| Experiment No. 12 |
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| Demonstrate the concept of Multi-threading |
| Date of Performance: |
| Date of Submission: |

# Experiment No. 12

**Title:** Demonstrate the concept of Multi-threading

**Aim:** To study and implement the concept of Multi-threading **Objective:** To introduce the concept of Multi-threading in python **Theory:**

### Thread

In computing, a **process** is an instance of a computer program that is being executed. Any process has 3 basic components:

* An executable program.
* The associated data needed by the program (variables, work space, buffers, etc.)
* The execution context of the program (State of process)

A **thread** is an entity within a process that can be scheduled for execution. Also, it is the smallest unit of processing that can be performed in an OS (Operating System).

In simple words, a **thread** is a sequence of such instructions within a program that can be executed independently of other code. For simplicity, you can assume that a thread is simply a subset of a process!

A thread contains all this information in a **Thread Control Block (TCB)**:

* **Thread Identifier:** Unique id (TID) is assigned to every new thread
* **Stack pointer:** Points to thread’s stack in the process. Stack contains the local variables under thread’s scope.
* **Program counter:** a register which stores the address of the instruction currently being executed by thread.
* **Thread state:** can be running, ready, waiting, start or done.
* **Thread’s register set:** registers assigned to thread for computations.
* **Parent process Pointer:** A pointer to the Process control block (PCB) of the process that the thread lives on.

### Code:

### Program 01 : -

### import threading

### import time

### def cut\_ticket(name, friend\_name):

### print(f"Cutting ticket for {name} and {friend\_name}")

### time.sleep(2)

### print("Ticket cutting completed")

### def show\_seating():

### print("Showing seating arrangement")

### time.sleep(3)

### print("Seating arrangement displayed")

### def main():

### name = "Sonu"

### friend\_name = "Ironman"

### ticket\_thread = threading.Thread(target=cut\_ticket, args=(name, friend\_name))

### seating\_thread = threading.Thread(target=show\_seating)

### ticket\_thread.start()

### seating\_thread.start()

### ticket\_thread.join()

### seating\_thread.join()

### print("Enjoy the movie!")

### main()

### Output:

### 

### Program 02 : -

# Python program to illustrate the concept

# of threading

# importing the threading module

import threading

def print\_cube(num):

"""

function to print cube of given num

"""

print("Cube: {}".format(num \* num \* num))

def print\_square(num):

"""

function to print square of given num

"""

print("Square: {}".format(num \* num))

if \_\_name\_\_ == "\_main\_":

# creating thread

t1 = threading.Thread(target=print\_square, args=(10,))

t2 = threading.Thread(target=print\_cube, args=(10,))

# starting thread 1

t1.start()

# starting thread 2

t2.start()

# wait until thread 1 is completely executed

t1.join()

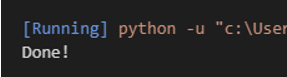
# wait until thread 2 is completely executed

t2.join()

# both threads completely executed

print("Done!")

**Output : -**

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**Conclusion:**

Multithreading has been successfully implemented in python.