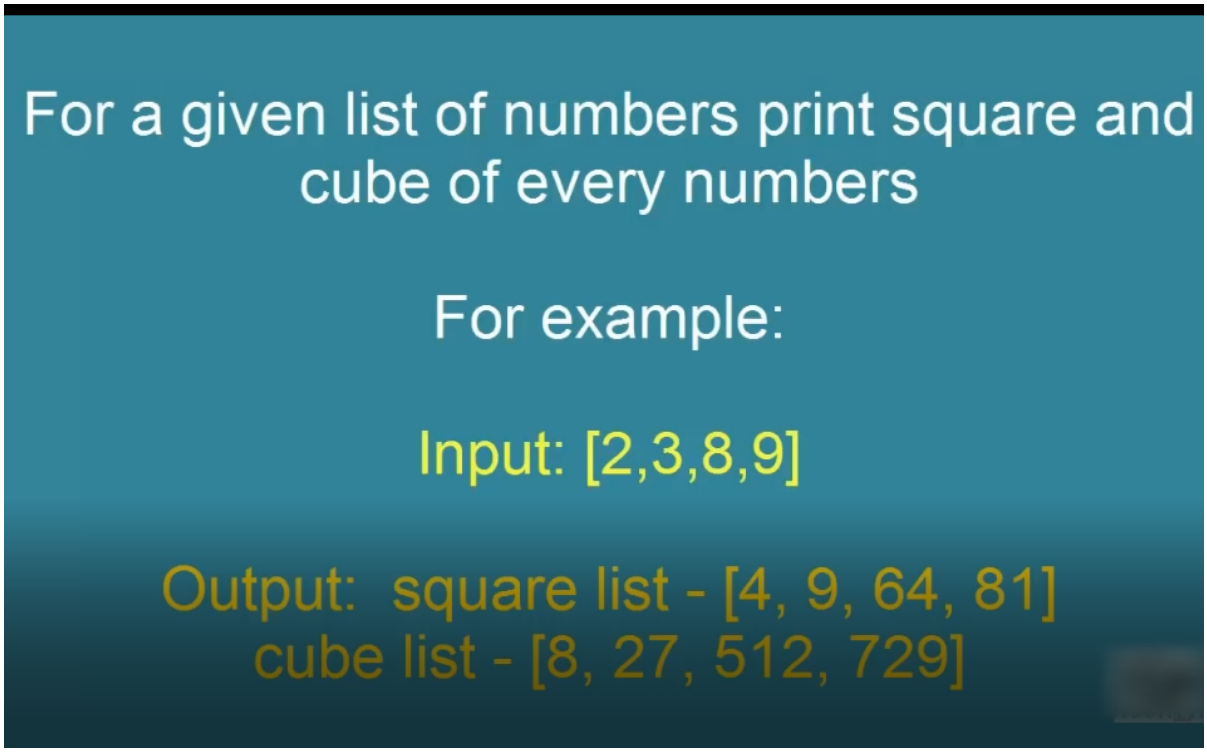
Multi Threading With Python

What Multi Threading Means?

Multi Threading is often explained by giving the example of a busy mom, as you see in the in the picture the busy mom juggles with multiple things at the same time, she might cooking food taking care of babies and answering the phone calls at the same

time. and she needs to handle all of this in a parallel manner. so let say the red line is a time period she have to cook food, take care of baby and answer the phone call at the same time. so if we look at the picture from a programmer perspective the mom deals with there thread in the redline time period. so mom is doing multithreading similarly a Python program can do the same and that program is called to be multi threading program.

Example:



so we have a array contains multiple numbers and we are gonna calculate the square root for each of those, at the same time we want to calculate the cube of these numbers and print it on the screen. so we have to handle two task calculating the square and calculating the cube root.

Normal Version of Code

```
import time
def calc_square(numbers):
    print("calculate square numbers")
    for n in numbers:
        time.sleep(0.2)
        print('square:',n*n)
```

```
def calc_cube(numbers):
    print("calculate cube of numbers")
    for n in numbers:
        time.sleep(0.2)
        print('cube',n*n*n)
arr = [2,3,8,9]
t  = time.time()
calc_square(arr)
calc_cube(arr)
print("done in: ",time.time()-t)
print("Ha... I am done with my work now!")
```

```
(myvenv) PS E:\Projects\Projects\Personal_Projects\2023\Jan\Multi_Threading_With_Python> python video1.py
calculate square numbers
square: 4
square: 9
square: 64
square: 81
calculate cube of numbers
cube 8
cube 27
cube 512
cube 729
done in:  1.6058673858642578
Ha... I am done with my work now!
```

Multi Threading Version of Code

```
import time
import threading
def calc_square(numbers):
    print("calculate square numbers")
    for n in numbers:
        time.sleep(0.2)
        print('square:',n*n)
def calc_cube(numbers):
    print("calculate cube of numbers")
    for n in numbers:
        time.sleep(0.2)
        print('cube',n*n*n)
arr = [2,3,8,9]
time_  = time.time()
t0= threading.Thread(target=calc_square,args=(arr,))
t1= threading.Thread(target=calc_cube,args=(arr,))
# start the thread
t0.start()
t1.start()
# wait until it is done
t1.join()
```

```
t1.join()
print("done in: ",time.time()-time_)
print("Ha... I am done with my work now!")
```

```
(myvenv) PS E:\Projects\Projects\Personal_Projects\2023\Jan\Multi_Threading_With_Python> python video1.py
calculate square numbers
calculate cube of numbers
square: 4
cube 8
square: 9
cube 27
square: 64
cube 512
square: 81
cube 729
done in:  0.8034534454345703
Ha... I am done with my work now!
```