

How to execute the code:

We have created an abstract class named “periodicPatterns” inside the “abstractPeriodicPatterns.py” python file. Therefore, every program has to import this file and needs to extend the abstract class as follows:

- *from traditional.abstractClass.abstractPeriodicPatterns import **
- *class ptubes():*
 - *Complete code along with the implementation of the given abstract methods.*

1. Periodic Frequent Pattern Mining (PFPM) Process:

1.1.Import our package and initialize the method called '**periodic-TubeS**' using the input file path/input file, minimum support, and maximum period (It has to be given in terms of count of total number of transactions in the input database/file).

1.2.Then call the method '**startMine**' using the following command

```
import ptubes as Myap  
fp= Myap.Ptubes()  
fp.iFile = “file name”  
fp.minSup = minimum support  
fp.maxper = maximum period  
fp.startMine()
```

output is displayed as follows:

- Periodic-Frequent patterns were generated successfully using periodic-TubeS algorithm in uncertain databases

For example:

If we execute the following command:

```
import ptubes as Myap
```

```
fp= Myap.Ptubes()  
fp.iFile = “file name”
```

fp.minSup = minimum support
fp.maxper = maximum period
fp.startMine()

output is displayed as follows:

- Periodic-Frequent patterns were generated successfully using periodic-TubeS algorithm in uncertain databases

2. To get the periodic-frequent patterns along with their support count:

2.1. Complete the PFPM Process mentioned in **(1)**

2.2. Then call the method '**getFrequentPatterns**' using the following command:

```
import ptubes as Myap  
fp= Myap.Ptubes()  
fp.iFile = "file name"  
fp.minSup = minimum support  
fp.maxper = maximum period  
fp.startMine()  
variable = fp.getFrequentPatterns()
```

output is displayed as follows:

- Periodic-Frequent patterns were generated successfully using periodic-TubeS algorithm in uncertain databases
- All the periodic-Frequent patterns will be stored in a dictionary, with patterns as keys and support count as value and returned to the called function.

For example:

If we execute the following command:

```
import ptubes as Myap  
  
fp= Myap.Ptubes()  
fp.iFile = "file name"  
fp.minSup = minimum support  
fp.maxper = maximum period  
fp.startMine()  
frequentPatterns = fp.getFrequentPatterns()
```

output is displayed as follows:

- Periodic-Frequent patterns were generated successfully using periodic-TubeS algorithm in uncertain databases

- All the periodic-frequent patterns will be stored in a dictionary, with patterns as keys and support count as value and assigned to the variable called '**frequentPatterns.**'
3. To get the periodic-frequent patterns along with their support count in a file:
 - 3.1. Complete the PFPM Process mentioned in **(1)**
 - 3.2. Then call the method '**storePatternsInFile**' using the following command:

```
import ptubes as Myap
fp= Myap.Ptubes()
fp.iFile = "file name"
fp.minSup = minimum support
fp.maxper = maximum period
fp.startMine()
fp.storePatternsInFile("output file")
```

output is displayed as follows:

- Periodic-Frequent patterns were generated successfully using periodic-TubeS algorithm in uncertain databases
- All the periodic-Frequent patterns will be stored in a file named as "output file"

For example:

If we execute the following command:

```
import ptubes as Myap

fp= Myap.Ptubes()
fp.iFile = "file name"
fp.minSup = minimum support
fp.maxper = maximum period
fp.startMine()
fp.storePatternsInFile("sampleoutput")
```

output is displayed as follows:

- Periodic-Frequent patterns were generated successfully using periodic-TubeS algorithm in uncertain databases.
- All the periodic-frequent patterns will be stored in a file named as 'sampleoutput.'

4. To get the periodic-frequent patterns along with their support count in a DataFrame:
 - 4.1. Complete the PFPM Process mentioned in **(1)**

4.2. Then call the method '**getPatternsInDataFrame**' using the following command:

```
import ptubes as Myap  
fp= Myap.Ptubes()  
fp.iFile = "file name"  
fp.minSup = minimum support  
fp.maxper = maximum period  
fp.startMine()  
variable =fp.getPatternsInDataFrame()
```

output is displayed as follows:

- Periodic-Frequent patterns were generated successfully using periodic-TubeS algorithm in uncertain databases.
- All the periodic-Frequent patterns will be stored in a data frame, their columns named as 'Patterns' and 'Support and Period' and returned to the called function.

For example:

If we execute the following command:

```
import ptubes as Myap  
  
fp= Myap.Ptubes()  
fp.iFile = "file name"  
fp.minSup = minimum support  
fp.maxper = maximum period  
fp.startMine()  
dataFrame= fp.getPatternsInDataFrame()
```

output is displayed as follows:

- Periodic-Frequent patterns were generated successfully using periodic-TubeS algorithm in uncertain databases.
- All the periodic-Frequent patterns will be stored in a data frame, their columns named as 'Patterns' and 'Support and Period' and stored in a variable called 'dataFrame.'

5. If we want to know the amount of USS memory consumed by the periodic-TubeS algorithm:

5.1. Complete the PFPM Process mentioned in **(1)**

5.2. Then call the method '**getMemoryUSS**' using the following command:

```
import ptubes as Myap  
fp= Myap.Ptubes()
```

```
fp.iFile = "file name"  
fp.minSup = minimum support  
fp.maxper = maximum period  
fp.startMine()  
variable = fp.getMemoryUSS()
```

output is displayed as follows:

- Periodic-Frequent patterns were generated successfully using periodic-TubeS algorithm in uncertain databases.
- Total amount of USS memory consumed by the program will be computed and returned to the called function.

For example:

If we execute the following command:

```
import ptubes as Myap  
  
fp= Myap.Ptubes()  
fp.iFile = "file name"  
fp.minSup = minimum support  
fp.maxper = maximum period  
fp.startMine()  
memoryUSS = fp.getMemoryUSS()
```

output is displayed as follows:

- Periodic-Frequent patterns were generated successfully using periodic-TubeS algorithm in uncertain databases.
- Total amount of USS memory consumed by the program will be computed and returned to the variable called '**memoryUSS.**'

6. If we want to know the amount of RSS memory consumed by the periodic-TubeS algorithm:

6.1. Complete the PFPM Process mentioned in **(1)**

6.2. Then call the method '**getMemoryRSS**' using the following command:

```
import ptubes as Myap  
  
fp= Myap.Ptubes()  
fp.iFile = "file name"  
fp.minSup = minimum support  
fp.maxper = maximum period  
fp.startMine()  
variable = fp.getMemoryRSS()
```

output is displayed as follows:

- Periodic-Frequent patterns were generated successfully using periodic-TubeS algorithm in uncertain databases.
- Total amount of RSS memory consumed by the program will be computed and returned to the called function.

For example:

If we execute the following command:

```
import ptubes as Myap

fp= Myap.Ptubes()
fp.iFile = "file name"
fp.minSup = minimum support
fp.maxper = maximum period
fp.startMine()
memoryRSS = fp.getMemoryRSS()
```

output is displayed as follows:

- Periodic-Frequent patterns were generated successfully using periodic-TubeS algorithm in uncertain databases.
- Total amount of RSS memory consumed by the program will be computed and returned to the variable called ' **memoryRSS.**'

7. If we want to know the runtime taken by the periodic-TubeS algorithm created by us:

7.1. Complete the PFPM Process mentioned in **(1)**

7.2. Then call the method '**getRuntime**' using the following command:

```
import ptubes as Myap
fp= Myap.Ptubes()
fp.iFile = "file name"
fp.minSup = minimum support
fp.maxper = maximum period
fp.startMine()
variable = fp.getRuntime()
```

output is displayed as follows:

- Periodic-Frequent patterns were generated successfully using periodic-TubeS algorithm in uncertain databases.
- Total runtime taken by the program in seconds will be computed and returned to the called function.

For example:

If we execute the following command:

```
import ptubes as Myap
```

```
fp= Myap.Ptubes()  
fp.iFile = "file name"  
fp.minSup = minimum support  
fp.maxper = maximum period  
fp.startMine()  
run = fp.getRuntime()
```

output is displayed as follows:

- periodic-Frequent patterns were generated successfully using ptubes algorithm in uncertain databases.
- Total runtime taken by the program in seconds will be computed and returned to the variable called 'run.'