "Copy to drive" so that you have a copy of the notebook in your google drive and changes will be saved as you work on the tutorial.

## 2 Python tutorial

https://colab.research.google.com/github/data-psl/lectures2020/blob/master/notebooks/
01\_python\_basics.ipynb

This tutorial introduces basic python programming, NumPy, and Matplotlib. Skip this tutorial if you are already familiar with the subject.

# **3** Computer vision and natural language processing applications

Create your first Colab notebook and use provided API for the following applications. The following package needs to be installed in order to use inference API.

```
!pip install transformers
!pip install diffusers
```

An input image is provided and can be downloaded to your virtual machine.

```
import urllib.request
urllib.request.urlretrieve(
    "https://ucmercedcse176.github.io/files/resource/cat.jpeg",
    "cat.jpeg")
```

### 3.1 Image classification

See code sample in the URL bellow. Use transformers.pipeline instead of huggingface.js. URL: https://huggingface.co/tasks/image-classification

## 3.2 Visual question answering

See code sample in the URL https://huggingface.co/tasks/visual-question-answering

### 3.3 Image to text

See code sample in the URL https://huggingface.co/tasks/image-to-text

# 3.4 Text to image

See code sample in the URL https://huggingface.co/tasks/text-to-image. Display generated images.