APPOINTMENT/MEETING

14 Feb Assignment

1. What is multithreading in python? Why is it used? 2. Name the module used to handle threads in Python.

→ Multithreading refers to concurrently executing multiple threads by rapidly switching the control of the CPU between threads (called context switching). The Python Global interpreter Lock limits one thread to run at a time even if the machine contains multiple processors.

→ Python doesn't support multi-threading because Python on the CPython Interpreter does not support true multi-core execution via multithreading. Python does have a threading library. The GIL does not prevent threading.

→ A threading module is a high-level implementation of multithreading used to deploy an application in Python.

2. Why threading module used? write the use of the following functions:

1. active_count()
2. current_Thread()
3. Enumerate()

Ans:- As we have seen in the previous tutorial, threading module is used for creating, controlling & managing threads in Python.

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The activeCount() method of threading class is used to return the number of active threads in the current thread's group.

→ current_thread() is an inbuilt method of the threading module in Python. It is used to return Thread object which corresponds to the caller's thread of control.

→ Python enumerate() function
the enumerate() function takes a collection (e.g. a tuple) & returns it as an enumerate object.
The enumerate() function adds a counter as the key of the enumerate object.

Q. 3 Explain the following functions:
1. run() A function is a block of code which only runs when it is called. pass data, known as parameters, into a function. A function can return can return data as a result.
2. start() Functions in programming to bundle a set of instructions that you want to use repeatedly → code carry out a specified task.
3. join() takes all the elements of an iterable
4. joins them into a single string used to Seperate the concatenated string.
4. isAlive() It is an inbuilt method of the thread class of the threading module in Python.

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Q.4 Write a python program to create two threads. Thread one must print the list of squares & thread two must print the list of cubes.

```
import threading

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

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

if __name__ == "__main__":
    t1 = threading.Thread(target=print_square,
                          args=(10,))
    t2 = threading.Thread(target=print_cube,
                          args=(10,))

    t1.start()
    t2.start()
    t1.join()
    t2.join()
    print("Done!")
```

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Q. 5 State advantages & disadvantages of Multithreading.

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Solve:- advantages of multithreading:

- Enhanced performance by decreased development time.
- Better use of CPU resource
- Improvised GUI responsiveness.

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- Simplified & streamlined program coding.

→ Multithreading disadvantages:

- Unpredictable results.
- Overhead switching of context.
- Increased difficulty level in writing a program.

Q.6 Explain deadlock & race condition:-

A race condition occurs when two threads use the same variable at a given time.

Deadlock exists when two threads seek one lock simultaneously.

→ It is two tasks compete with each other & try to complete a task before each other.