



## RFM Model and its Application

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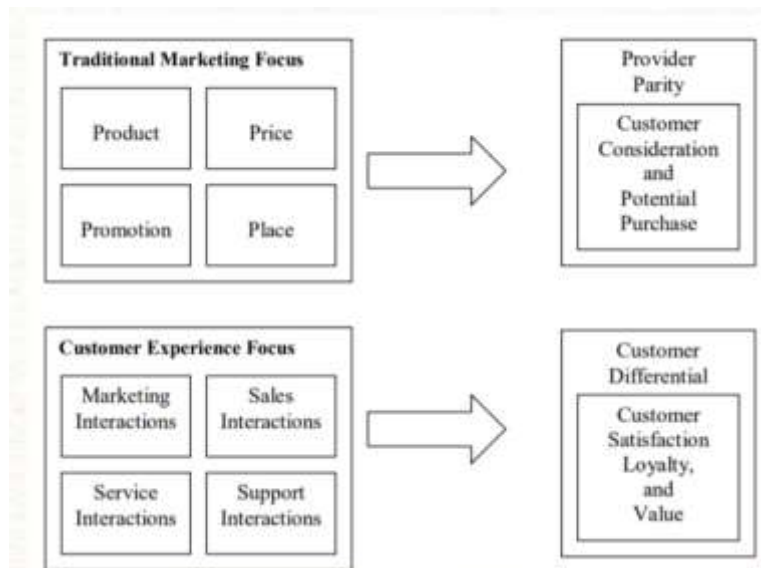
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### ABSTRACT

Customer Relationship Management is a process that addresses all aspects of identifying customers, creating customer knowledge, building customer relationships, and shaping their perceptions of the organization and its products. CRM is an IT enabled business strategy, the outcomes of which optimise profitability, revenue and customer satisfaction by organising around customer segments, fostering customer satisfying behaviours and implementing customer-centric processes-Gartner Group. CRM is not just a process but a business strategy. Under lying strategy is to form long-term mutually beneficial relationship with customers. It results in to tearing down the walls between organization and customers. Customer and company move closer to each other. CRM is not just an IT strategy; it is a business strategy affecting the organization as a whole. Many companies use CRM to increase efficiency and reliability. Ex. Self-service. As a business strategy, CRM's goal is customer-intimacy. Elements of CRM are: 1) Customer Knowledge, 2) Relationship Strategy, 3) Communication, 4) The individual Value Proposition.

CRM in its broadest sense means managing all interactions and businesses with customers.



RFM plays a very crucial role in customer relationship management. What does RFM means, according to full form, RFM is Recency Frequency Monetary value. But if we go deeper, RFM tells the behaviour pattern of consumer or customer which helps the companies or organisations for better understanding towards their customer. Mostly service-based companies and product-based companies use this RFM model to identify their customer, segment it and then predict their behaviours and on the basis of their predicted behaviour, companies make their customized strategy according to each and every customer. For an example, there are two one person, one is vegetarian and other one is non vegetarian, so with the help of RFM Model, company has known that one is veg. and another one non veg. and then any food delivery company send their customised notifications, texts, emails according to the customer choice.

### Customer-Supplier Relationship

The word relationship gives an idea or thought of the feeling that the two people who are in relationship have some bond for each other, have feelings for each other, they have mutual attraction between them, they respect each other, they obey others like and dislike, they have dependency on each other.

But for a relationship to exist, there are some/certain conditions which should have. (A) For a relationship to exist, there must be interactions at least between two parties and more than two also; so, the activity of one party should influence or affect other party and vice versa also. (B) relationship does not mean that two parties meet once say hi hello, this does not call relationship, so there must be continuity present between the parties, continuity of interactions for a long period of time. (C) Actually, occurring occurrences and the personal interpretations of these events dictate the effects of interactions.

So, generally there are two types of relationships exists: Primary relationship and Secondary relationship. The first category of relationships encompasses important, long-term interpersonal ties that are predominantly driven by feelings of obligation and emotional ties. In contradiction to secondary acquaintances, primary relationships—like a romantic relationship between two people—are more diffuse and involve a variety of roles, behaviors, and circumstances. They are typically unrestricted by severe regulations on communication, and the parties involved are typically very well acquainted. One individual in a major connection cannot be easily replaced by another. In contrast, secondary relationships—like those between a consumer and a supplier—are characterized by a limited amount of social interaction, fairly explicit etiquette guidelines, and generally well-defined social positions. Unlike in primary relationships, there is seldom any sort of substantial emotional involvement; In general, it might be easier to replace the different players. Large participation is uncommon in the transitional space between secondary and primary relationships. Below showing the diagram of Pyramid of Relationship.

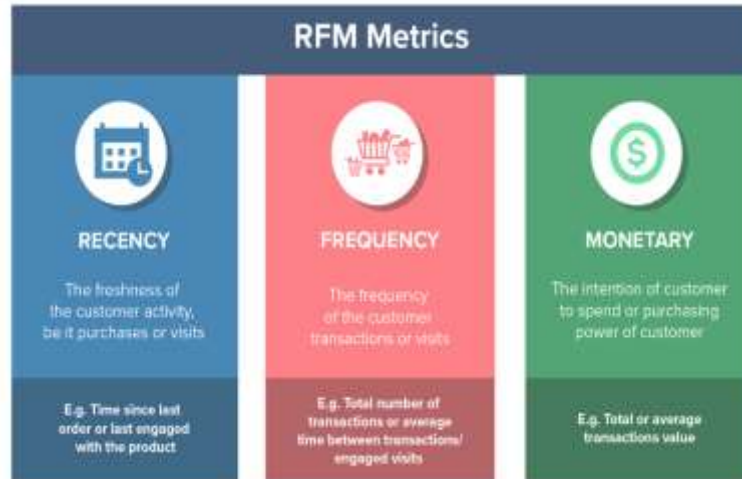


It is important to understand the relationship between consumer and company, either there is relationship exists or not. Or it's primary relationship or secondary relationship. And for understand the relationship between customer and organisation, RFM analysis is used.

## RFM MODEL

RFM Analysis is a very important concept that comes under CRM/E-CRM. The major goal of a company, organisation, CRM, E-CRM, RFM is: (1) Customer Selection, (2) Customer Acquisition, (3) Customer Retention, (4) Customer Extension. The benefits of E-CRM include: Reducing costs in customer targeting (customizing emails on large scale therefore reducing costs for direct mail), Service level improvements, Revenue growth, Productivity, Customer satisfaction.

The "RFM" in RFM analysis stands for recency, frequency and monetary value. RFM analysis is a way to use data based on existing customer behaviour to predict how a new customer is likely to act in the future. An RFM model is built using three key factors: how recently a customer has transacted with a brand. RFM is widely used for customisation which includes customer relationship management and direct marketing. Company has database which has each and every data of customer which helps the company to make RFM model, on the basis of RFM Model companies make segments of different customers which helps companies for customisation. Now understand the meaning of recency, frequency and monetary. (1) R (Recency): the period since the last purchase; a lower value corresponds to a higher probability of the customer's making a repeat purchase; (2) F (Frequency): number of purchases made within a certain period; higher frequency indicates greater loyalty; (3) M (Monetary): the money spent during a certain period; a higher value indicates that the company should focus more on that customer. This helps the companies to identify the customer's perspective related to which product, which brand, at what time, their loyalty and many other parameters. But this RFM value also depends on the product. For example, electronic gadgets: phone, refrigerator, television etc, these things are not related to some like there is high frequency. The value in RFM which plays crucial role in electronic gadgets is Monetary. So that is why there is new concept evolve which is called WRFM Model: Weighted RFM Model. In these three values: recency, frequency and monetary, which has more weighted related to a particular product or business line or service. Let's understand the RFM Model in a nutshell with the help of this diagram which shows the meaning of recency, frequency and monetary with the help of example.



Since companies are surviving in a highly competitive environment, so it's very important to identify potential candidates in terms of either recency or frequency or monetary and on board them. RFM Model helps to identify potential customer and then make customised strategy and marketing strategy for them for gaining their loyalty, retention and profitability. Since not all customers are important in terms of money value, so make strategy according to that. Who are not loyal, make them loyal. Who are not retain, make them retain. Who are not profitable, make them profitable. And how you all of these things you know about your customer, with the help of customer segment which is done by RFM Model. Categorisation or segmentations of customers are done by on the basis of their traits (geographic, demographic, and psychographic factors) and behaviours (attitudes toward the product and how they react to the benefit, circumstance, and brand).

### Predictive Segments (RFM)



#### Individualized

#### Customer Proposition

Individualized Customer Proposition means giving priority, an extra edge to each and every profitable customer. How is this to be done: with the help of customisation? Customisation is a term which means giving product to the customer according to his/her choice, a modified version of product and this modification has done on the basis of customer's instructions or customer's nature/behaviour/like/dislike/pattern. Customisation helps for one-to-one marketing and strategy. In customisation, organisation see customer as a single entity rather than the whole dataset or crowd. Customisation basically helps or give opportunity to the customer that the product will made according to them so that they would enjoy. This customisation strategy illustrate that the companies identify their loyal customers, profitable customers, loss making customers and various other customers. But there are certain problems with customisations: (1) Complexity in company processes, (2) Adaptation required for the offered products or services, (3) Unreliability and inefficiency. There are various approaches for product customisation. Gilmore and Pine gave 4 distinct approaches to product customisation (these approaches are done on the basis of based on the manner in which customers make their wishes explicit/clearly to suppliers).



-Cosmetic Customisation: Cosmetic customization merely modifies the product's appearance (representation) in a straightforward way. Cosmetic customization does not involve any more product adaption beyond what is represented. This strategy works well when consumers utilize the product in identical ways and the manner it is presented varies the most. For instance, the recommended usage on the packaging for Pantene shampoo varies depending on the nation in which it is sold.

-Transparent customisation: Neither the depiction of product, but the item in question itself is modified through transparent customization. This implies that certain parts of the product may have the same external design or look as the rest. Transparent customization gives clients specialized goods and services without disclosing to them that the goods were made just for them. To create its own materials, the company collects data from a wide range of sources. The above technique works best when it is possible to identify and predict the demands of the customers from behaviour observation, which does not require a personal connection with the customers.

-Collaborative customisation: Collaborative customization responds to the function of the product as well as to representation. Businesses that choose for collaborative customization typically stay in touch with their clients to gather insights about their unique requirements and desires. The business thus tailors its product offering to each customer's wants and specifications without having to manufacture them beforehand. Only after the company receives requests from customers will the product be produced. This method works well when clients find it difficult to express what they desire. For instance, the eyewear retailer Paris Miki created a digital platform that offers clients guidance while selecting a frame. Although fewer complete products need to be maintained in stock, the expenses are reduced.

-Adaptive customisation: Adaptive customization does not change to fit the depiction or the product. An organization, on the other hand, provides a single standard product that is made for consumers to customize to their own specifications. Customers that are searching for a product that can be customized to serve different objectives under different circumstances can benefit from this customization. As an illustration, the lighting system designer Lutron Electronics Company lets clients select from pre-programmed lighting options. The consumer can select two distinct lighting options: one for romantic dinner lighting and another for reading illumination. Ikea sells unfinished kitchen table sets and gives consumers the choice to paint them themselves or to choose from a variety of paint colors before painting them.

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## RFM MODEL scoring

Generally, there are two very popular methods which are use for scoring of RFM Model. First one is Customer Quintile Method and second one is Behaviour Quintile Scoring Method. In customer quintile method, customers are categorised on the basis of their behaviour. Here rank is allotted to the customers based on their performance related to recency, frequency and monetary values. Raking of customers is done in such a fashion from best to worst in descending order. Sort the database first according to each RFM dimension, followed by divide the client list into five equal sections. Numbers are allotted to the customers on the basis of their RFM. This goes from best to worst which means 5 to 1. 5 is allotted to the best customer and 1 is allotted to the worst customer. And hence there is formation of cell which contains value of RFM in terms of 1,2,3. For recency, 5 is allotted to that customer which has least value of recency for a particular period of time, least recency means customer has visited our organisation very soon and hence best customer and allotted to score 5 and vice versa. For frequency, 5 is allotted to that customer which has maximum value of frequency for a particular period of time. More frequency means our customer has visited our organisation many times and hence best customer and allotted to score 5 and vice versa. For monetary, which customer has spent more money has allotted 5 score and vice versa. Example of scores is (555), (111), (523), (425) etc. Let's understand three examples: (555), (111), (514). (555) means best customer who has minimum value of recency which means our customer visits our company daily and his frequency is high, he purchases our product or uses our service very frequently and has maximum monetary value, which means customer spend good amount of money. (111) means worst customer who visited our company occasionally and his frequency is very low and monetary is also low

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## THE APPLICATION OF THE RFM MODEL

RFM Model is widely use for customer segmentation and to find CLV (Customer Lifetime value).

Here we have coding of Customer Segmentation Analysis using Python coding language in Jupyter Notebook.

After Customer Segmentation Analysis, we can apply RFM Model. Customer Segmentation Analysis using unsupervised machine learning, in which K-Means Clustering Algorithm.

Customer segmentation is the problem of uncovering information about a firm's customer base, based on their interactions with the business. In most cases this interaction is in terms of their purchase behaviour and patterns. We explore some of the ways in which this can be used.

You own the mall and want to understand the customers like who can be easily converge [Target Customers] so that the sense can be given to marketing team and plan the strategy accordingly.

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

data = pd.read_csv(r"Mall_Customers.csv")

data.head()

data.shape

data.describe()

data.info()

data.isnull().sum()

data.columns

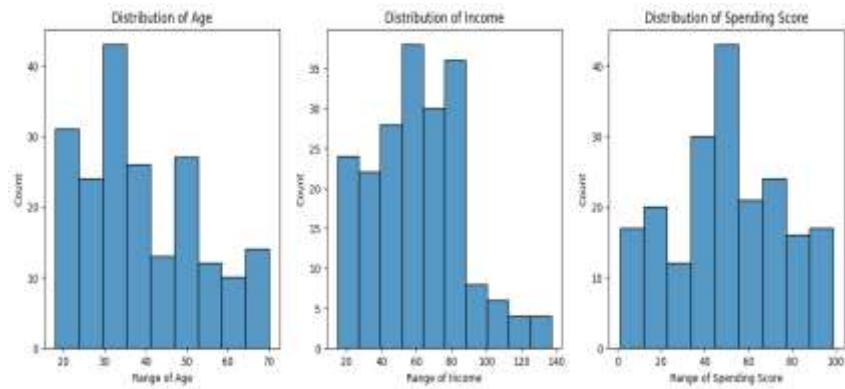
plt.figure(figsize = (16,5))

plt.subplot(1, 3, 1) #(1,3,1)= 1= ek hi row m, 3=3 column chahiye, 1= abhi ye phla graph h
sns.histplot(data['Age'])
plt.title("Distribution of Age")
plt.xlabel("Range of Age")
plt.ylabel("Count")

plt.subplot(1, 3, 2)
sns.histplot(data['Annual Income (k$)'])
plt.title("Distribution of Income")
plt.xlabel("Range of Income")
plt.ylabel("Count")

plt.subplot(1, 3, 3)
sns.histplot(data['Spending Score (1-100)'])
plt.title("Distribution of Spending Score")
plt.xlabel("Range of Spending Score")
plt.ylabel("Count")

plt.show()
```

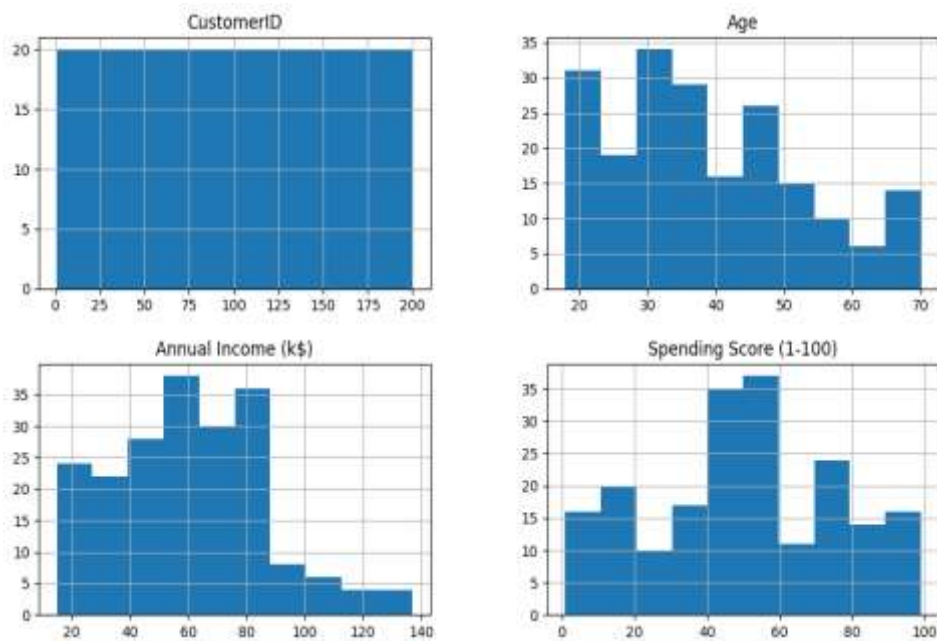


```
df = data.groupby('Genre').size()
```

```
df.plot(kind='pie', subplots = True,
        colors = ['lightgreen', 'orange'],
        explode = [0, 0.001],
        labels = ['Female', 'Male'],
        autopct = '%.2f%%')
plt.title("Gender Distribution")
plt.ylabel("")
plt.show()
```

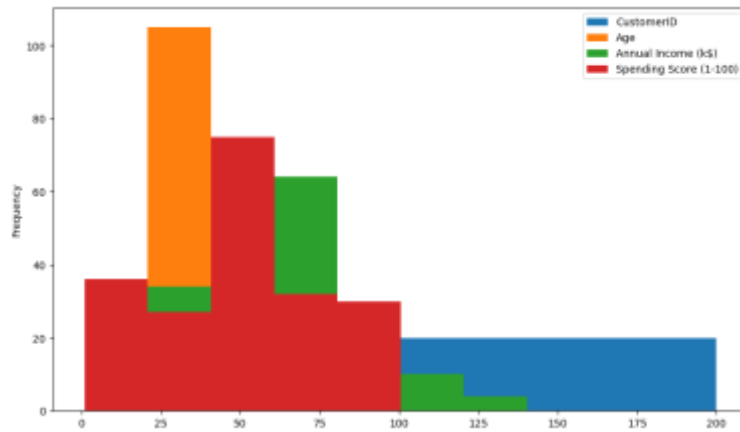
```
data.hist(figsize = (12, 7))
```

```
plt.show()
```



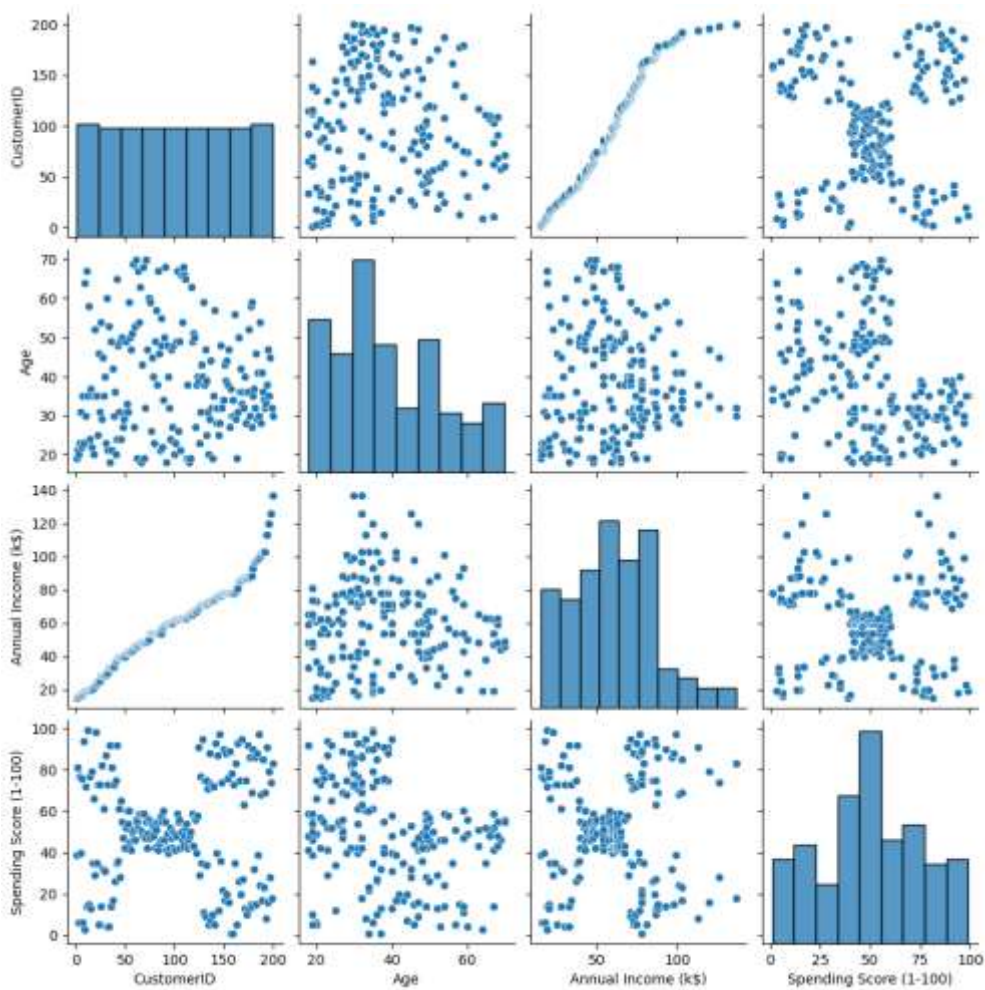
```
data.plot.hist(figsize = (12, 7))
```

```
plt.show()
```



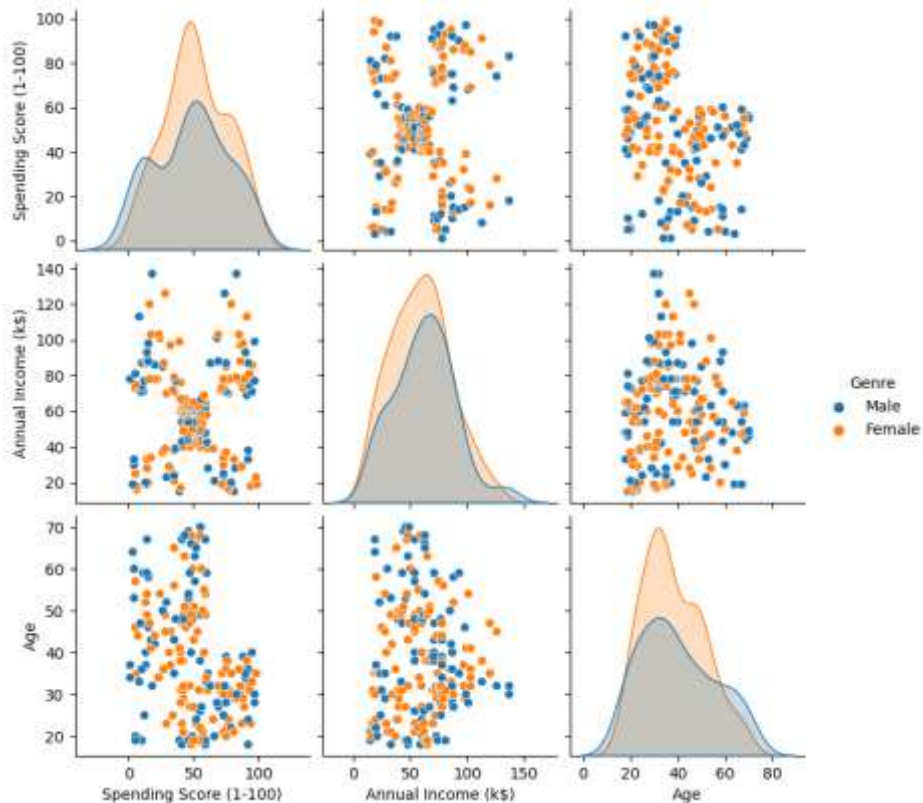
```
sns.pairplot(data)
```

```
plt.show()
```



```
sns.pairplot(data, vars = ['Spending Score (1-100)', 'Annual Income (k$)', 'Age'],
```

```
hue = 'Genre')
```



```
x = data.iloc[:, [3,4]].values # [3,4]= Annual Income (k$) and 'Spending Score (1-100)'
```

```
k = [] # define empty list
```

```
for i in range(1, 11):
```

```
    kmeans = KMeans(n_clusters = i, init = 'k-means++', random_state = 0)
```

```
    kmeans.fit(x)
```

```
    k.append(kmeans.inertia_)
```

```
plt.plot(range(1, 11), k)
```

```
plt.show() #This method is called elbow method
```

```
model = KMeans(n_clusters = 5, init = 'k-means++', random_state = 0)
```

```
y_kmeans = model.fit_predict(x)
```

```
plt.figure(1, figsize = (15, 8))
```

```
plt.scatter(x[y_kmeans == 0, 0], x[y_kmeans == 0, 1], s=100, c = 'magenta', label = 'Cluster 1') ### Cluster 1
```

```
plt.scatter(x[y_kmeans == 1, 0], x[y_kmeans == 1, 1], s=100, c = 'blue', label = 'Cluster 2') ### Cluster 2
```

```
plt.scatter(x[y_kmeans == 2, 0], x[y_kmeans == 2, 1], s=100, c = 'cyan', label = 'Cluster 3') ### Cluster 1
```

```
plt.scatter(x[y_kmeans == 3, 0], x[y_kmeans == 3, 1], s=100, c = 'green', label = 'Cluster 4') ### Cluster 1
```

```
plt.scatter(x[y_kmeans == 4, 0], x[y_kmeans == 4, 1], s=100, c = 'red', label = 'Cluster 5') ### Cluster 1
```

```
plt.scatter(kmeans.cluster_centers_[:, 0], kmeans.cluster_centers_[:, 1], s = 200, c = 'black', label = 'Centroids')
```

```
plt.title('K Means Clustering Algorithm')
```

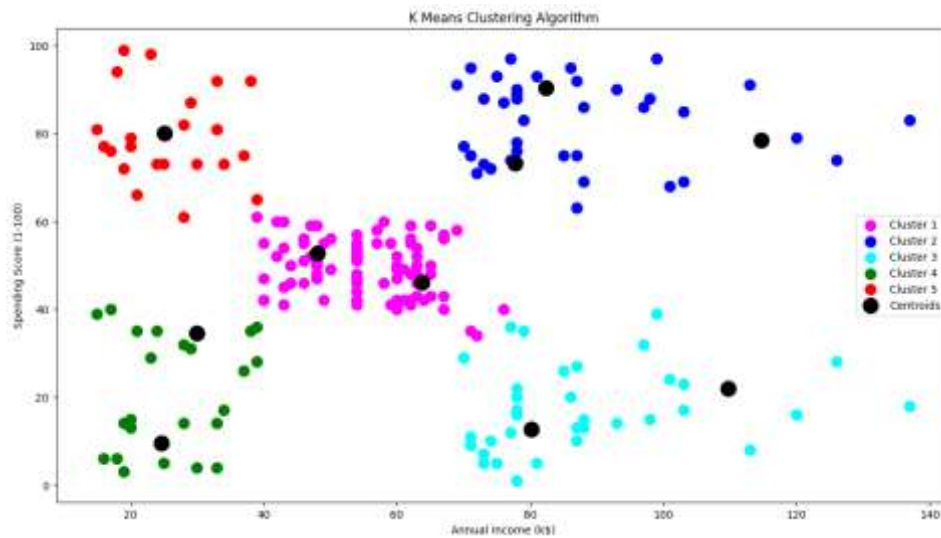
```
plt.xlabel('Annual Income (k$)')
```

```
plt.ylabel('Spending Score (1-100)')
```

```
plt.legend()
```



plt.show()



## Conclusion

Customer Relationship Management is a very integral part of organisation which mainly talks about customer segmentation, customer acquisition, customer retention and customer extension. Customer retention happens with customer loyalty. Customer loyalty happens when customer get their product or service according to their wish. And they get their desired product when organisation has information about each and every individual single customer. And this is done with the help of RFM Analysis.

## References

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