Lecture 5

POSIX Thread:

In Linux platforms, the C language contains **pthread** standard API for all kinds of thread related functions. It is also known as a POSIX thread that allows users to create many threads for simultaneous processes to flow. It is best used in multi-core systems or processors to implement threads on the kernel to achieve the system.

Implementation:

(Library: #include <pthread.h>)

It is necessary to include this pthread.h header file in the script initially. This will help in using the functions of the pthread library. To compile and execute the c file consisting of pthread library following commands should be used. (Assume the name of the c file is th.c)

```
gcc -o th th.c -lpthread
./th
```

Functions of pthread:

1. **int pthread_create(pthread_t * thread_id, const pthread_attributes_t * attr, void * (*thread_function), void *argument);**
   Purpose: It is used to create a new thread.
   Parameters:
   - **thread_id:** This acts as a pointer to an unsigned integer value. It returns the thread id of the thread that is formed.
   - **attributes:** This parameter acts as a pointer to a structure. It is used to define attributes of a thread that can be the policy of scheduling, and stack address, etc.
   - **thread_function:** This parameter is a pointer to the thread function of a thread.
   - **argument:** This parameter is a pointer to void with different arguments to the function pre-defined at the start of the argument.
2. **void pthread_exit(void *return_value);**
   Purpose: It is used to terminate or end a thread.
   Parameters:
   - **return_value:** It stores the status of the thread such that the thread terminates. It must be a global variable. This will allow the next thread in line to join the thread if it is available.
3. **int pthread_join(pthread_t thread_id, void *thread_return);**
   Purpose: This is a function used at the time of wait for the termination of the thread.
   Parameters:
   - **thread_id:** It is the ID of the thread for which the thread in line waits.
   - **thread_return:** It is the parameter that acts as a pointer to the particular location where we have defined the exit status.