

# Hands-on 6 & 7 Thread Programming

---

## Diego Javier Mora Cortes

---

Primero vemos que tenemos nuestro archivo main.c

```
ho6 cat main.c
#include <stdio.h>
#include <stdlib.h>
#include <pthread.h>
#include <semaphore.h>
#include <unistd.h>

int sum = 0; // Global int to store the sum of the two arrays
sem_t mutex; // Synchronization Bit

void *add(void *arg){
    int *ptr = (int *) arg;
    while(*ptr != -1){
        sem_wait(&mutex);
        sum += *ptr;
        printf("value: %d sum %d\n", *ptr,sum );
        sem_post(&mutex);
        ptr++;
    }
    return NULL;
}

int main(int argc, char *args[]){
    int A[4] = {1,2,3, -1}; // -1 marks the end of array
    int B[4] = {4,2,6, -1};

    pthread_t t_a, t_b;
    sem_init(&mutex, 0, 1);
    pthread_create(&t_a , NULL, add, A);
    pthread_create(&t_b, NULL, add, B);

    pthread_join(t_a, NULL);
    pthread_join(t_b, NULL);
    printf("Total: %d\n", sum);

    return 0;
}
ho6
```

# Y despues de compilarlo, vemos como al ejecutar concurrentemente las dos funciones vemos su ouput en a.out

---

```
ho6 ~ mkdir ho6
ho6 ~ cd ho6
ho6 vi main.c
ho6 gcc ma
ho6 gcc mai
ho6 gcc main.c
main.c:28:5: warning: 'sem_init' is deprecated [-Wdeprecated-declarations]
    sem_init(&mutex, 0, 1);
    ^
/Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/usr/include/sys/semaphore.h:55:42: note: 'sem_init' has been explicitly marked d
eprecated here
int sem_init(sem_t *, int, unsigned int) __deprecated;
/Library/Developer/CommandLineTools/SDKs/MacOSX.sdk/usr/include/sys/cdefs.h:214:40: note: expanded from macro '__deprecated'
#define __deprecated      __attribute__((__deprecated__))
1 warning generated.
ho6 la
total 80
-rwxr-xr-x  1 diegomora  staff   33K May 22 23:04 a.out
-rw-r--r--  1 diegomora  staff  801B May 22 23:03 main.c
ho6 ./a.out
value: 1 sum 1
value: 2 sum 7
value: 3 sum 10
value: 4 sum 5
value: 2 sum 12
value: 6 sum 18
Total: 18
ho6 pwd
/Users/diegomora/ho6
ho6
```