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11. Illustrate the concept of multithreading using a C program.

Aim:

To illustrate the concept of multithreading in C, where multiple threads are executed concurrently.

Algorithm:

1. Initialize the main thread.
2. Create additional threads using pthread_create().
3. Each thread executes a function.
4. The main thread waits for all threads to finish using pthread_join().
5. The threads perform a task, and the main thread handles the synchronization.

Procedure:

1. Include the necessary header for pthreads: <pthread.h>.
2. Define a function that will be executed by each thread.
3. Use pthread_create() to create new threads.
4. Use pthread_join() to ensure the main thread waits for the other threads to finish.
5. Display a message from each thread and the main thread to show parallel execution.

Code:

```
#include <stdio.h>

#include <pthread.h>


void* print_message(void* thread_id) {

  long tid = (long)thread_id;

  printf("Hello from thread %ld\n", tid);
```

```
    return NULL;
}

int main() {
    pthread_t threads[3];
    long t;

    for (t = 0; t < 3; t++) {
        pthread_create(&threads[t], NULL, print_message, (void*)t);
    }

    for (t = 0; t < 3; t++) {
        pthread_join(threads[t], NULL);
    }

    printf("Hello from main thread\n");
    return 0;
}
```

Output: