If the space provided for an answer is not sufficient, please continue on the back or attach an additional sheet.

Name: .....

Term: ..... **Subject:** ..... **Machine Learning** .....

Teacher: A. Mhamdi

Do not write in this table.

Question:	1	2	3	4	5	6	7	8	9	10	Total
Points:	1	1	1	1	1	1	1	1	1	1	10
Score:											

1. (1 point) Import the librairies

[1]:
```
```

2. (1 point) Load the *Mall_Customers* dataset. Assign it to *df*.

[2]:
```
```

3. (1 point) Check the dataframe's first five observations.

[3]:
```
```

[3]:

	CustomerID	Genre	Age	Annual Income (k$)	Spending Score (1-100)
0	1	Male	19	15	39
1	2	Male	21	15	81
2	3	Female	20	16	6
3	4	Female	23	16	77
4	5	Female	31	17	40

4. (1 point) Explain what does the cell below do to *df*.

[4]:
```
df.rename(columns={'Annual Income (k$)': 'Income', 'Spending Score (1-100)':␣
↪'Spending Score'}, inplace=True)
```

.....

.....

5. (1 point) What code to use in order to get useful insights from data?

[5]:

6. (1 point) Import the `cluster` class from the `sklearn` library.

[6]:

7. (1 point) Perform **K-Means** Clustering with 5 clusters. Specify the `init` method.

[7]:

8. (1 point) Apply the cluster using only the two variables: *Spending Score* & *Income*

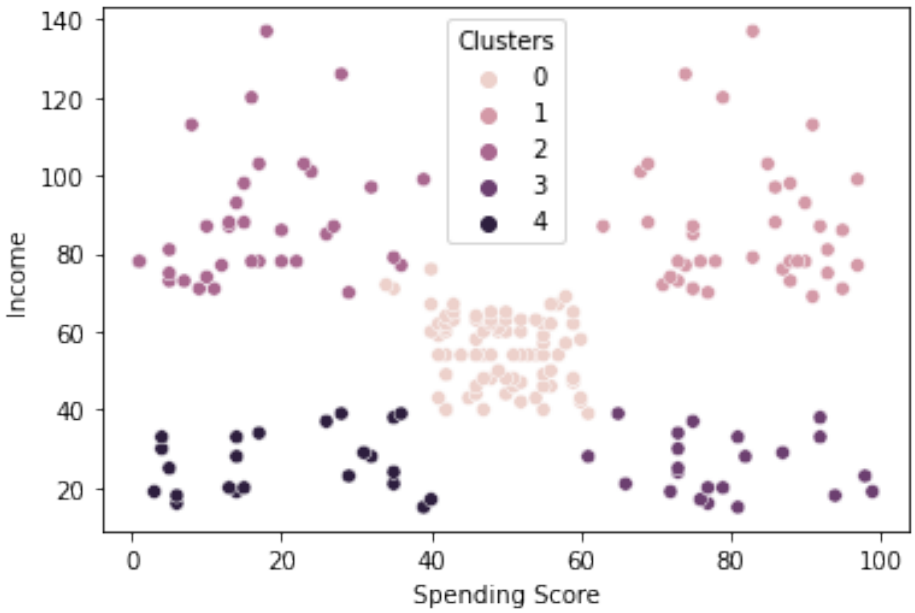
[8]:

9. (1 point) Display the coordinates of the centroids.

[9]:

10. (1 point) Without running the cell below, explain what does it do.

[10]:
```
import seaborn as sns
sns.scatterplot(x="Spending Score", y="Income", hue='Clusters',  data=df)
```



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