

Name: _____

Student ID: _____

Score : _____ / 50

1. (6 points) There are three things the kernel can do when a signal is received, what are they?

Solution:

(1) Ignore the signal (2) Catch the signal (3) Use default action

2. (4 points) There are two signals can never be ignored, what are they?

Solution: SIGKILL and SIGSTOP

3. (10 points) Fill in the blanks in the figure

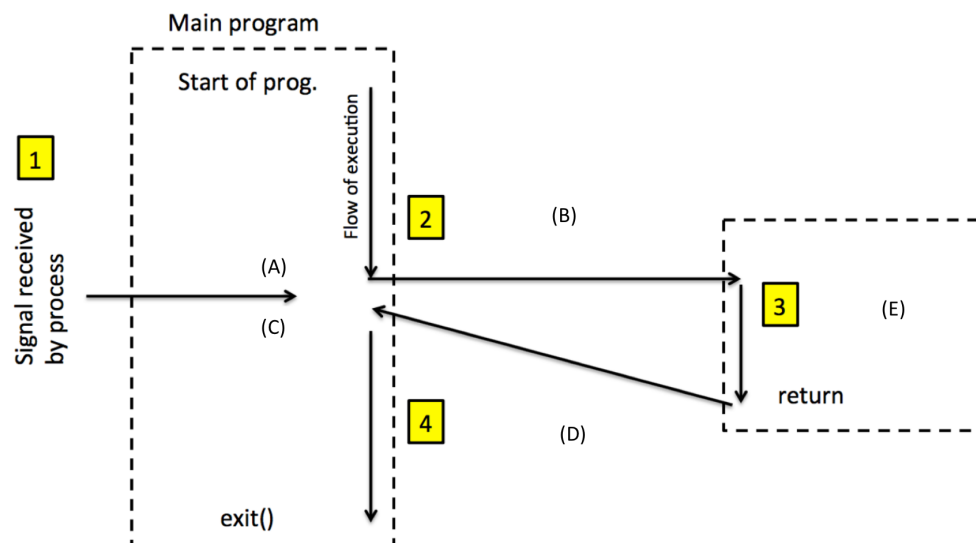


Figure 1: Signal Handling Concept

- (A) _____ **Instruction i** _____
(B) **Kernel calls signal handler on behalf of process**
(C) _____ **Instruction i+1** _____
(D) **signal handler returns to next instruction**

- (E) code of signal handler runs
4. (2 points) Reentrant functions are guaranteed to be safe to call from within a signal handler. They are also called *async-signal safe*.
 5. (6 points) Fill in the following blanks
 1. We say a signal is generated (or sent) for a process, it means that an event that causes the signal occurs
 2. When the action for a signal is taken, we say signal is delivered
 3. A process has the option to blocking the delivery of a signal
 6. (8 points) kill receives two arguments (int kill(pid_t pid, int signo)). You have four choices for the second argument. Distinguish the differences of the following four choices
 1. pid > 0 sends signal to pid
 2. pid == 0 sends signal to all processes in process group ID of the sender pid
 3. pid < 0 sent to all process in process group ID of |pid| pid
 4. pid == -1 sends to all processes has permission to send
 7. (2 points) What header do you need to use sigaddset() function?

Solution: signal.h

8. (6 points) How do the following three options change the behavior of sigprocmask(int how, const sigset_t *restrict set, sigset_t *restrict oset)
 1. SIG_BLOCK set contains signals we want to block
 2. SIG_UNBLOCK set contains signals we want to unblock
 3. SIG_SETMASK new signal mask stored in set argument
9. (6 points) Give at least two different examples of sending signal using the command prompt

Solution: kill -HUP 3 kill -9 3 kill SIGKILL 3 kill KILL 3 kill s KILL 3