

Class Activity 4

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1. Creating thread in Linux using Pthreads

```
#include <stdio.h>
#include <pthread.h>

#define NUM_THREADS 5

void* print_message(void* threadid) {
    long tid = (long)threadid;
    printf("Hello from thread %ld\n", tid);

    // Keep thread alive for 5 seconds
    sleep(50);

    pthread_exit(NULL);
}

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

    for (t = 0; t < NUM_THREADS; t++) {
        printf("Creating thread %ld\n", t);
        rc = pthread_create(&threads[t], NULL, print_message, (void*)t);
        if (rc) {
            printf("ERROR; return code from pthread_create() is %d\n", rc);
            return -1;
        }
    }

    // Wait for all threads to complete
    for (t = 0; t < NUM_THREADS; t++) {
        pthread_join(threads[t], NULL);
    }

    printf("All threads completed.\n");
    return 0;
}
```

output:

```
kanha@DESKTOP-MM8KAUH:~/Class-Activities/class-activity4$ ./thread
Creating thread 0
Creating thread 1
Hello from thread 0
Creating thread 2
Hello from thread 1
Creating thread 3
Hello from thread 2
Creating thread 4
Hello from thread 3
Hello from thread 4
All threads completed.
```

2. Creating thread in Windows (make sure to create more thread) and visualize in Process Explorer

svchost.exe	11396	Running	kanha	00	0 K	64 bit	Disabled
thread.exe	27252	Running	kanha	00	0 K	64 bit	Disabled

3. Creating threads in Java using Java Executor Framework: SingleThread, CachedThreadPool and Visualize Fork-Join Parallelism in Java

- Single thread

output:

```
ssages -cp C:\Users\kanha\AppData\Roam1
Task 0 running in pool-1-thread-1
Task 1 running in pool-1-thread-1
Task 2 running in pool-1-thread-1
Task 3 running in pool-1-thread-1
Task 4 running in pool-1-thread-1
```

- Cached Thread pool

output:

```
ssages -cp C:\Users\kanha\AppData\Roam1
Task 9 running in pool-1-thread-10
Task 7 running in pool-1-thread-8
Task 6 running in pool-1-thread-7
Task 3 running in pool-1-thread-4
Task 4 running in pool-1-thread-5
Task 1 running in pool-1-thread-2
Task 0 running in pool-1-thread-1
Task 8 running in pool-1-thread-9
Task 2 running in pool-1-thread-3
Task 5 running in pool-1-thread-6
```

- Fork Pool

```
ssages -cp C:\Users  
Total sum: 36
```