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Program 1

In [1]:
```
input_list = [1,2,3,4,4,5,6,7,7]
output_list = []
for var in input_list:
    if var % 2 == 0:
        output_list.append(var)

print('Output List using for loop is : ', output_list)
```

```
Output List using for loop is :  [2, 4, 4, 6]
```

Program 2

In [2]:
```
input_list = [1,2,3,4,4,5,6,7,7]
list_using_comp = [var for var in input_list if var % 2 == 0]
print('Output list using comprehensions is : ', list_using_comp)
```

```
Output list using comprehensions is :  [2, 4, 4, 6]
```

Program 3

In [3]:
```
output_list = []
for var in range(1, 10):
    output_list.append(var ** 2)

print('Output List using for Loop : ',output_list)
```

```
Output List using for Loop :  [1, 4, 9, 16, 25, 36, 49, 64, 81]
```

Program 4

In [4]:
```
list_using_comp = [var**2 for var in range(1, 10)]
print('Output list using comprehensions is : ', list_using_comp)
```

```
Output list using comprehensions is :  [1, 4, 9, 16, 25, 36, 49, 64, 81]
```

Program 5

In [5]:
```
num_list = [y for y in range(100) if y % 2 == 0 if y % 5 == 0]
print(num_list)
```

```
[0, 10, 20, 30, 40, 50, 60, 70, 80, 90]
```

Program 6

In [6]:
```
transposed = []
matrix = [[1,2,3,4],[4,5,6,8]]

for i in range(len(matrix[0])):
    transposed_row = []

    for row in matrix:
        transposed_row.append(row[i])
    transposed.append(transposed_row)
print(transposed)
```

```
[[1, 4], [2, 5], [3, 6], [4, 8]]
```

Program 7

In [7]:
```
matrix = [[1, 2], [3, 4], [5, 6], [7, 8]]
transpose = [[row[i] for row in matrix]for i in range(2)]
print(transpose)
```

```
[[1, 3, 5, 7], [2, 4, 6, 8]]
```

Program 8

In [8]:
```
dict1 = {'a':1, 'b':2, 'c':3, 'd':4, 'e':5}
double_dict1 = {k:v*2 for (k,v) in dict1.items()}
print(double_dict1)
```

```
{'a': 2, 'b': 4, 'c': 6, 'd': 8, 'e': 10}
```

Program 9

In [9]:
```
dict1 = {'a':1, 'b':2, 'c':3, 'd':4, 'e':5}
double_dict1 = {k*2:v*3 for (k,v) in dict1.items()}
print(double_dict1)
```

```
{'aa': 3, 'bb': 6, 'cc': 9, 'dd': 12, 'ee': 15}
```

Program 10

In [10]:
```
dict1 = {'a':1, 'b':2, 'c':3, 'd':4, 'e':5, 'f':6, 'g':7}
dict1_doubleCond = {k:v for (k,v) in dict1.items() if v>2 if v%2 == 0}
print(dict1_doubleCond)
```

```
{'d': 4, 'f': 6}
```

Program 11

In [11]:
```
nested_dict = {'first':{'a':1}, 'second':{'b':2}, 'third':{'c':'3'}, 'forth':{
'd':4}}
float_dict = {outer_k: {float(inner_v) for (inner_k, inner_v)in outer_v.items
()} for (outer_k, outer_v) in nested_dict.items()}
print(float_dict)
```

```
{'first': {1.0}, 'second': {2.0}, 'third': {3.0}, 'forth': {4.0}}
```

Program 12

In [12]:
```
def cubes(y):
    return y*y*y;

c = lambda x:x*x*x
print(c(7))
print(cubes(5))
```

```
343
125
```

Program 13

In [13]:
```
li = [5,7,22,97,54,62,77,23,73,61]
final_list = list(filter(lambda x: (x%2 != 0), li))
print(final_list)
```

```
[5, 7, 97, 77, 23, 73, 61]
```

Program 14

In [14]:
```
li = [5,7,22,97,54,62,77,23,73,61]
final_list = list(map(lambda x: (x%2 != 0), li))
print(final_list)
```

```
[True, True, False, True, False, False, True, True, True, True]
```

Program 15

In [15]:
```
from functools import reduce
li = [5,7,22,97,54,62,77,23,73,61]
final_list = reduce(lambda x, y : x + y,  li)
print(final_list)
```

```
481
```