

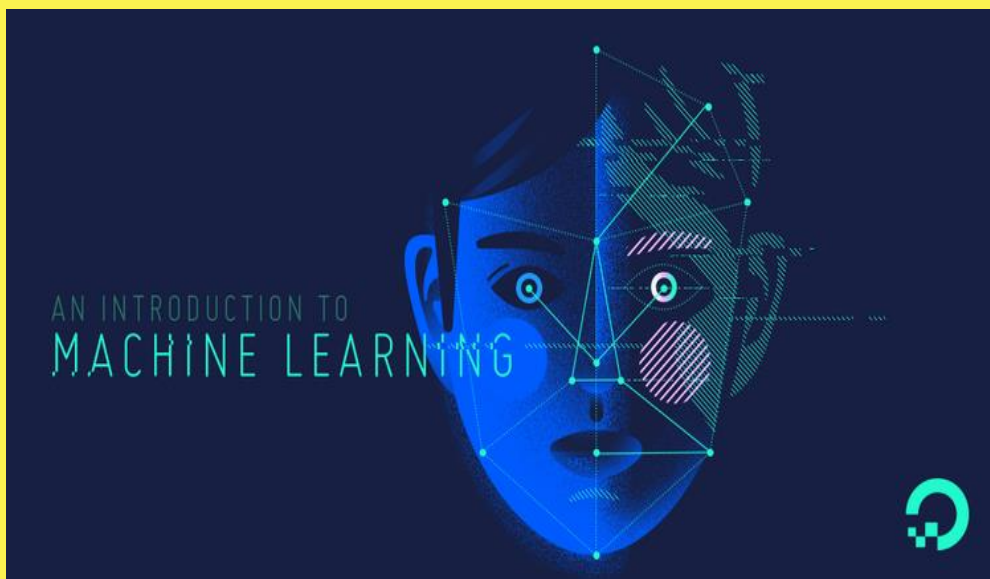
**Government Engineering College, Gandhinagar**  
**Getting started with Machine Learning**  
**"Baby steps in Machine Learning with Google Colabs"**

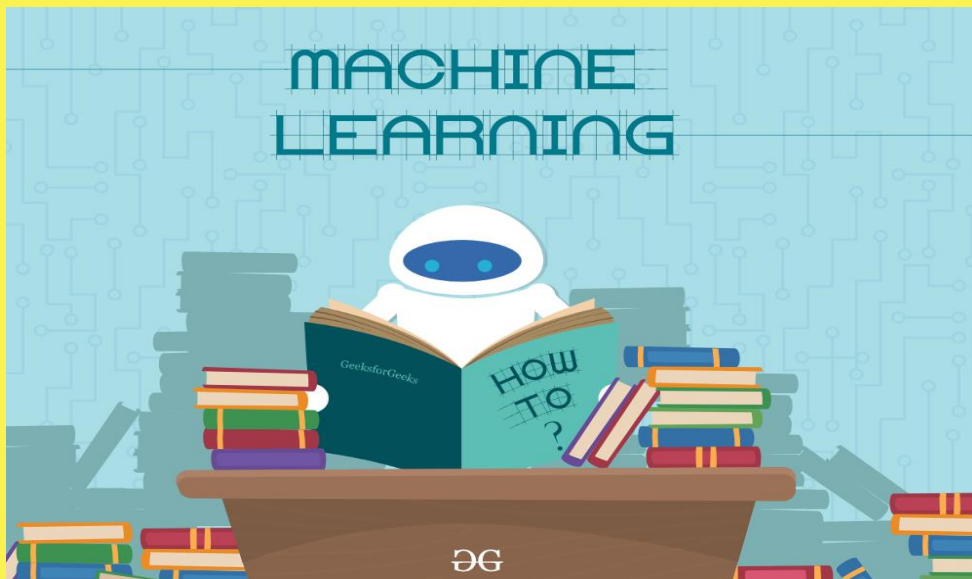
**Date: 04 July 2020**

**Time: 04:30 PM onwards**

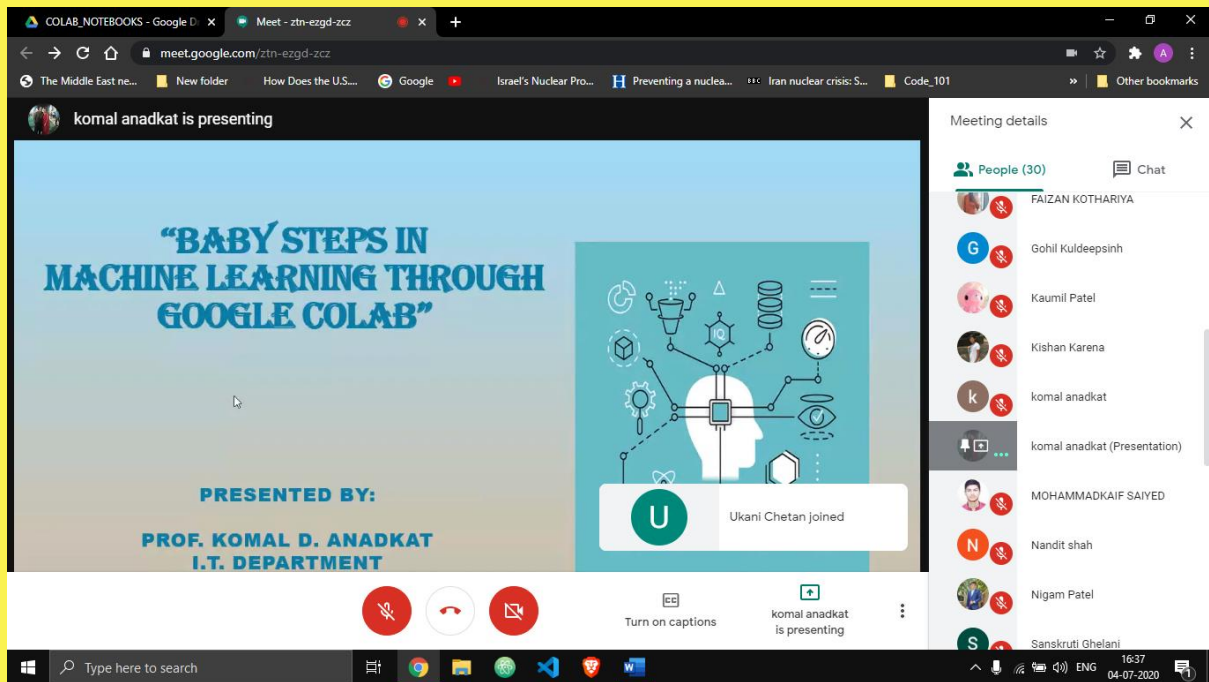
**Speaker: Prof. Komal Anadkat (A.P.I.T)**

**Meeting on: Google Meet**

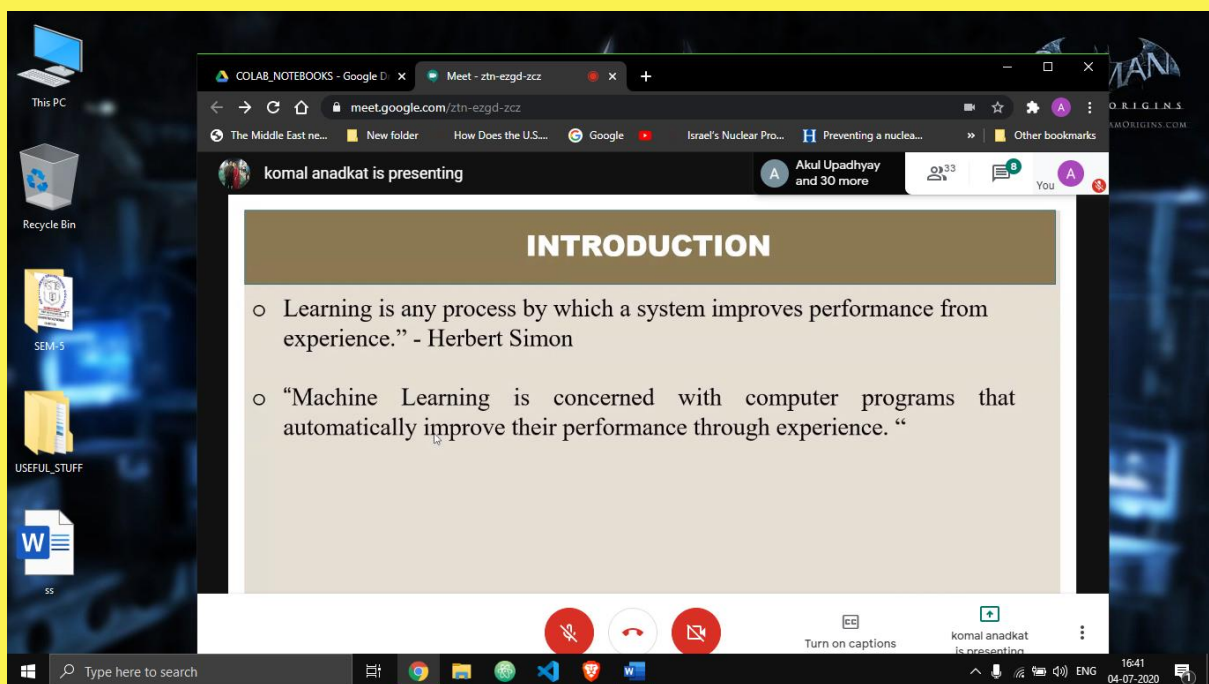
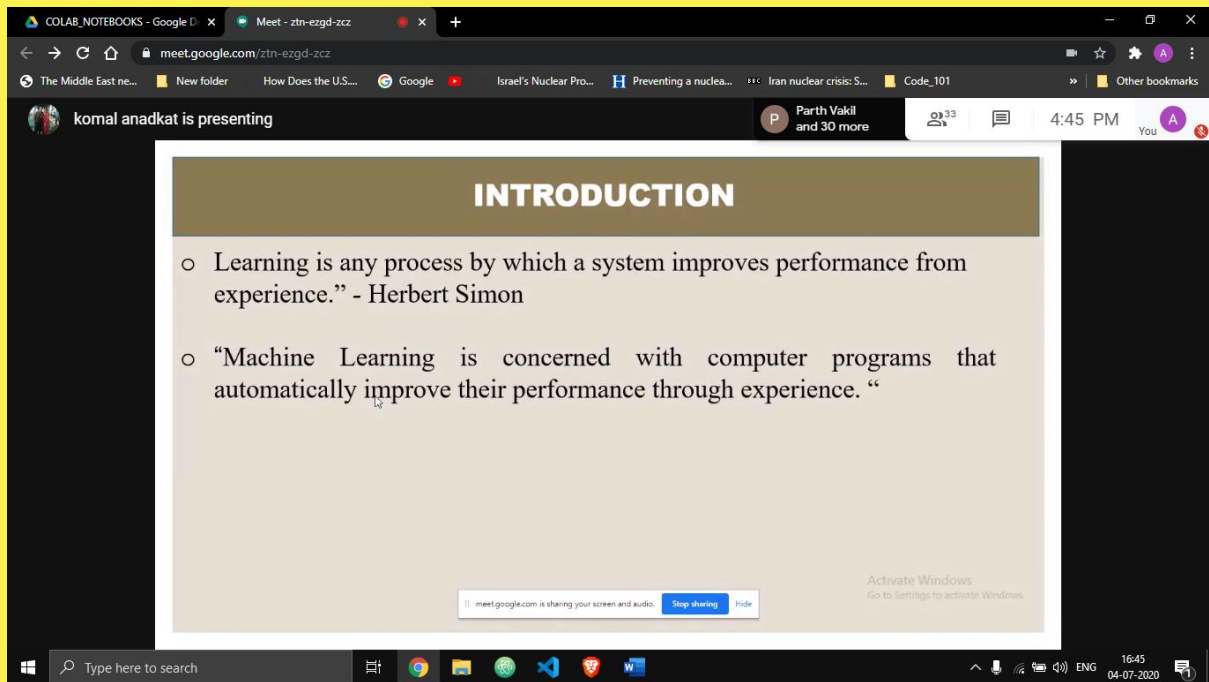




In this technologically advanced 21st century Machine learning has already become a big part of our lives as end users we are using this technology every single day . From our YouTube video recommendations to the classic "ok google" commands we are surrounded with ML and its products so it's time we get started with ML ourselves.



The meeting was scheduled to start at 4:30 however due to the interest and the punctuality of all participants the meeting commenced around 10 mins early. What followed was a quick introduction of the lecturer and a few ice breakers, we were now ready to dive into the world of ML.



**A strong foundation is the secret to a steady high rise, similarly a solid base on the basics was needed, so first an introduction to the subject**

and the day's goals were covered.

The screenshot shows a Google Meet window with a presentation titled "CONTENTS". The presentation is being shared by "komal anadkat". The content of the slide is a bulleted list:

- Introduction
- Applications
- Machine learning / Deep learning
- Supervise& and Unsupervised Learning

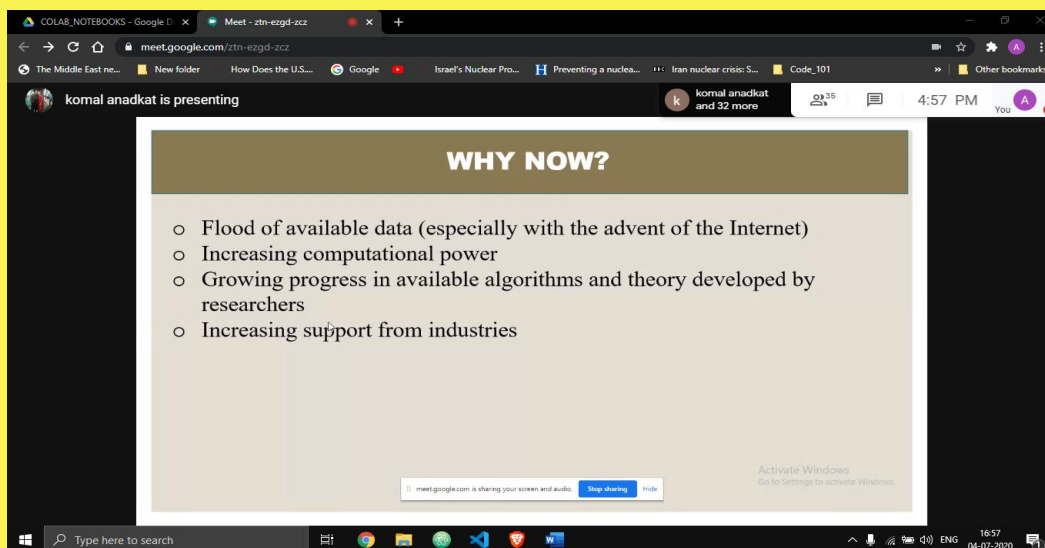
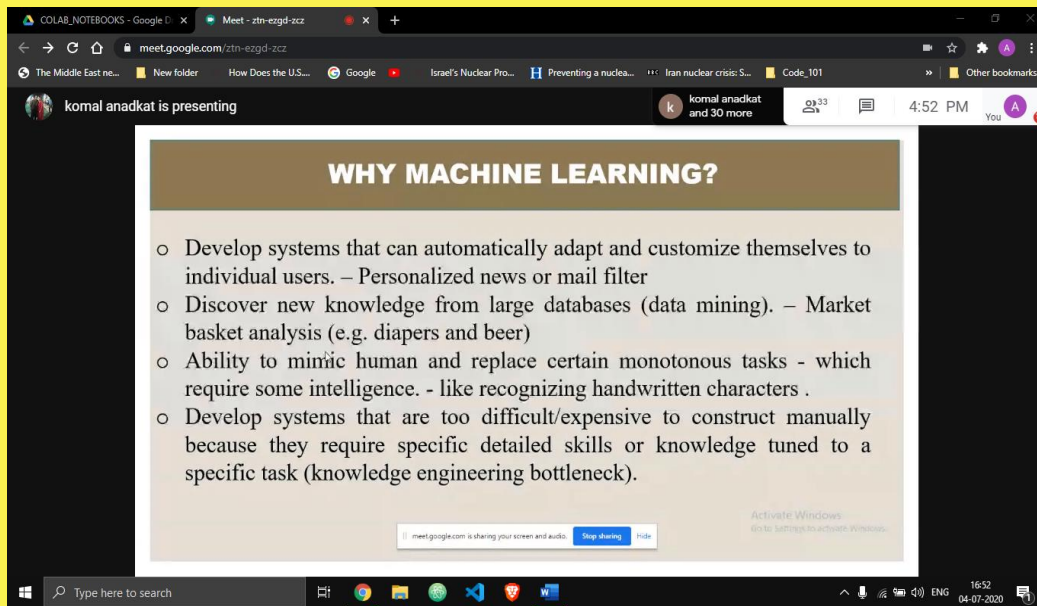
The bottom of the screen shows the Windows taskbar with the search bar and various application icons. The Meet interface includes controls for mute, video, and chat.

After establishing the basics a quick look on what, why and why now for ML followed.

The screenshot shows a Google Meet window with a presentation slide illustrating the relationship between Artificial Intelligence, Machine Learning, and Deep Learning. The slide features a Venn diagram with three overlapping circles:

- Artificial Intelligence**: Any technique that enables computers to mimic human intelligence, using logic, if-then rules, decision trees, and machine learning (including deep learning).
- Machine Learning**: A subset of AI that includes abstract statistical techniques that enable machines to improve at tasks with experience. The category includes deep learning.
- Deep Learning**: The subset of machine learning composed of algorithms that permit software to train itself to perform tasks, like speech and image recognition, by exposing multilayered neural networks to vast amounts of data.

The bottom of the screen shows the Windows taskbar and the Meet interface controls.



**Next a detailed discussion on its many applications took place. Insights on how ML actually works were also shared and some real life examples to make sure the students could relate.**

**A very important aspect of ML vs Deep Learning was covered (focusing on the various training techniques). Supervised and Unsupervised Learning were covered at length.**

COLAB\_NOTEBOOKS - Google D... Meet - ztn-ezgd-zcz

meet.google.com/ztn-ezgd-zcz

The Middle East ne... New folder How Does the U.S... Google Israel's Nuclear Pro... Preventing a nuclea... Iran nuclear crisis: S... Code

komal anadkat is presenting

# SUPERVISED LEARNING

The diagram illustrates the supervised learning workflow. It begins with 'Input Raw Data' (a cluster of multi-colored dots). This data is split into a 'Training Data set' and a 'Desired Output'. The 'Training Data set' is fed into an 'Algorithm' (represented by a person icon), which is also guided by a 'Supervisor' (person icon at a desk). The 'Algorithm' then moves to the 'Processing' stage (represented by gears). Finally, the 'Processing' stage produces the 'Output' (three distinct clusters of dots: red, green, and blue). A watermark 'Activate Windows Go to Settings to activate Windows.' is visible in the bottom right corner of the presentation slide.

Activate Windows  
Go to Settings to activate Windows.

COLAB\_NOTEBOOKS - Google D... Meet - ztn-ezgd-zcz

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The Middle East ne... New folder How Does the U.S... Google Israel's Nuclear Pro... Preventing a nuclea... Iran nuclear crisis: S... Code\_101

komal anadkat is presenting Tarang Viroja and 30 more 5:13 PM You

# UNSUPERVISED LEARNING

- When we have unclassified and unlabeled data, the system attempts to uncover patterns from the data. There is no label or target given for the examples. One common task is to group similar examples together called clustering.

The diagram illustrates the unsupervised learning workflow. It starts with 'Input Raw Data' (a cluster of multi-colored dots). This data is processed by a 'Learning Algorithm' (gears icon). The algorithm's output is then passed through 'Interpretation' (gears icon) and 'Processing' (gears icon) to produce the final 'Output' (three distinct clusters of dots: red, green, and blue). A text box above the 'Learning Algorithm' specifies 'Unknown Output' and 'No Training Data Set'. A watermark 'Activate Windows Go to Settings to activate Windows.' is visible in the bottom right corner of the presentation slide.

Activate Windows  
Go to Settings to activate Windows.

After providing the necessary theoretical introduction it was now time for some hands on practicals !.

```
Intro_to_colab.ipynb
File Edit View Insert Runtime Tools Help Last edited on 5 July

+ Code + Text

Printing out Hello World

[ ] print('hello')

hello

Printing out the time of the Virtual Machine

[ ] import time
print(time.ctime())

Fri Jul 3 16:28:41 2020

Importing NumPy Library

[ ] import numpy as np
```

```
Intro_to_colab.ipynb
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Basic plots using matplotlib

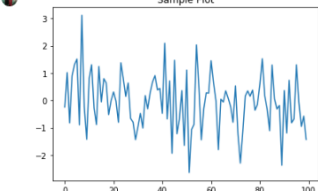
[ ] import numpy as np
from matplotlib import pyplot as plt

y = np.random.randn(100)
x = [x for x in range(len(y))]

plt.plot(x, y, '-')
plt.fill_between(x, y, 200, where = (y > 195), facecolor='g', alpha=0.6)

plt.title("Sample Plot")
plt.show()

Sample Plot
```



```
Intro_to_colab.ipynb
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Reading and working with an actual Dataset

1. using scikit , pandas seaborn and matplotlib
2. working with the dataframe

[ ] import numpy as np
import pandas as pd
import pandas.util.testing as tm

from matplotlib import pyplot as plt

import seaborn as sns

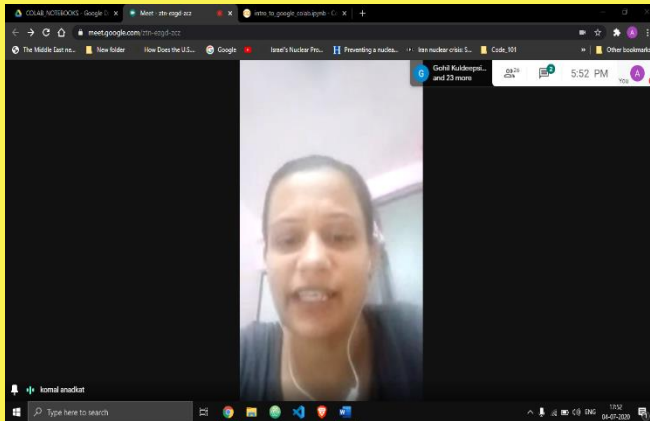
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import confusion_matrix

from joblib import dump, load
cols = ['sepal_length', 'sepal_width', 'petal_length', 'petal_width', 'class']
df = pd.read_csv('https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data', names=cols)
df.head()

#df.describe()
#sns.pairplot(df, hue='class');
#sns.heatmap(df.corr(), annot=True)

#df['class_encoded'] = df['class'].apply(lambda x: 0 if x == 'Iris-setosa' else 1 if x == 'Iris-versicolor' else 2)
#df['class_encoded'].unique()

/usr/local/lib/python3.6/dist-packages/ipykernel_launcher.py:3: FutureWarning: pandas.util.testing is deprecated. Use the functions in the public API at pandas.testing instead.
This is deprecated from the ipykernel package so you can avoid deprecation warnings until
```



After a brief explanation of the various ML techniques and a QnA session it was time to say goodbye, having given

students all the tools they need and pointing them in the right direction to get started with ML, it was indeed in many ways "Baby steps into the world of ML".

