

Threads

- Every process has at least one thread of execution
 - The main thread starts at `main()` and continues until `main()` returns
- A process may have multiple threads of execution
 - Each thread is like a mini process
- An existing thread can start new threads, which begin executing instructions at the same time as the original thread
- All the threads within a process share an address space
 - No need to create shared memory at the OS level
 - Shared memory can be allocated on the heap
- Each thread has its own stack
- Threads have the same problems with race conditions as processes

Uses for threads

- Parallelism

- If the thread library and the OS support it, threads will run on separate CPU cores simultaneously

- Organization

- Different threads can carry out different tasks in complex programs
 - Waiting for user input
 - Communicating over a network
 - Displaying output

Starting threads

- Use the pthreads library on POSIX systems

pthread_create() - create a thread

pthread_exit() - terminate the thread

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