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UOSA Statement of Academic Integrity

On my honor I affirm that I have neither given nor received inappropriate aid in the completion of this exercise.

Signature: ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯ Date: ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Question 1: Resource Management & I/O (20 points)

Skyler can't get his program to compile on the CSN computers. His friend Betty points out that his source code contains calls to non-standard I/O routines for which Skyler's home computer has source code libraries but the school's computers don't. She further points out that, if he doesn't want to change his code, he could copy the source code libraries to his account on the school's computers. He does this and everything compiles and runs fine.

However, Skyler is alarmed. "Betty," he says, "if I can put my own I/O libraries on the CSN machines, then the OS on those machines isn't being a proper resource manager. I could put any I/O libraries I want on those machines and take control of the I/O on them." Is Skyler right? **Explain** your answer.

Question 2: Resource Management & Processes (20 points)

A. POSIX provides for the informational system call `getpid()` but no corresponding `setpid()` system call. Why not? **Explain** your answer.

B. If a program has two calls to `getpid()` in it, under what circumstances, if any, will the two returned values be different? **Explain** your answer.

Question 3: Resource Management & Processes (30 points)

For all parts of this question, assume the system calls succeed.

A. A program sets the value of the global variable A to 15, then calls `fork()`. What will be the value of A in the parent process after the `fork()`? **Explain** your answer.

B. A program sets the value of the global variable A to 15, then calls `fork()`. What will be the value of A in the *resulting new child process*? **Explain** your answer.

C. A program sets the value of the *local* variable B to 22, then calls `fork()`. What will be the value of B in the parent process after the `fork()`? **Explain** your answer.

D. A program sets the value of the local variable B to 22, then calls `fork()`. What will be the value of B in the *resulting new child process*? **Explain** your answer.

E. A program sets the value of the *global* variable C to 37, then calls `exec()`. What will be the value of C in the process after the `exec()`? **Explain** your answer.

F. A program sets the value of the *local* variable D to 76, then calls `exec()`. What will be the value of D in the process after the `exec()`? **Explain** your answer.

Question 4: Resource Management & Threads (15 points)

A. A program sets the value of the global variable G to 81, then creates a new thread. What will be the value of G in the resulting new thread? **Explain** your answer.

B. A program sets the value of the *local* variable H to 99, then creates a new thread. What will be the value of H in the resulting new thread? **Explain** your answer.

C. Is the call to create a new thread a system call or an ordinary function call? **Explain** your answer.

Question 5: Resource Management & The Environment (15 points)

For all parts of this question, assume the system calls succeed.

A. A program sets the value of the environment variable I to 42, then calls `fork()` What will be the value of I in the environment of the resulting new process? **Explain** your answer.

B. A program sets the value of the environment variable J to 57, then *calls* `exec()`. What will be the value of J in the environment of the process *after the* `exec()`? **Explain** your answer.

C. A program sets the value of the environment variable K to 69, then *creates a new thread*. What will be the value of K in the environment of the *resulting new thread*? **Explain** your answer.