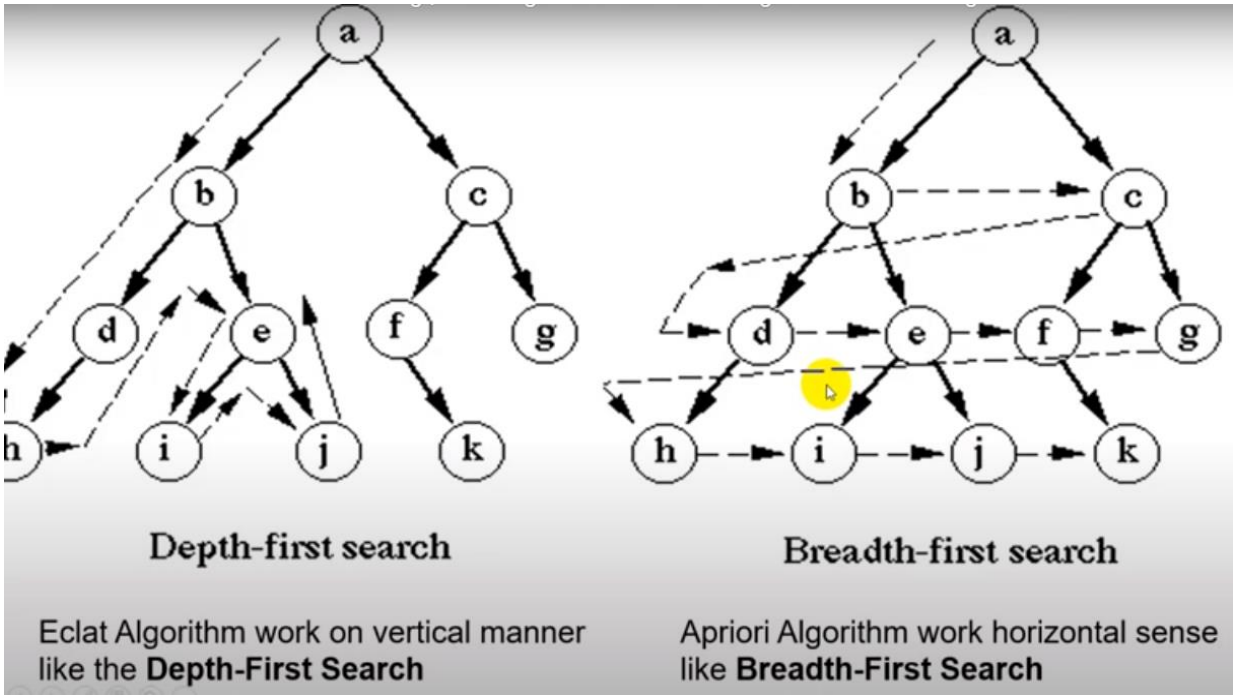
Team 8
Eclat Algorithm

- The **ECLAT algorithm** stands for **Equivalence Class Clustering and bottom-up Lattice Traversal.**
- It is an algorithm for finding **frequent item sets** in a transaction or database.
- It is one of the popular methods of **Association Rule mining**.
- Eclat algorithm uses a Depth first search for discovering frequent item sets.
- It is an algorithm for finding frequent item sets in a transaction or database. It is one of the best methods of Association Rule Learning

Difference b/w DFS and BFS



- It represents the data in vertical manner unlike Apriori algorithm which represents data in horizontal pattern. This vertical pattern of **Eclat algorithm** making it into faster algorithm compared to Apriori algorithm. Hence, Eclat algorithm is more efficient and scalable version of the Association Rule Learning.

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Implementation of Eclat Algorithm using python

Importing Libraries:

The first step, as always, is to import the required libraries. Execute the following script to do so

```
In [3]: import numpy as np
        import matplotlib.pyplot as plt
        import pandas as pd
        from apyori import apriori
```

Importing the Dataset:

Now let's import the dataset and see what we're working with. Download the dataset and place it in the "Datasets" folder of the “C" drive (or change the code below to match the path of the file on your computer) and execute the following script:

```
In [2]: df=pd.read_excel("C:/Users/Deepa Ankit/Documents/4th sem/final-again.xlsx")
        df
```

DataSet:

https://drive.google.com/file/d/1pG9cz4Y2jK_WO68i6RCM9qrx7MDclLlM/view?usp=sharing

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Out[5]:

	School performance till 10th	Percentage in 10th,11th /I pu,12th/2nd pu	Average CGPA in Engineering.	Where were you brought up,	Father Occupation.	Father Qualification.	Mother Occupation.	Mother qualification.	Annual Income(Family).	Are you staying away from parents.	...	Where you want to work.	Favorite subject in engineering.
0	School(>75)	PUC(>80)	CGPA(7-6)	Village	self	< Class 12	housewife	< Class 12	(<4,00,000)	Away from Parents -No	...	India	Maths
1	School(>75)	PUC(>80)	CGPA(>8)	City	govt	Masters	housewife	Graduate	(8,00,000-15,00,000)	Away from Parents -No	...	India	Civil
2	School(60-75)	PUC(60-80))	CGPA(7-6)	City	job	Masters	job	Graduate	(4,00,000-8,00,000)	Away from Parents -Yes	...	Foreign	Maths
3	School(60-75)	PUC(60-80))	CGPA(7-6)	City	business	Graduate	housewife	Graduate	(<4,00,000)	Away from Parents -Yes	...	Foreign	theory
4	School(>75)	PUC(>80)	CGPA(>8)	City	job	Graduate	housewife	< Class 12	(<4,00,000)	Away from Parents -No	...	Foreign	Electronics

5 rows × 112 columns

Data Proprocessing:

- The Apriori library we are going to use requires our dataset to be in the form of a list of lists, where the whole dataset is a big list and each transaction in the dataset is an inner list within the outer big list. Currently we have data in the form of a pandas dataframe. To convert our pandas dataframe into a list of lists, execute the following script:

In [7]:
```
placement_list = []
for i in range(0, df.shape[0]):
  placement_list.append([str(df.values[i,j]) for j in range(0, df.shape[1])])
```

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Placement(list):

```
In [9]: placement_list
Out[9]: [['School(>75)',
          'PUC(>80)',
          'CGPA(7-6)',
          'Village',
          'self',
          '< Class 12',
          'housewife',
          '< Class 12',
          '(<4,00,000)',
          'Away from Parents -No',
          'Joint Family',
          'In house work',
          'Sometimes',
          'Normal',
          'Group Study',
          'Prefer - Passion',
          'Travelling time(0-20)',
          'Group Trip',
          'Bed',
          'Nothing',
```

Applying Eclat:

- The next step is to apply the Eclat algorithm on the dataset. To do so, we can use the apriori class that we imported from the apyori library.
- The apriori class requires some parameter values to work. The first parameter is the list of list that you want to extract rules from. The second parameter is the min_support parameter. This parameter is used to select the items with support values greater than the value specified by the parameter.

```
In [10]: from apyori import apriori
         association_rules = apriori(transactions = placement_list, min_support = 0.01, min_confidence = 0.3, min_length = 3,max_length =
```

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Viewing the Association Results:

```
In [ ]: results=list(association_rules)
```

```
In [15]: results
```

```
Out[15]: [RelationRecord(items=frozenset({'(8,00,000-15,00,000)', 'National'}), support=0.009735744089012517, ordered_statistics=[OrderedStatistic(items_base=frozenset({'National'}), items_add=frozenset({'(8,00,000-15,00,000)'}), confidence=0.3684210526315789, lift=5.297894736842105)]),
 RelationRecord(items=frozenset({'(>40)mins', 'National'}), support=0.008344923504867872, ordered_statistics=[OrderedStatistic(items_base=frozenset({'National'}), items_add=frozenset({'(>40)mins'}), confidence=0.3157894736842105, lift=4.730263157894736)]),
 RelationRecord(items=frozenset({'(>40)mins', 'defence'}), support=0.005563282336578581, ordered_statistics=[OrderedStatistic(items_base=frozenset({'defence'}), items_add=frozenset({'(>40)mins'}), confidence=0.30769230769230765, lift=4.608974358974359)]),
 RelationRecord(items=frozenset({'Masters', 'School(<60)'}), support=0.005563282336578581, ordered_statistics=[OrderedStatistic(items_base=frozenset({'School(<60)'}), items_add=frozenset({'Masters'}), confidence=0.39999999999999997, lift=4.168115942028985)]),
 RelationRecord(items=frozenset({'Self Defence (ex Karate)', 'National'}), support=0.008344923504867872, ordered_statistics=[OrderedStatistic(items_base=frozenset({'National'}), items_add=frozenset({'Self Defence (ex Karate)'}), confidence=0.3157894736842105, lift=4.541052631578947)]),
 RelationRecord(items=frozenset({'Sport(>7)', 'National'}), support=0.009735744089012517, ordered_statistics=[OrderedStatistic(items_base=frozenset({'National'}), items_add=frozenset({'Sport(>7)'}), confidence=0.3684210526315789, lift=4.6472760849492145)]),
 RelationRecord(items=frozenset({'sports', 'National'}), support=0.012517385257301807, ordered_statistics=[OrderedStatistic(items_base=frozenset({'National'}), items_add=frozenset({'sports'}), confidence=0.4736842105263157 6, lift=4.60241820768136
```

Viewing the Results to Excel Sheet:

Printing the frozenset result in excel file .

https://drive.google.com/file/d/1HULV4OTUzgmz30xaxWeCSFkF_2_E2408/view?usp=sharing

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Conclusion:

Association rule mining algorithms such as Eclat are very useful for finding simple associations between our data items.