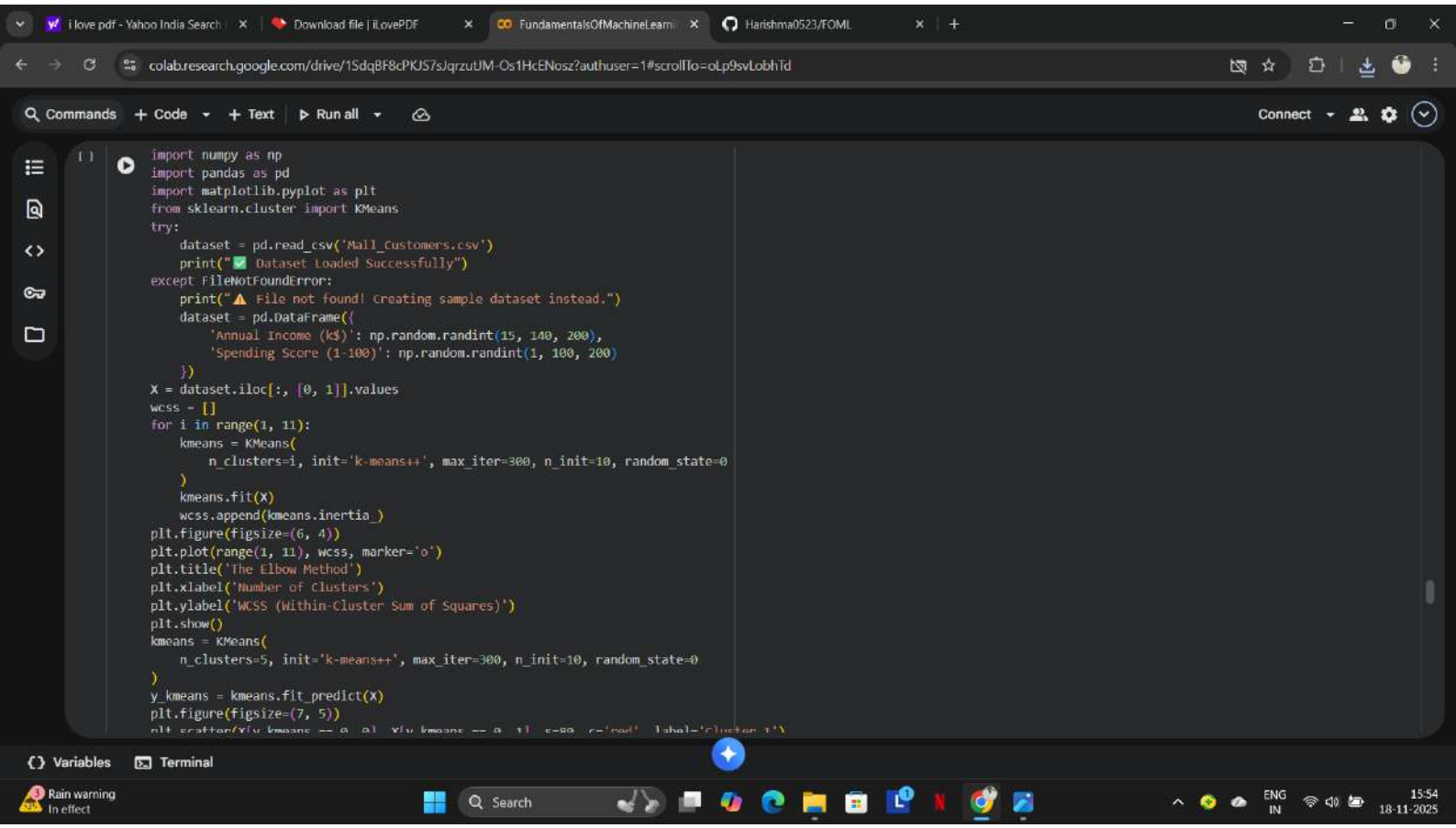
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FundamentalsOfMachineLearni
Harishma0523/FOML
colab.research.google.com/drive/1SdqBF8cPKJS7sJqrzutJM-Os1HcENosz?authuser=1#scrollTo=oLp9svLobhTd
Commands
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[ ]
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.cluster import KMeans
try:
dataset = pd.read_csv('Mall_Customers.csv')
print("✅ Dataset Loaded Successfully")
except FileNotFoundError:
print("⚠️ File not found! Creating sample dataset instead.")
dataset = pd.DataFrame({
'Annual Income (k$)': np.random.randint(15, 140, 200),
'Spending Score (1-100)': np.random.randint(1, 100, 200)
})
X = dataset.iloc[:, [0, 1]].values
wcss = []
for i in range(1, 11):
kmeans = KMeans(
n_clusters=i, init='k-means++', max_iter=300, n_init=10, random_state=0
)
kmeans.fit(X)
wcss.append(kmeans.inertia_)
plt.figure(figsize=(6, 4))
plt.plot(range(1, 11), wcss, marker='o')
plt.title('The Elbow Method')
plt.xlabel('Number of Clusters')
plt.ylabel('WCSS (Within-Cluster Sum of Squares)')
plt.show()
kmeans = KMeans(
n_clusters=5, init='k-means++', max_iter=300, n_init=10, random_state=0
)
y_kmeans = kmeans.fit_predict(X)
plt.figure(figsize=(7, 5))
Variables
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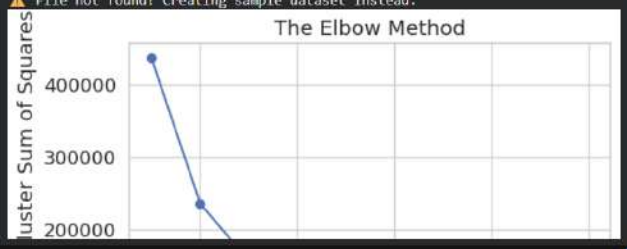
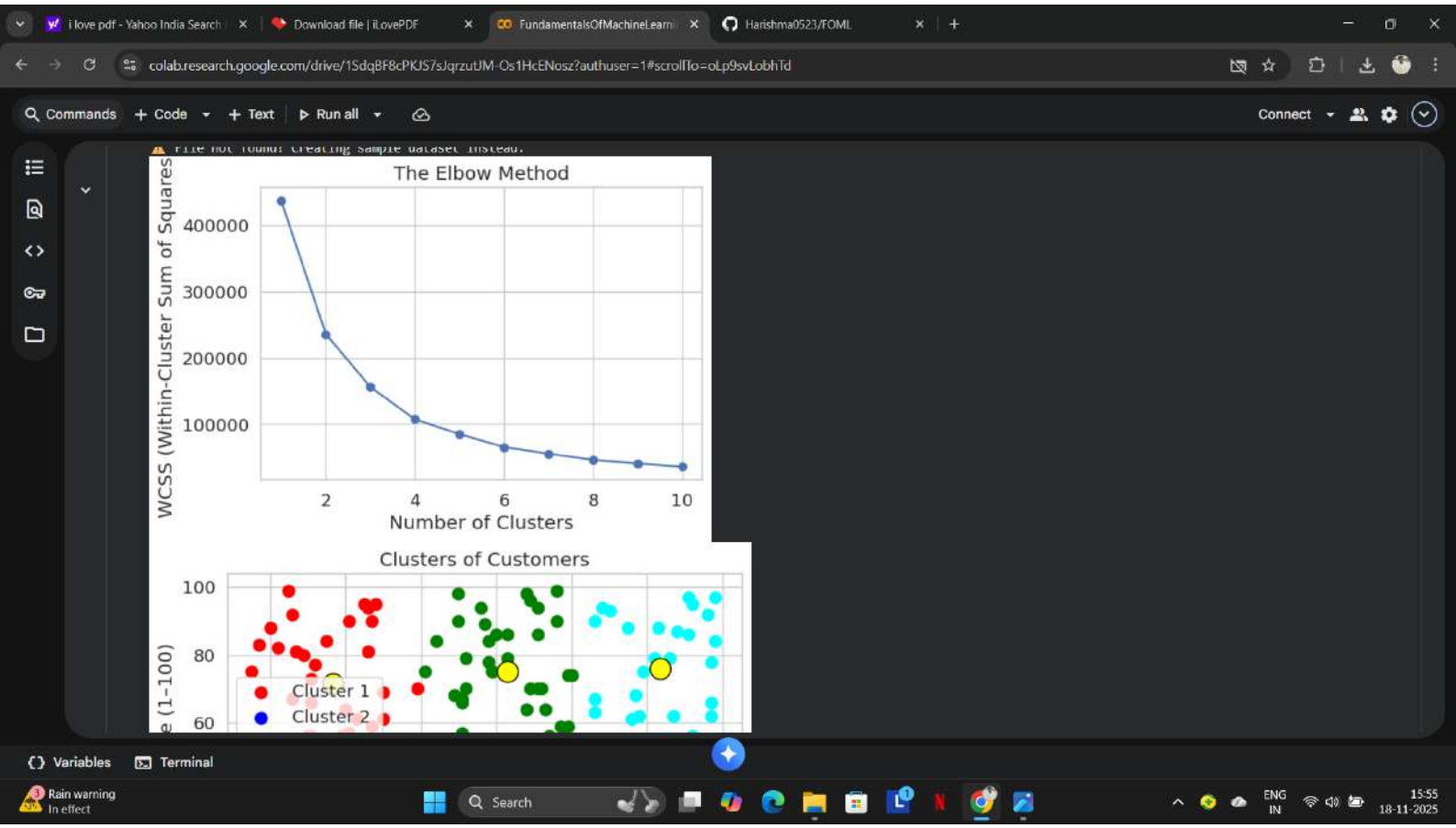
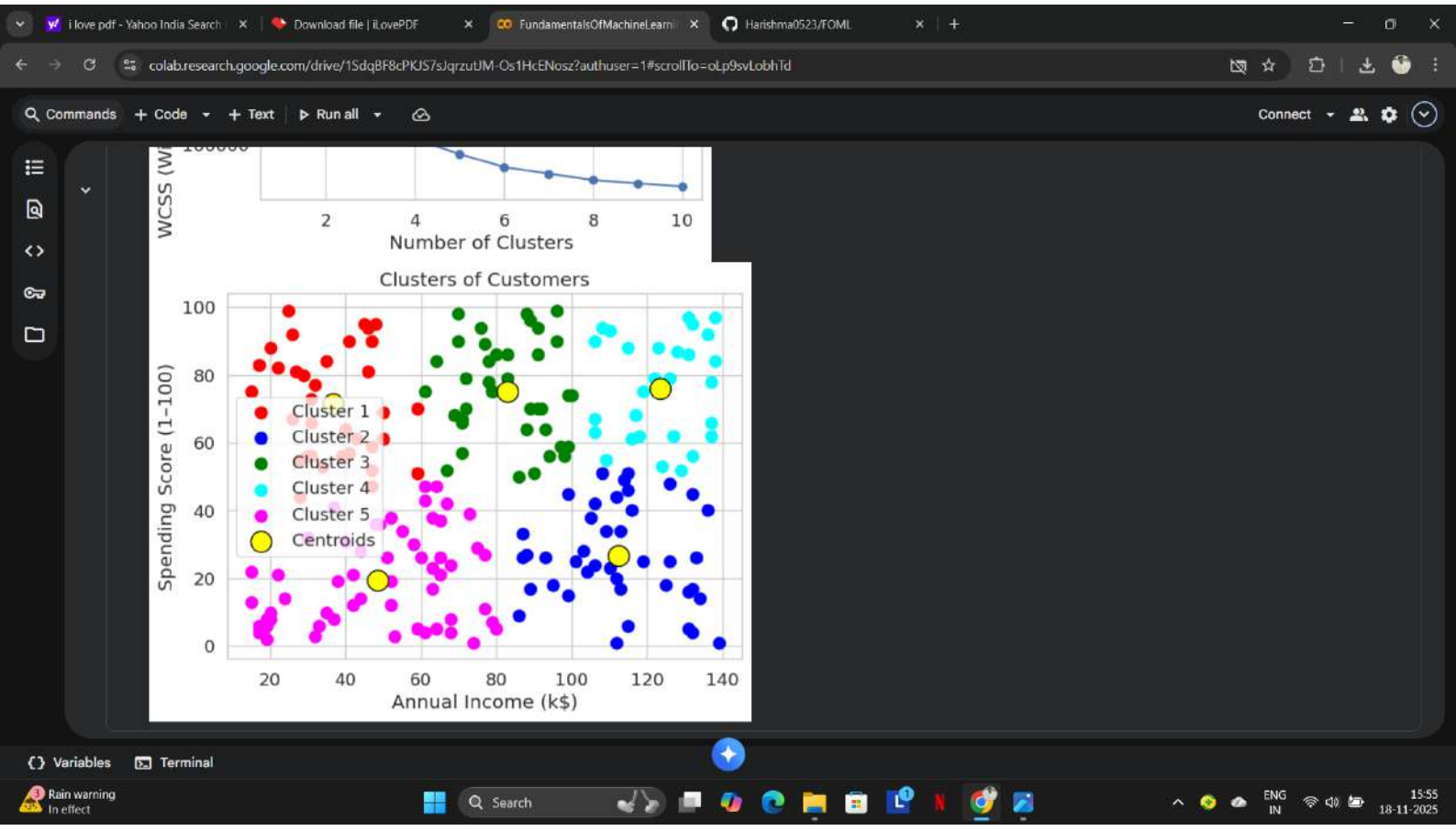
```
plt.scatter(X[y_kmeans == 0, 0], X[y_kmeans == 0, 1], s=80, c='red', label='Cluster 1')
plt.scatter(X[y_kmeans == 1, 0], X[y_kmeans == 1, 1], s=80, c='blue', label='Cluster 2')
plt.scatter(X[y_kmeans == 2, 0], X[y_kmeans == 2, 1], s=80, c='green', label='Cluster 3')
plt.scatter(X[y_kmeans == 3, 0], X[y_kmeans == 3, 1], s=80, c='cyan', label='Cluster 4')
plt.scatter(X[y_kmeans == 4, 0], X[y_kmeans == 4, 1], s=80, c='magenta', label='Cluster 5')
plt.scatter(
    kmeans.cluster_centers_[:, 0],
    kmeans.cluster_centers_[:, 1],
    s=250,
    c='yellow',
    edgecolor='black',
    label='Centroids'
)
plt.title('Clusters of Customers')
plt.xlabel('Annual Income (k$)')
plt.ylabel('Spending Score (1-100)')
plt.legend()
plt.show()
```

```
⚠ File not found! Creating sample dataset instead.
```




File not found. Creating sample dataset instead.
The Elbow Method
WCSS (Within-Cluster Sum of Squares)
400000
300000
200000
100000
2
4
6
8
10
Number of Clusters
Clusters of Customers
100
80
60
Cluster 1
Cluster 2


WCSS (W
2
4
6
8
10
Number of Clusters
Clusters of Customers
Spending Score (1-100)
100
80
60
40
20
0
Cluster 1
Cluster 2
Cluster 3
Cluster 4
Cluster 5
Centroids
20
40
60
80
100
120
140
Annual Income (k$)