Cover Sheet

Faculty name : Computers and Artificial Intelligence - Helwan university

Course name : Selected Topics CS-2

Team number 18

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Paper details

Paper name : UNSUPERVISED REPRESENTATION LEARNING WITH DEEP CONVOLUTIONAL GENERATIVE ADVERSARIAL NETWORKS

Authors name: Kaiming He, Xiangyu Zhang, Shaoqing Ren, and Jian Sun

Publisher name : Soumith Chintala

Content : DC_GAN

Year of publish : 2016

Dataset : The ImageNet

About dataset : The ImageNet dataset is a large-scale image classification dataset that contains over 1.2 million images across 1,000 categories. The dataset is widely used in computer vision research and is often used as a benchmark for evaluating new image classification models.

The implemented algorithms : the ResNet architecture

Results : the authors trained ResNet models with up to 152 layers on the ImageNet dataset and achieved a top-5 error rate of 3.57%, which was significantly better than the previous state-of-the-art result of 3.57%. They also showed that ResNet models can be trained faster and with fewer parameters than previous deep neural network architectures.

General Information on the selected dataset

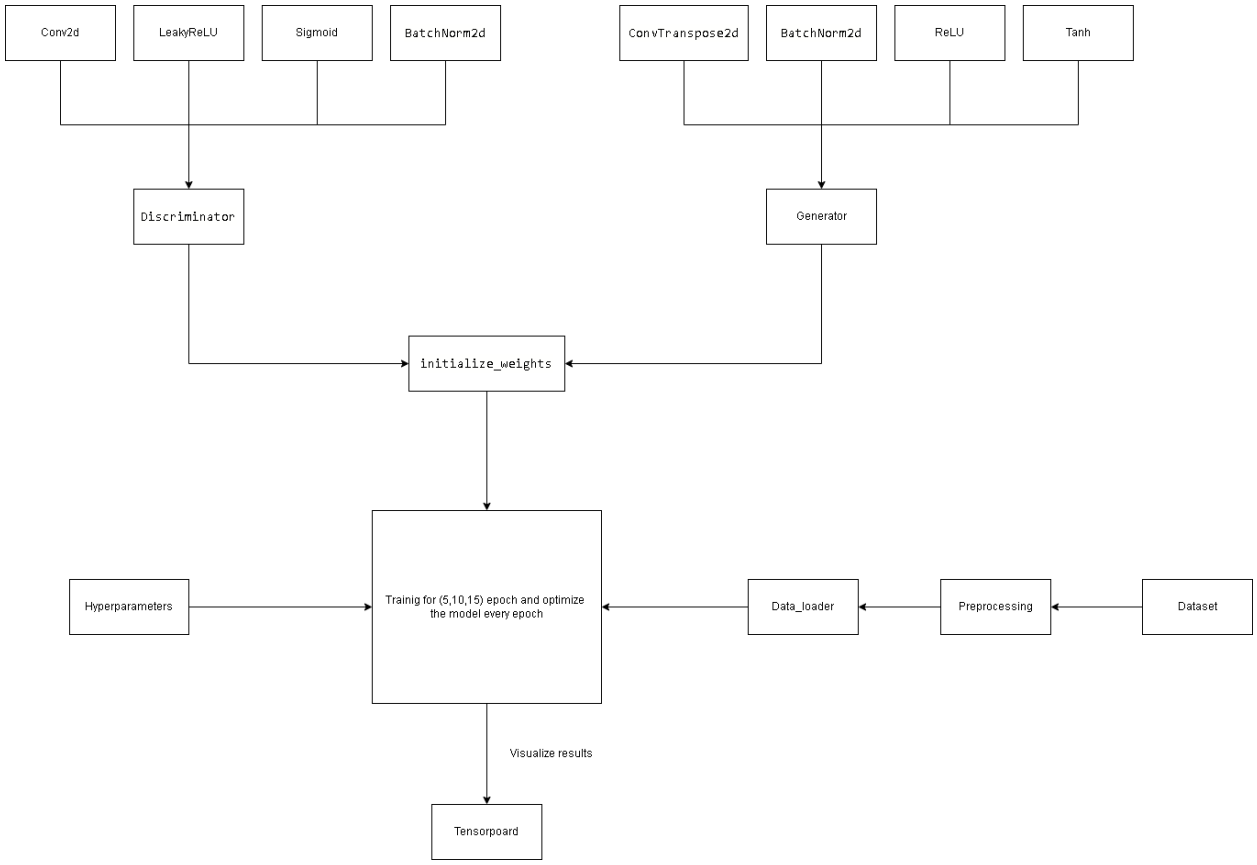
Name : Human Faces

Desciption : A web scraped dataset of human faces suggested for image processing models

Link : https://www.kaggle.com/datasets/ashwingupta3012/human-faces

Total number of samples : 7219

Block diagram for the model



Hyperparameters

Learning rate : 2e-4 (0.0002)

Batch size : {64, 128, 256}

Image size : 64

Noise Dimensions : 100

Number of epochs : {5, 10, 15}

Discriminator features : 64

Generator features : 64

Optimizer : Adam

Results details

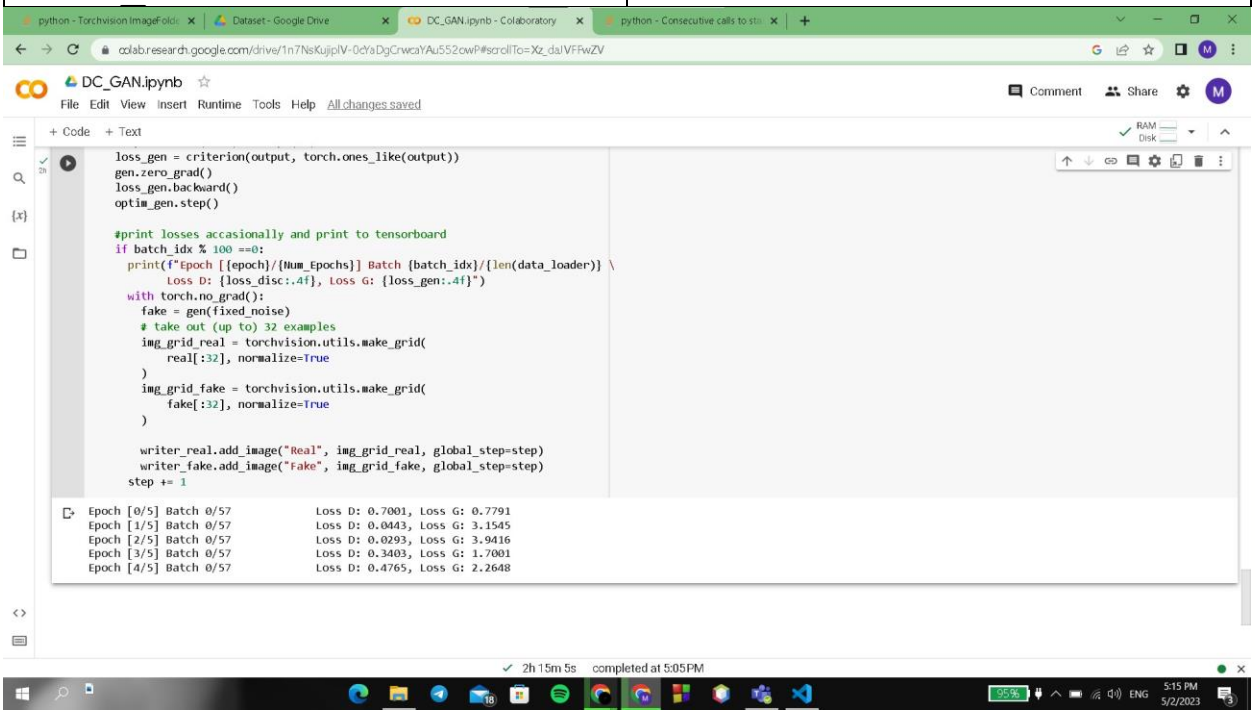
First run

Hyperparameters :

```
Learning_Rate = 2e-4
Batch_Size = 128
Image_size = 64
Channels_img = 3
Z_dim = 100
Num_Epochs = 5
```

CPU

loss_G	2.26
Loss_D	0.47



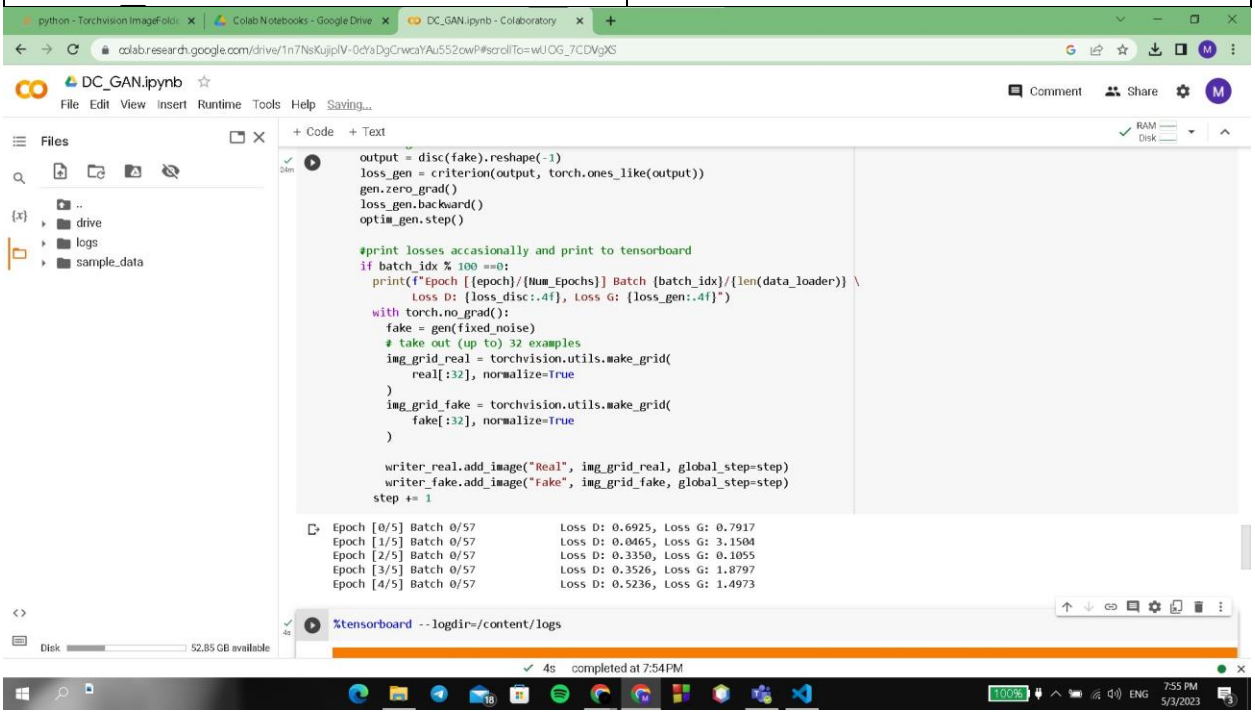
Second run

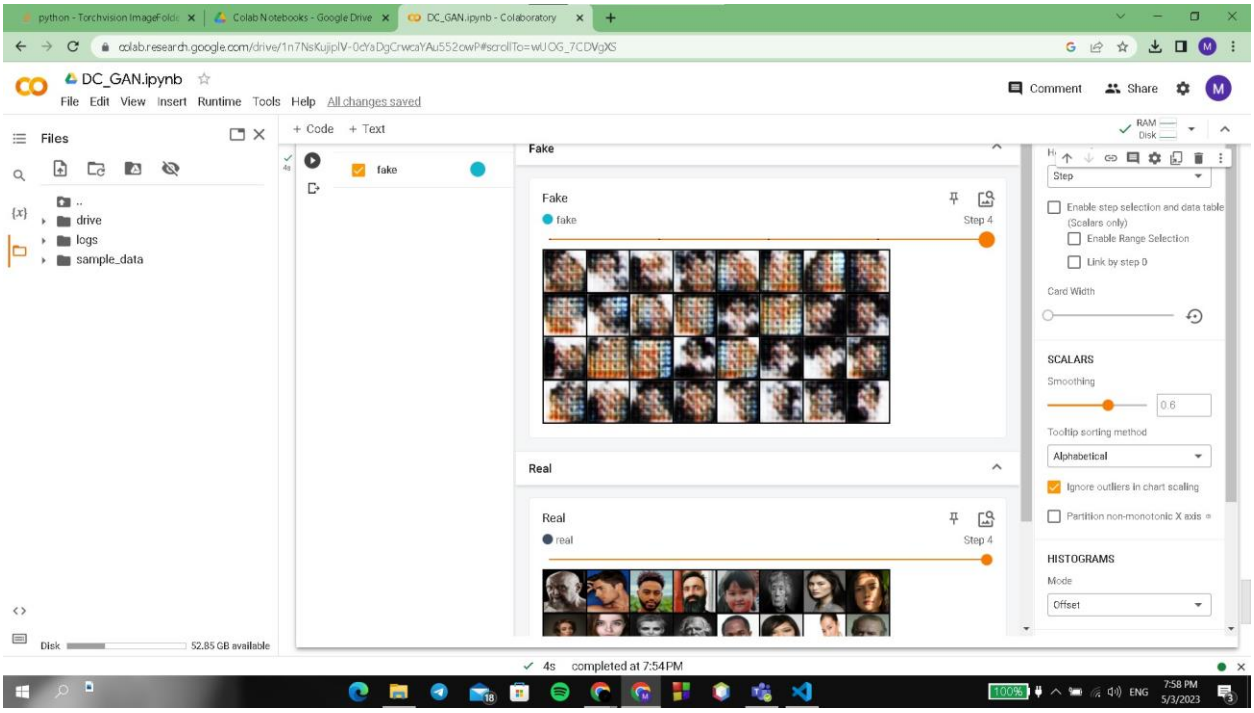
Hyperparameters :

```
Learning_Rate = 2e-4
Batch_Size = 128
Image_size = 64
Channels_img = 3
Z_dim = 100
Num_Epochs = 5

GPU
```

loss_G	1.49
Loss_D	0.52




DC_GAN.ipynb
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Step 4
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SCALARS
Smoothing
0.6
Tooltip sorting method
Alphabetical
Ignore outliers in chart scaling
Partition non-monotonic X axis
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5/3/2023

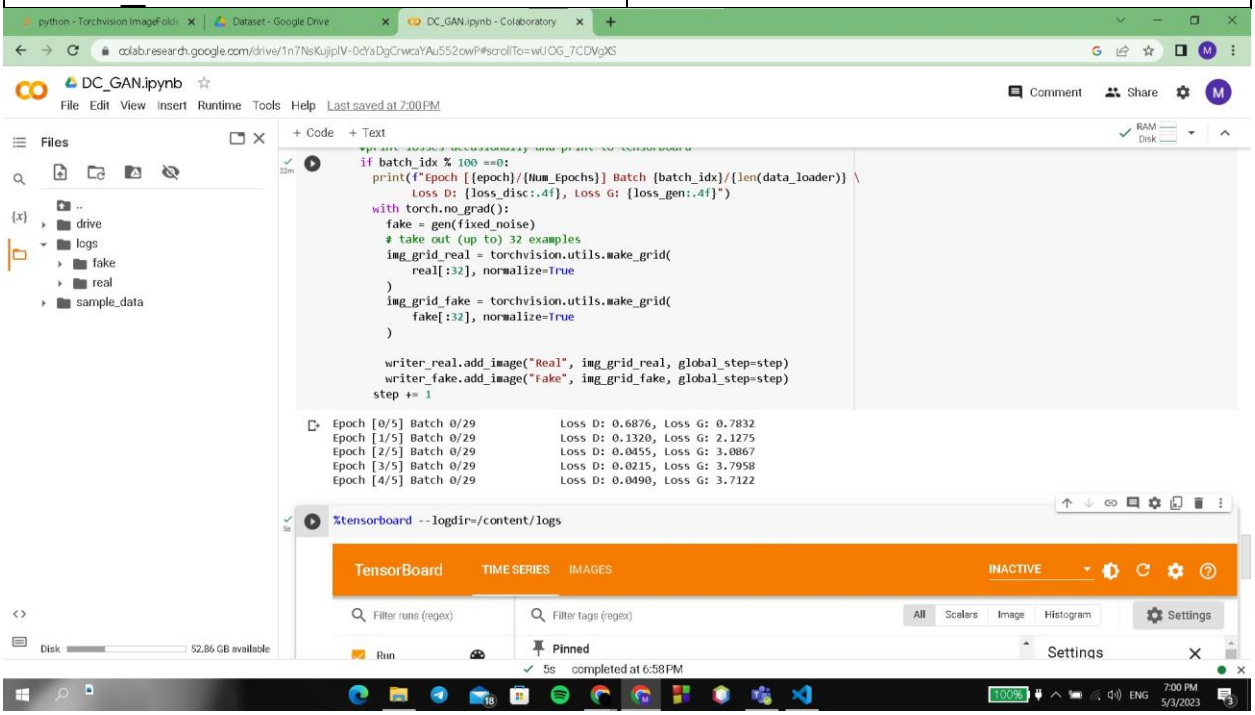
Third run

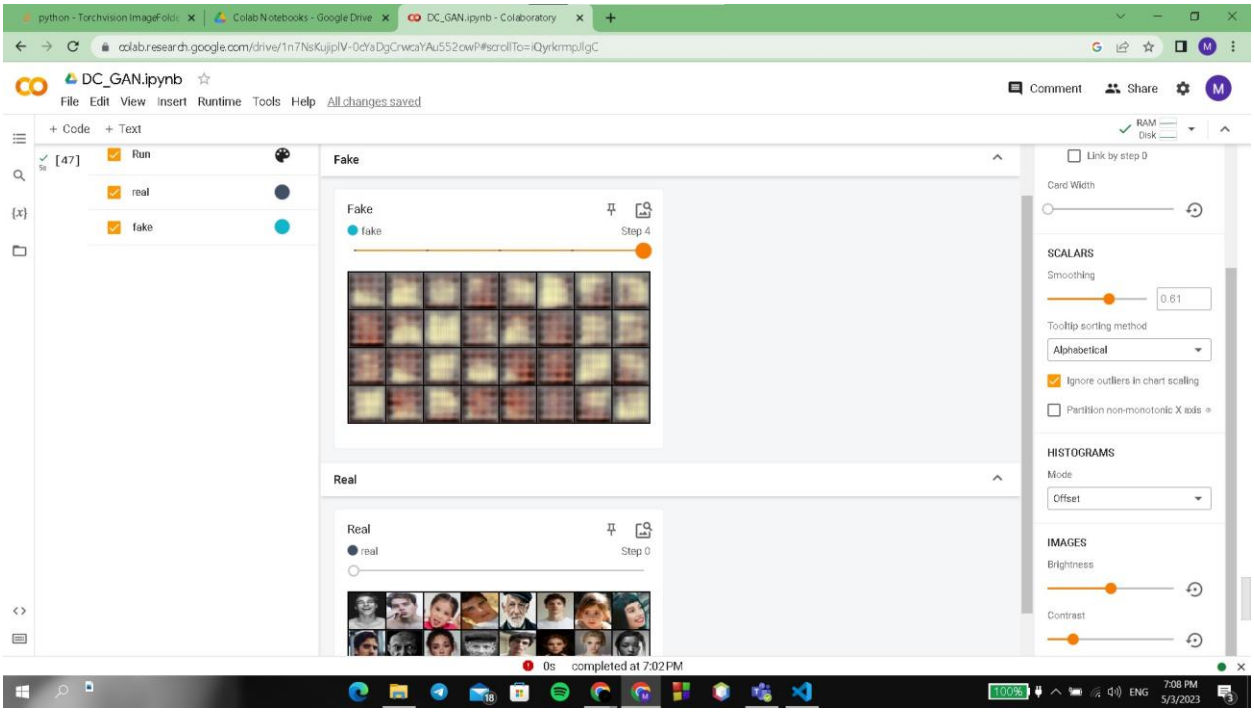
Hyperparameters :

```
Learning_Rate = 2e-4
Batch_Size = 256
Image_size = 64
Channels_img = 3
Z_dim = 100
Num_Epochs = 5

GPU
```

loss_G	3.71
Loss_D	0.049

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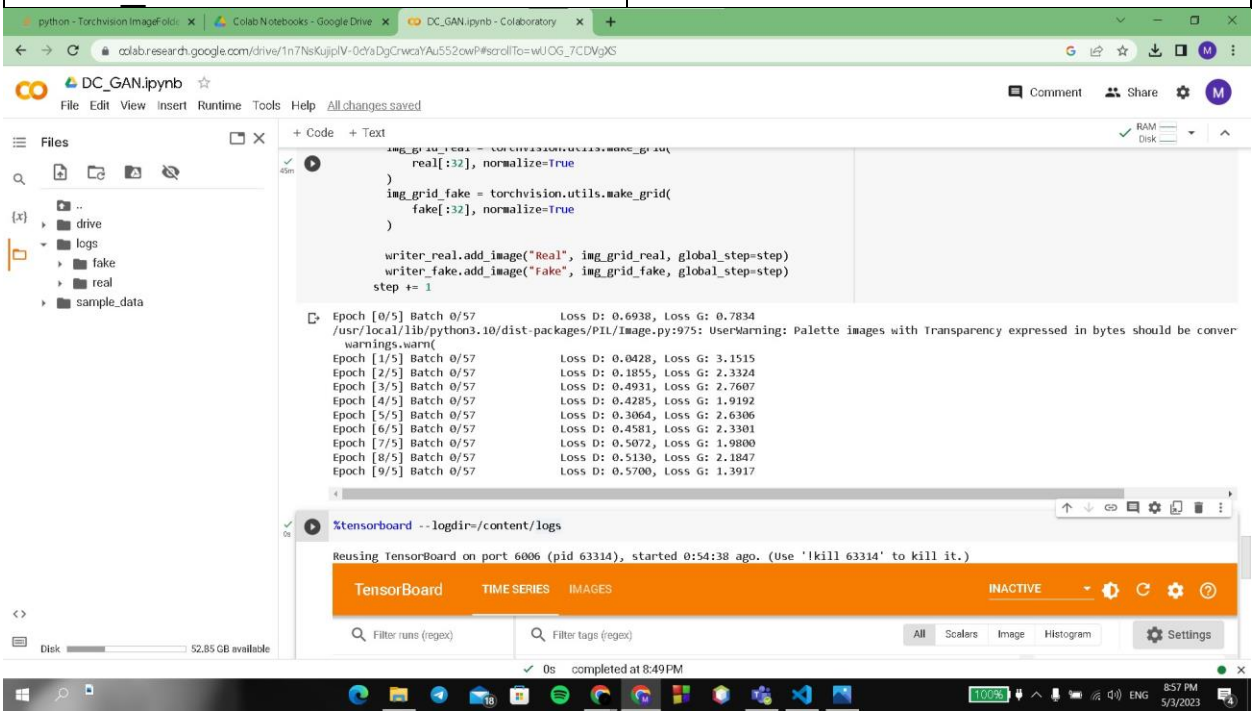
Fourth run

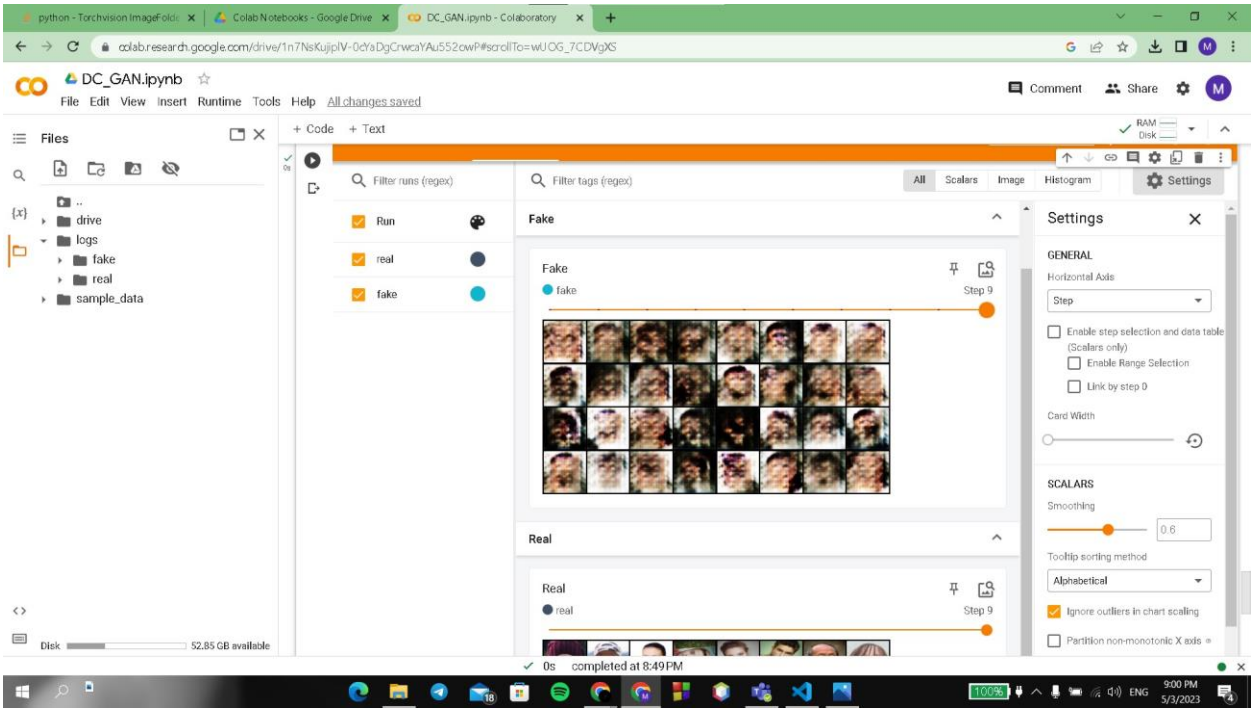
Hyperparameters :

```
Learning_Rate = 2e-4
Batch_Size = 128
Image_size = 64
Channels_img = 3
Z_dim = 100
Num_Epochs = 10

GPU
```

loss_G	1.39
Loss_D	0.57

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Filter runs (regex)
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Step 9
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GENERAL
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Tooltip sorting method
Alphabetical
Ignore outliers in chart scaling
Partition non-monotonic X axis
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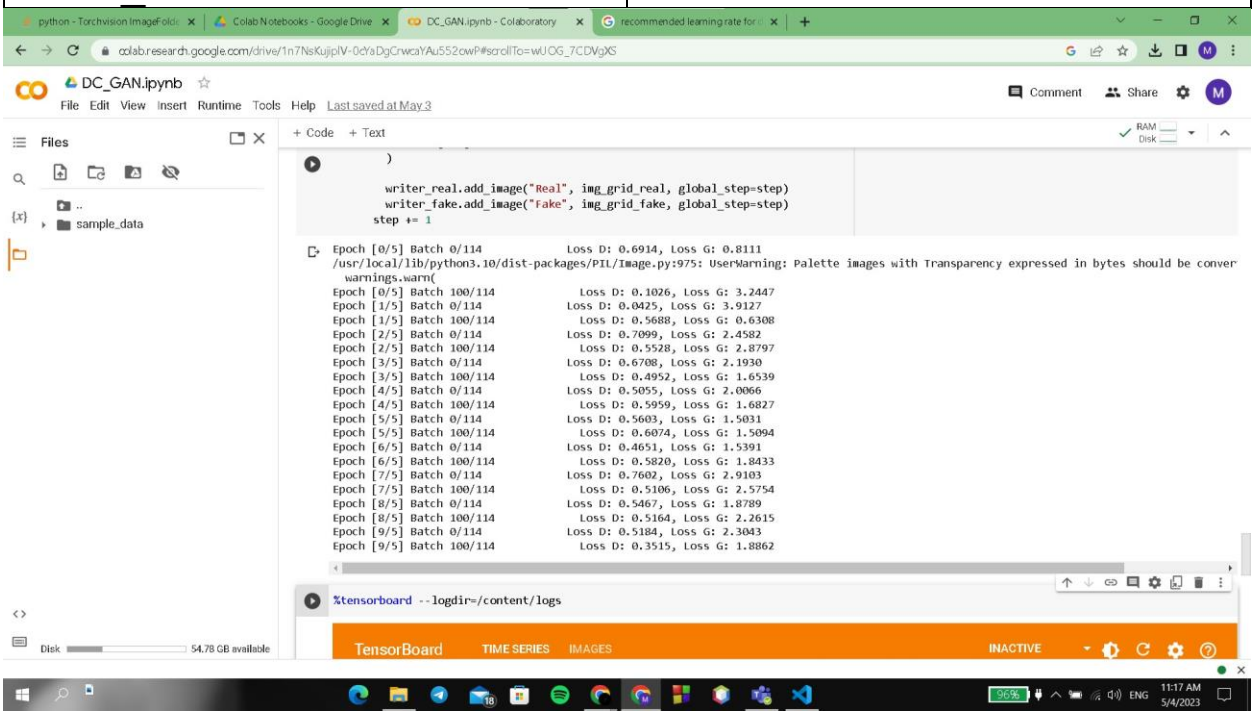
Fifth run

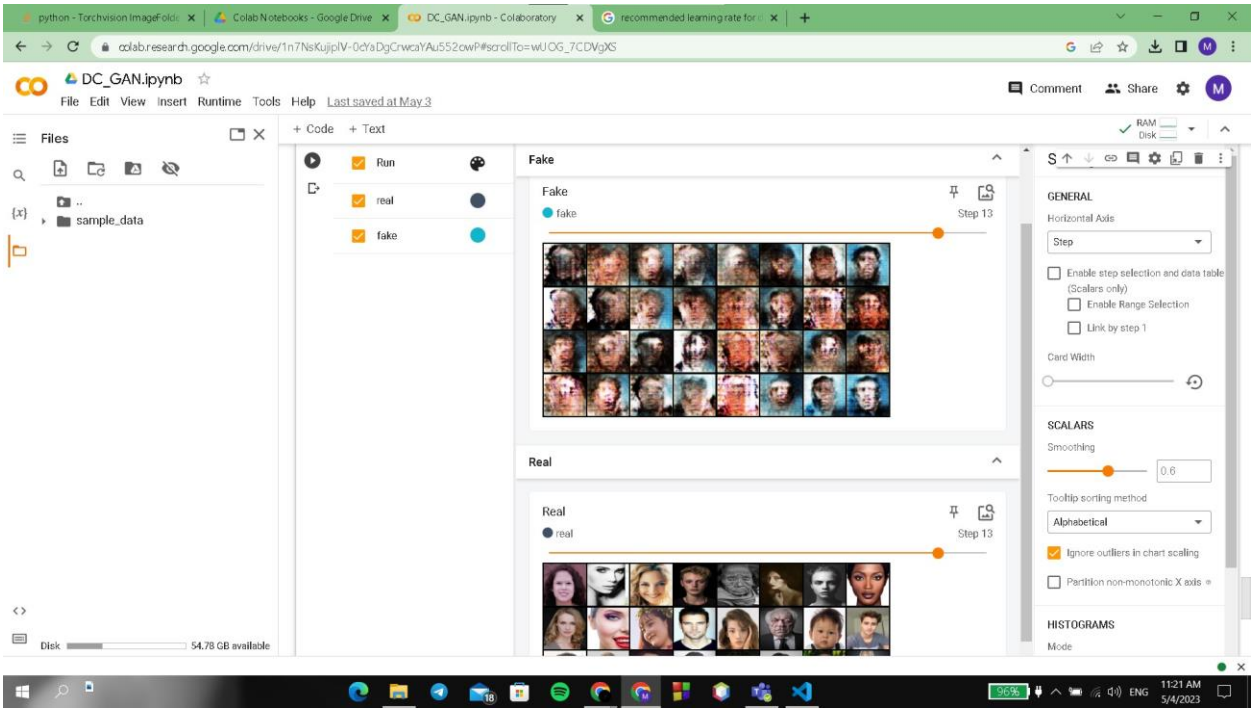
Hyperparameters :

```
Learning_Rate = 2e-4
Batch_Size = 64
Image_size = 64
Channels_img = 3
Z_dim = 100
Num_Epochs = 10

GPU
```

loss_G	1.88
Loss_D	0.35

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Step 13
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Step 13
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Card Width
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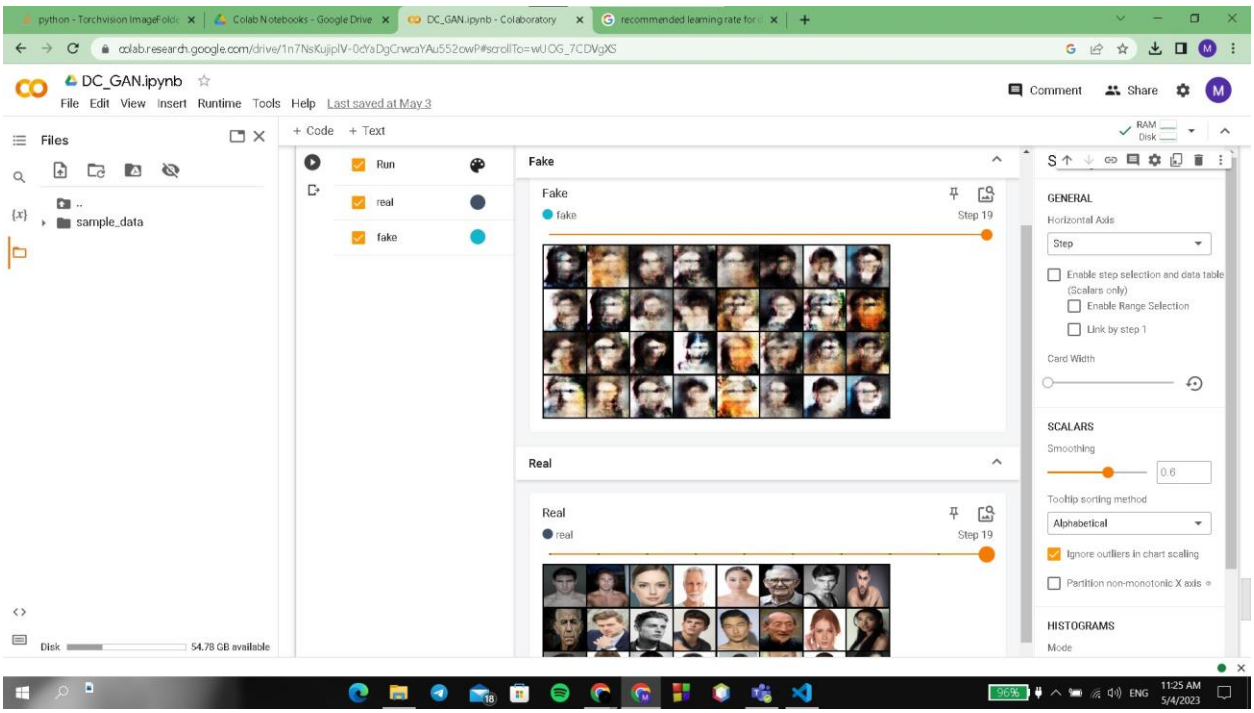
Tooltip sorting method
Alphabetical
Ignore outliers in chart scaling
Partition non-monotonic X axis
HISTOGRAMS
Mode


DC_GAN.ipynb
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Step 19
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Tooltip sorting method
Alphabetical
Ignore outliers in chart scaling
Partition non-monotonic X axis
HISTOGRAMS
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