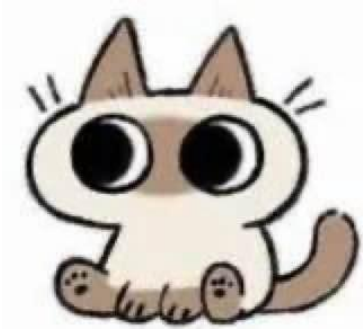
VE482 Homework 3



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Ex 1. General questions

1. **Why would a thread voluntarily release the CPU?**

   Kernels use clock interrupt to ask processes to release the CPU, as processes are greedy. However, threads are working together and programmers decide how threads should sometimes give up CPU to allow other threads to run.

2. **What is the biggest advantage/disadvantage of user space threads?**

   Advantage: easy to switch threads: no traps or context switches are needed.

   Disadvantage: if one thread gets blocked, all threads in the same process get blocked.

3. **If a multi-threaded process forks, a problem occurs if the child gets copies of all the parent's threads. Suppose that one of the original threads was waiting for keyboard input. Now two threads are waiting for keyboard input, one in each process. Does this problem ever occur in single-threaded processes?**

   No, since a blocked single-threaded process cannot fork.

4. **Many UNIX system calls have no Win32 API equivalents. For each such call, what are the consequences when porting a program from a UNIX system to a Windows system?**

   The incompatible system calls might be replaced with a combination of Win32 API system calls or other codes, otherwise the program won't work properly.

Ex 2. C programming

Ex 3. POSIX

POSIX stands for the Portable Operating System Interface. It is specified by IEEE, and contains a family of standards to help maintain the compatibility between different operating systems, such that developers can port applications for different operating systems more easily. For example, POSIX defines the application programming interface (API), command line shells for software compatibility with variants of Unix and other operating systems.

POSIX 7 defines the following: C API, CLI utilities, shell language, environment variables, program exit status, regular expression, directory structure, and so on. If we write programs according to POSIX standards, it would be easy for us to port the program to lots of Unix derivatives, which is very convenient [1].

Reference

1. "What is the meaning of POSIX?" *stack overflow*, https://stackoverflow.com/questions/1780599/what-is-the-meaning-of-posix. ↩