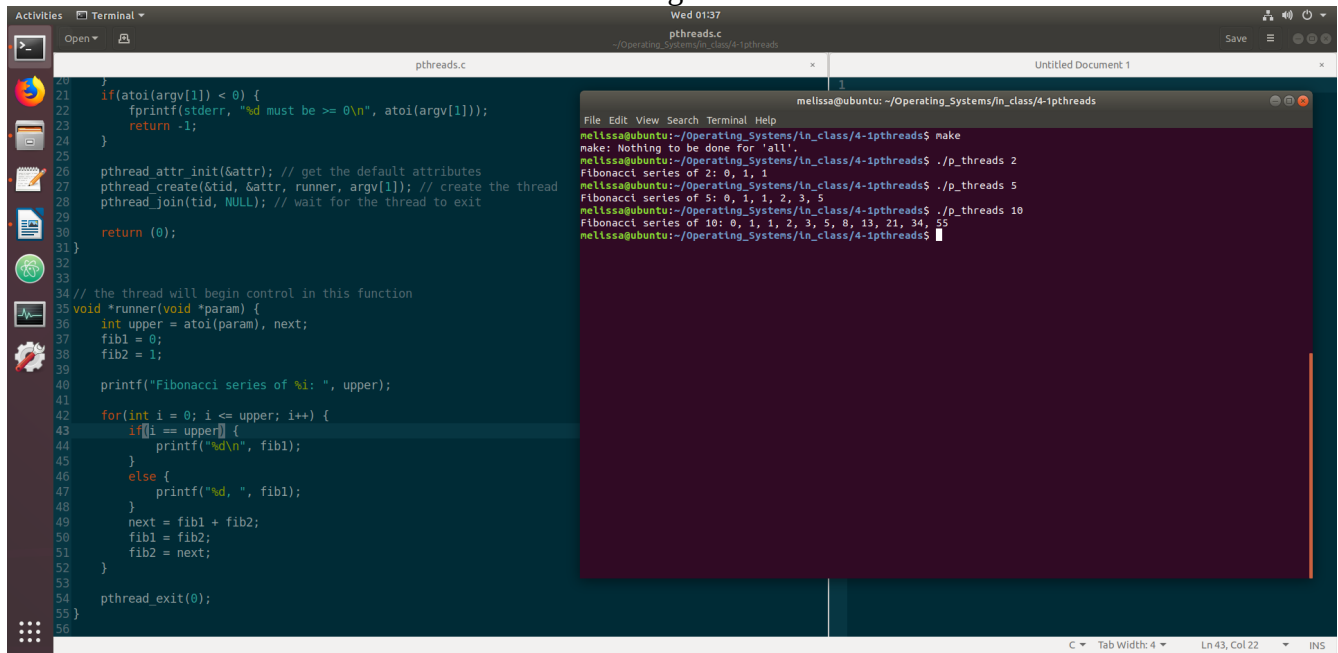


4-1 In-class Assignment: Pthreads



The screenshot shows a Linux desktop environment with a terminal window and a code editor. The code editor displays the source code for `pthreads.c`, which implements a Fibonacci sequence using pthreads. The terminal window shows the execution of the program for different thread counts (2, 5, and 10).

```
20 }
21 if(atoi(argv[1]) < 0) {
22     fprintf(stderr, "%d must be >= 0\n", atoi(argv[1]));
23     return -1;
24 }
25
26 pthread_attr_t attr; // get the default attributes
27 pthread_create(&tid, &attr, runner, argv[1]); // create the thread
28 pthread_join(tid, NULL); // wait for the thread to exit
29
30 return (0);
31 }
32
33 // the thread will begin control in this function
34 void *runner(void *param) {
35     int upper = atoi(param), next;
36     fib1 = 0;
37     fib2 = 1;
38
39     printf("Fibonacci series of %i: ", upper);
40
41     for(int i = 0; i <= upper; i++) {
42         if(i == upper) {
43             printf("%d\n", fib1);
44         }
45         else {
46             printf("%d, ", fib1);
47         }
48         next = fib1 + fib2;
49         fib1 = fib2;
50         fib2 = next;
51     }
52 }
53
54 pthread_exit(0);
55 }
56
```

Terminal Output:

```
melissa@ubuntu:~/Operating_Systems/in_class/4-1pthreads$ make
make: Nothing to be done for 'all'.
melissa@ubuntu:~/Operating_Systems/in_class/4-1pthreads$ ./p_threads 2
Fibonacci series of 2: 0, 1, 1
melissa@ubuntu:~/Operating_Systems/in_class/4-1pthreads$ ./p_threads 5
Fibonacci series of 5: 0, 1, 1, 2, 3, 5
melissa@ubuntu:~/Operating_Systems/in_class/4-1pthreads$ ./p_threads 10
Fibonacci series of 10: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55
melissa@ubuntu:~/Operating_Systems/in_class/4-1pthreads$
```