Activity 5

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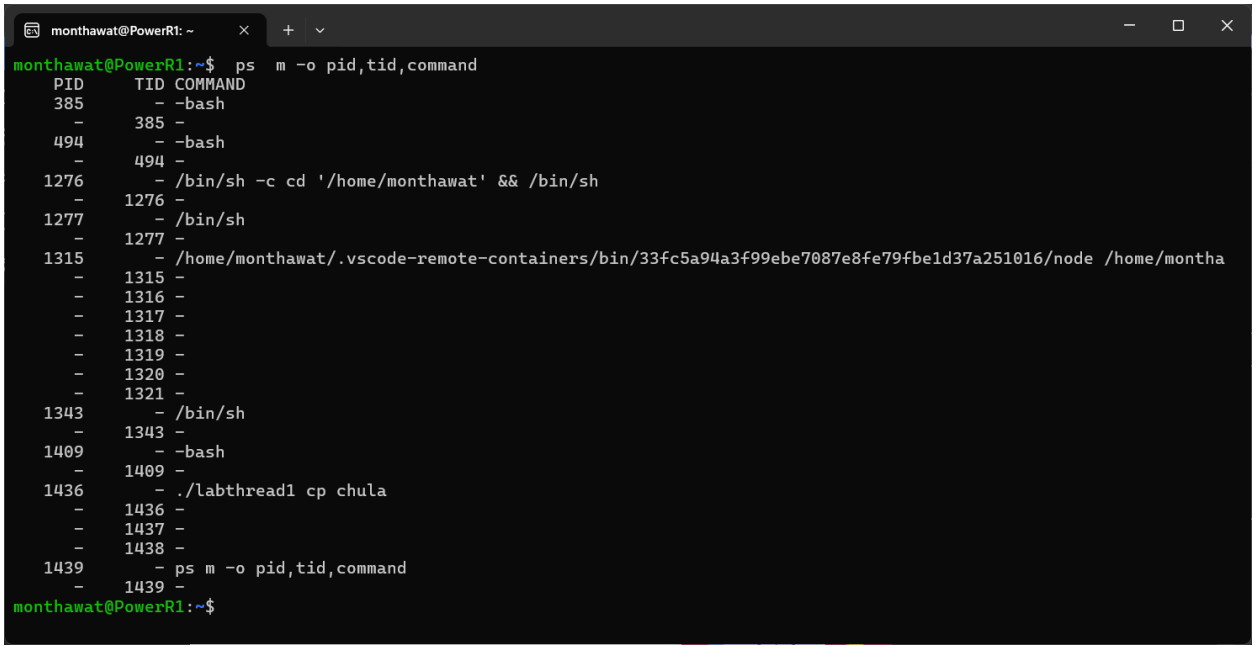
1.1

```c
#include <stdio.h>
#include <pthread.h>
#include <stdlib.h>
#include <unistd.h>

void* say_hello(void* data) {
    char *str = (char*)data;
    while (1) {
        printf("%s\n", str);
        sleep(1);
    }
}

int main(int argc, char *argv[]) {
    if (argc != 3) {
        printf("Usage: %s arg1 arg2\n", argv[0]);
        return 1;
    }

    pthread_t t1, t2;

    pthread_create(&t1, NULL, say_hello, (void*)argv[1]);
    pthread_create(&t2, NULL, say_hello, (void*)argv[2]);
    pthread_join(t1, NULL);
    pthread_join(t2, NULL);

    return 0;
}
```

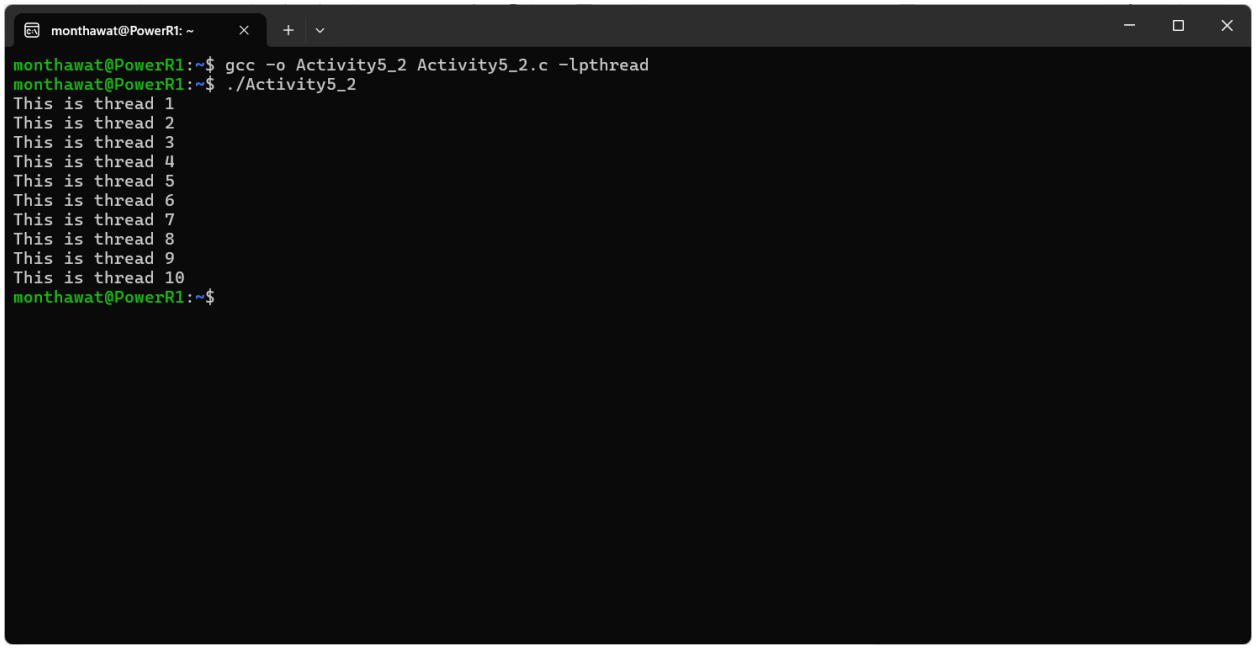
1.2


monthawat@PowerR1: ~
monthawat@PowerR1:~$ ps m -o pid,tid,command
PID TID COMMAND
385 - -bash
- 385 -
494 - -bash
- 494 -
1276 - /bin/sh -c cd '/home/monthawat' && /bin/sh
- 1276 -
1277 - /bin/sh
- 1277 -
1315 - /home/monthawat/.vscode-remote-containers/bin/33fc5a94a3f99ebe7087e8fe79fbe1d37a251016/node /home/montha
- 1315 -
- 1316 -
- 1317 -
- 1318 -
- 1319 -
- 1320 -
- 1321 -
1343 - /bin/sh
- 1343 -
1409 - -bash
- 1409 -
1436 - ./labthread1 cp chula
- 1436 -
- 1437 -
- 1438 -
1439 - ps m -o pid,tid,command
- 1439 -
monthawat@PowerR1:~$

2.1

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

#define NUM_THREADS 10

void* print_thread_number(void* arg) {
    int thread_number = *(int*)arg;
    printf("This is thread %d\n", thread_number);
    return NULL;
}

int main() {
    pthread_t threads[NUM_THREADS];
    int thread_ids[NUM_THREADS];

    for (int i = 0; i < NUM_THREADS; i++) {
        thread_ids[i] = i + 1;
        pthread_create(&threads[i], NULL, print_thread_number,
(void*)&thread_ids[i]);
    }

    for (int i = 0; i < NUM_THREADS; i++) {
        pthread_join(threads[i], NULL);
    }

    return 0;
}
```

2.2

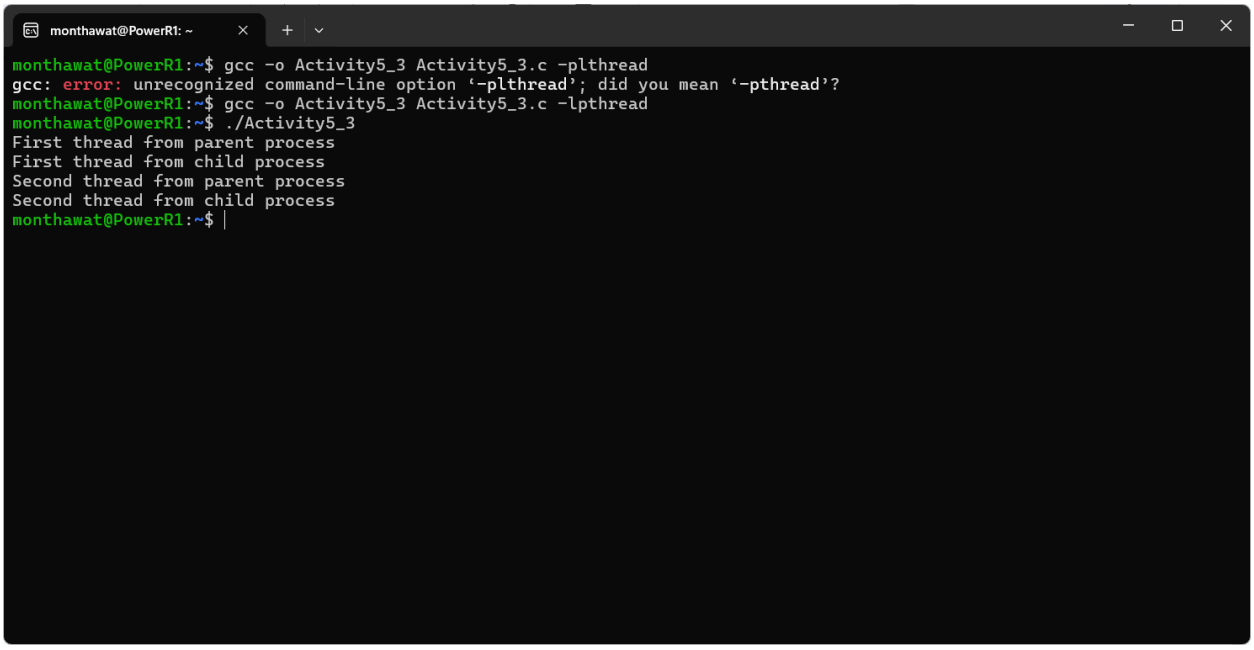


3.1

```c
#include <stdio.h>
#include <pthread.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/wait.h>

void* parent_thread_1(void* arg) {
    printf("First thread from parent process\n");
    return NULL;
}

void* parent_thread_2(void* arg) {
    printf("Second thread from parent process\n");
    return NULL;
}

void* child_thread_1(void* arg) {
    printf("First thread from child process\n");
    return NULL;
}
```

```c
void* child_thread_2(void* arg) {
    printf("Second thread from child process\n");
    return NULL;
}

int main() {
    pthread_t t1, t2;

    pid_t pid = fork();

    if (pid < 0) {
        perror("Fork failed");
        return 1;
    } else if (pid == 0) {
        pthread_t child_t1, child_t2;

        pthread_create(&child_t1, NULL, child_thread_1, NULL);
        pthread_create(&child_t2, NULL, child_thread_2, NULL);

        pthread_join(child_t1, NULL);
        pthread_join(child_t2, NULL);
    } else {
        pthread_create(&t1, NULL, parent_thread_1, NULL);
        pthread_create(&t2, NULL, parent_thread_2, NULL);

        pthread_join(t1, NULL);
        pthread_join(t2, NULL);

        wait(NULL);
    }

    return 0;
}
```

3.2


monthawat@PowerR1: ~
monthawat@PowerR1:~$ gcc -o Activity5_3 Activity5_3.c -plthread
gcc: error: unrecognized command-line option ‘-plthread’; did you mean ‘-pthread’?
monthawat@PowerR1:~$ gcc -o Activity5_3 Activity5_3.c -lpthread
monthawat@PowerR1:~$ ./Activity5_3
First thread from parent process
First thread from child process
Second thread from parent process
Second thread from child process
monthawat@PowerR1:~$