

# Telephone Number Routing with Operators.

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*alaTest (ICSS) Challenge 2018*

## Routing of telephone calls

Some telephone operators have submitted their price lists including price per minute for different phone number prefixes. The price lists look like this:

### Operator A:

1	0.9
268	5.1
46	0.17
4620	0.0
468	0.15
4631	0.15
4673	0.9
46732	1.1

### Operator B:

1	0.92
44	0.5
46	0.2
467	1.0
48	1.2

And so on...

The left column represents the telephone prefix (country + area code) and the right column represents the operators price per minute for a number starting with that prefix.

### Mandatory Requirements for Code:

1. Input given for Telephone Number and Output as cheapest operator, with price.
2. Code should be able to handle any number of price lists (operators; prices).
3. Format of telephone number should be same as price list, i.e. integer.
4. When several prefixes match the same number, the longest one should be used.
5. If an operator cannot route a number, it should depict so.
6. Code should have unit tests.

7. No database or GUI, price lists should be stored in memory.

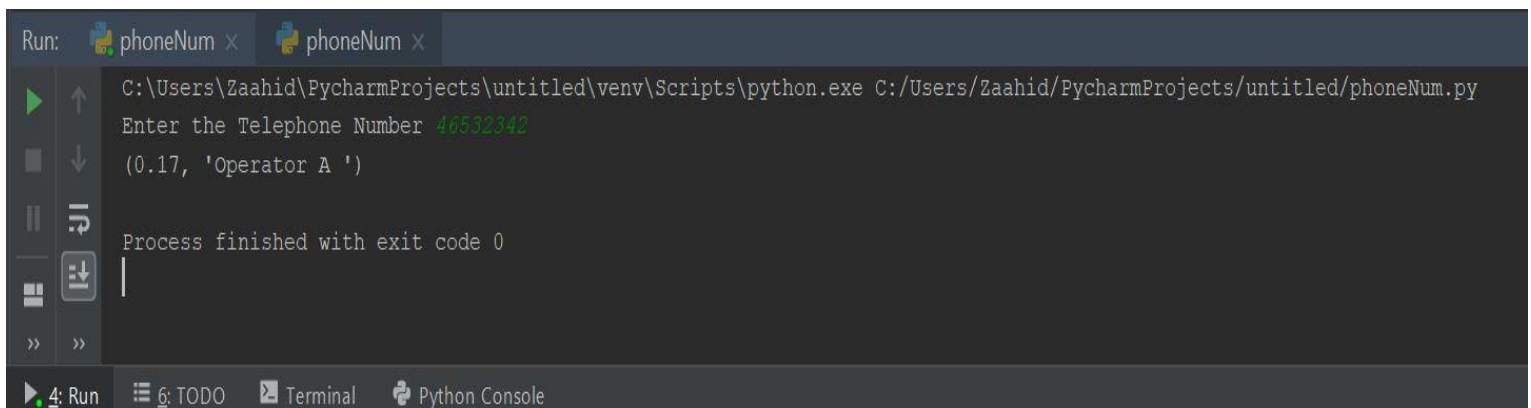
### Features of Code (along with requirements):

1. Input can be given in form of `+telephonenumber` OR `telephonenumber` without '+'
2. Code can handle any number of operators and price lists. (look to readme file for syntax and method.)
3. If telephone number cannot be routed through any operator, output shows, not routable by any operator message.

### Different Cases for Telephone Number:

1. Input = 46532342

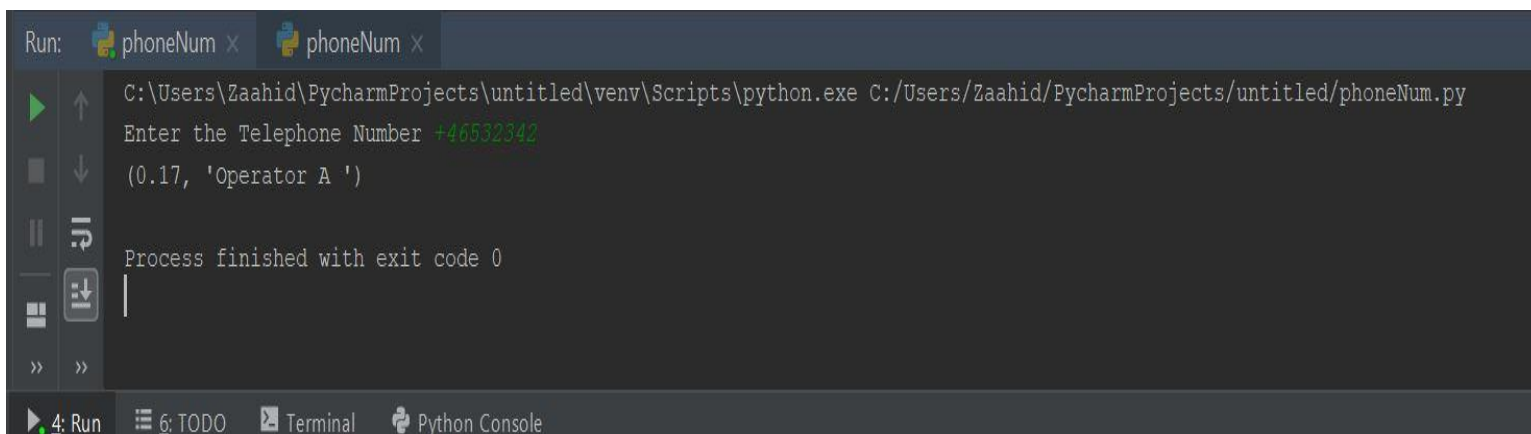
- Prefix exists in both Operator A and Operator B.
- Cheaper operator for telephone number is Operator A, 0.17.



```
Run: phoneNum x phoneNum x
C:\Users\Zaahid\PycharmProjects\untitled\venv\Scripts\python.exe C:/Users/Zaahid/PycharmProjects/untitled/phoneNum.py
Enter the Telephone Number 46532342
(0.17, 'Operator A ')
Process finished with exit code 0
```

2. Input = +46532342

- Even though number is entered with '+', input will be read as integer.
- Prefix exists in both Operator A and Operator B.
- Cheaper operator for telephone number is Operator A, 0.17.



```
Run: phoneNum x phoneNum x
C:\Users\Zaahid\PycharmProjects\untitled\venv\Scripts\python.exe C:/Users/Zaahid/PycharmProjects/untitled/phoneNum.py
Enter the Telephone Number +46532342
(0.17, 'Operator A ')
Process finished with exit code 0
```

### 3. Input = 4673212121

- Prefix consists of 46, 467, 4673, 46732.
- Longest prefix is 46732, which will be considered.
- Cheapest operator for telephone number is Operator A, 1.1

```
Run: phoneNum x
C:\Users\Zaahid\PycharmProjects\untitled\venv\Scripts\python.exe C:/Users/Zaahid/PycharmProjects/untitled/phoneNum.py
Enter the Telephone Number 4673212121
(1.1, 'Operator A ')
Process finished with exit code 0
```

### 4. Input = 9599664434

- Prefix does not exist in both Operator A and Operator B
- Output will be depicted so with no Operator.

```
Run: phoneNum x
C:\Users\Zaahid\PycharmProjects\untitled\venv\Scripts\python.exe C:/Users/Zaahid/PycharmProjects/untitled/phoneNum.py
Enter the Telephone Number 9599664434
Not Found in Operator A
Not Found in Operator B
None
Process finished with exit code 0
```

### 5. Input = 4423244343

- Prefix is 44. With Operator B at 0.5.
- Case here is that data has been changed at Unit Test part of code, with corresponding data as 0.25.
- Output presents that unit test has failed.

```
5
6 class DFTests(unittest.TestCase):
7     def setUp(self, df):
8         try:
9             my_df1 = df1
10            my_df2 = df2
11
12            expected_df1 = pd.DataFrame({'Operator': [1, 268, 46, 4620, 468, 4631, 4673, 46732], 'Cost': [0.9, 5.1, 0.17, 0.0, 0.15, 0.15, 0.9, 1.1]})
13            expected_df2 = pd.DataFrame({'Operator': [1, 44, 46, 467, 48], 'Cost': [0.92, 0.25, 0.2, 1.3, 1.2]})
14            pd.testing.assert_frame_equal(my_df1, expected_df1)
15            pd.testing.assert_frame_equal(my_df2, expected_df2)
16        except Exception as e:
```

Run: phoneNum x

C:\Users\Zaahid\PycharmProjects\untitled\venv\Scripts\python.exe C:/Users/Zaahid/PycharmProjects/untitled/phoneNum.py

Enter the Telephone Number 4423244343

Unit Test failed DataFrame.iloc[:, 1] are different

DataFrame.iloc[:, 1] values are different (20.0 %)

[left]: [0.92, 0.5, 0.2, 1.3, 1.2]

[right]: [0.92, 0.25, 0.2, 1.3, 1.2]

Unit Test failed DataFrame.iloc[:, 1] are different

DataFrame.iloc[:, 1] values are different (20.0 %)

[left]: [0.92, 0.5, 0.2, 1.3, 1.2]

[right]: [0.92, 0.25, 0.2, 1.3, 1.2]

Not Found in Operator A

(0.5, 'Operator B ')

Process finished with exit code 0

## 6. Input = 26832323

- Prefix is 268 with Operator A at 5.1.
- As prefix does not exist in Operator B, message is shown.

Run: phoneNum x

C:\Users\Zaahid\PycharmProjects\untitled\venv\Scripts\python.exe C:/Users/Zaahid/PycharmProjects/untitled/phoneNum.py

Enter the Telephone Number 26832323

Not Found in Operator B

(5.1, 'Operator A ')

Process finished with exit code 0