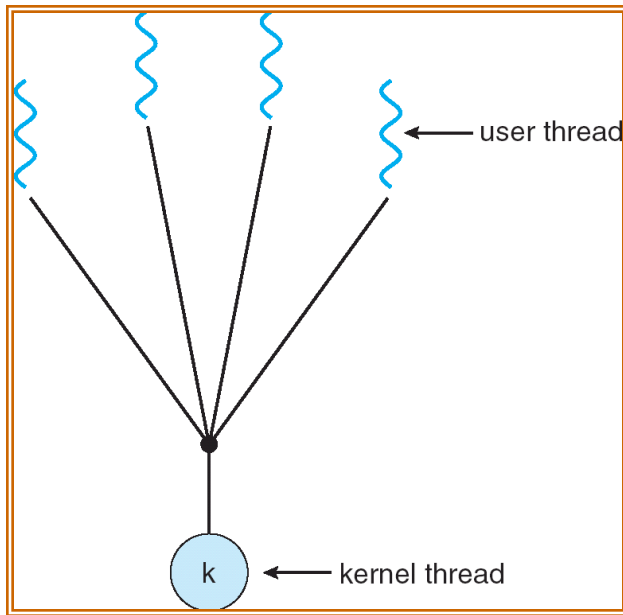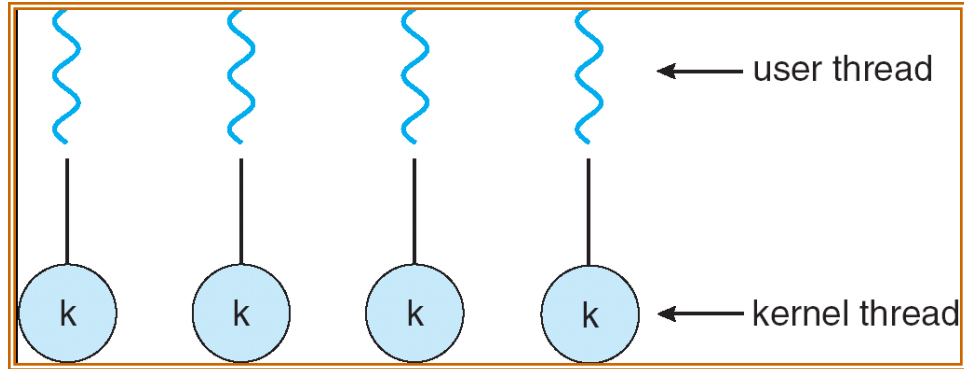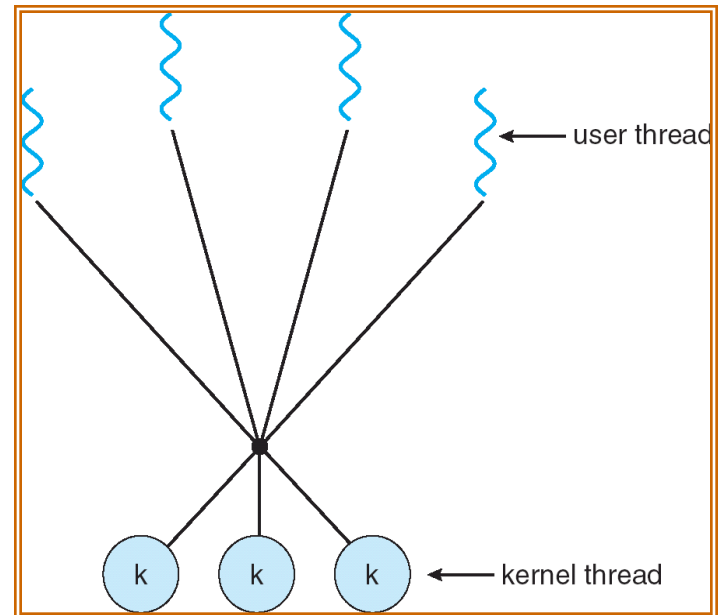# Threading models

Simple One-to-One
Threading Model
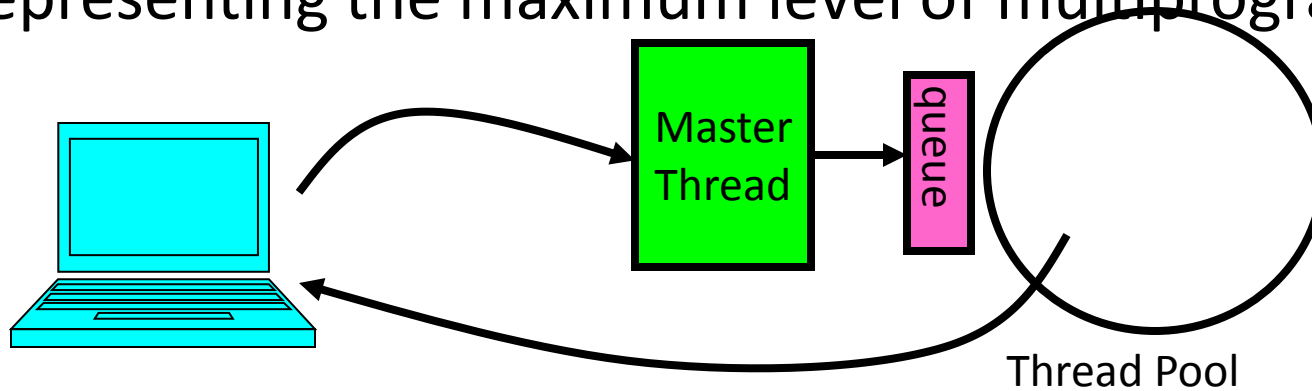


Many-to-One

Many-to-Many

# Thread Pools

- Problem with previous version: Unbounded Threads
  - When web-site becomes too popular – what happens to response times?

- Instead, allocate a bounded "pool" of worker threads, representing the maximum level of multiprogramming



Thread Pool

```
master() {
    allocThreads(worker,queue);
    while(TRUE) {
        con=AcceptCon();
        Enqueue(queue,con);
        wakeUp(queue);
    }
}
```

```
worker(queue) {
    while(TRUE) {
        con=Dequeue(queue);
        if (con==null)
            sleepOn(queue);
        else
            ServiceWebPage(con);
    }
}
```