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CS350 Assignment 2 - Code Answers

Question 1

copyin() and *copyout*() are used to copy memory between user space and kernel space. *copyin* copies from user space to kernel space and *copyout* copies from kernel space to user space.

Question 2

UIO_USERISPACE and *UIO_USERSPACE* both indicate that the *uio* refers to data in user space, but *UIO_USERISPACE* is used when the data is executable. *UIO_SYSSPACE* indicates that the *uio* refers to data in the kernel space.

Question 3

vfs_close() is called then because we have already successfully loaded the program's contents into memory and do not need to keep the handle to the file open.

Question 4

md_usermode() is used to switch to executing user-level code.

Question 5

userptr_t is used to represent a pointer to data in user space. It is defined in a way so that it cannot be mistakenly used as another type of pointer or have another type of pointer used as a *userptr_t* accidentally.

Question 6

Currently an exception in a user program will cause a kernel panic. This will shut down the whole operating system when we really just want to end the program where the exception occurred.

Question 7

Interrupts should be enabled whenever *mips_syscall()* is called. Interrupts can be either on or off when *kill_curthread()*.

Question 8

vfs_open is used to open a file or device.

Question 9

A vnode represents a file or directory in the file system. A vnode can be used to do things like open, close, read, remove, or rename a file. The full list of operations are listed in vnode.h. We need to create multiple *vnodes* because each process stores its own file table containing its own references to files.