Multithreading
Assignment Questions

Q1.What is multithreading in python? Why is it used? Name the module used to handle threads in python.

Ans:- Multithreading enables us to run multiple threads simultaneously and also in consecutive order.

Multithreading helps to efficient utilization of the resources the threads share the data space and memory

And also allows the existing and parallel occurrence of various tasks. It causes a reduction in time consumption or response time, thereby increasing the performance.

The module used to handle the threads

Code::__ thread.start_new_thread (function, args [, kwargs])

1. Importing threading module. (Code:: import threading)
2. Declaration of thread parameters (Code:: def test(id):

Print("this is my print %id " %id)

3. Start a new thread (Code:: thread.start_new_thread (function, args [, kwargs])

4. Join Method (Code:: for i in thread

t.start()

t.join ())

Q2. Why threading module used? Write the use of the following functions:

1. activeCount ()
2. currentThread ()
3. enumerate ()

Ans: Python threading module allows to have different parts of program run concurrently and also simplify design provides much more powerful, high-level support for threads.

1. threading.activeCount () − Returns the number of thread objects that are active.
2. threading.currentThread () − Returns the number of thread objects in the caller's thread control.
3. threading.enumerate () − Returns a list of all thread objects that are currently active.

Q3. Explain the following functions

- Run () − The run() method is the entry point for a thread.
- Start () − the start () method starts a thread by calling the run method.
- Join ([time]) − The join () waits for threads to terminate.
- isAlive() − The isAlive() method checks whether a thread is still executing.
- getName() − The getName() method returns the name of a thread.
- setName() − The setName() method sets the name of a thread.

Codes are ipynb file

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Q4. Write a python program to create two threads. Thread one must print the list of squares and thread two must print the list of cubes

Ans : answer is in ipynb file

Q5. State advantages and disadvantages of multithreading.

Ans : Advantages of Multithreading

1. Multithreading in python enables efficient utilization of the resources as the threads share the data space and memory.
2. Python multithreading allows the concurrent and parallel occurrence of various tasks.
3. Multithreading causes a reduction in time consumption or response time, thereby increasing the performance.

Dis Advantages of Multithreading

1. It needs more careful synchronization.
2. It can consume a large space of stocks of blocked threads.
3. It needs support for thread or process.
4. If a parent process has several threads for proper process functioning, the child processes should also be multithreaded because they may be required.
5. It imposes context switching overhead.

6. Explain deadlocks and race conditions.

Ans: race condition is a bug in concurrency programming.race condition is a failure case where the behavior of the program is dependent upon the order of execution by two or more threads. This means, the behavior of the program will not be predictable, possibly changing each time it is run.

Race condition ans is in ipynb file

deadlock is a concurrency failure mode where a thread or threads wait for a condition that never occurs.
The result is that the deadlock threads are unable to progress and the program is stuck or frozen and must be terminated forcefully

1. Waiting to acquire a mutex lock that it has already acquired.
2. Waiting to be notified on a condition by itself.
3. Waiting for an event to be set by itself.
4. Waiting for a semaphore to be released by itself.