

CSSE 332 -- OPERATING SYSTEMS

Signals

Name:

SOLUTION KEY

Question 1. (5 points) When running a program in a shell and you press the `ctrl-c` key combination on your keyboard, which signal is sent to the running process? What is the default behavior of the process upon receiving this signal?

Solution: Hitting `ctrl-c` sends the *interrupt* signal to the running process (`SIGINT`). By default, it causes the process to terminate.

Question 2. Assume that in our system, we have three processes P_1 , P_2 , and P_3 . At one point in time, both P_2 and P_3 send the *stop* signal to P_1 .

(a) (5 points) Assume that P_2 sends P_1 the signal **before** P_3 sends its signal. In this case, it is guaranteed that P_2 's signal will be delivered before P_3 's signal.

A. True.

B. False.

(b) (5 points) Assume now that P_1 received P_2 's signal but has not processed (or handled) it yet. Which of the following statements is true when P_3 's signal is received?

A. P_3 's signal will be queued until P_2 's signal is handled by the receiving process.

B. P_3 's signal will be bundled with P_2 's signal since they are of the same type.

C. P_3 's signal will be discarded.

Question 3. (5 points) List and explain the five actions that can be taken by default when a process receives a certain signal.

Solution:

1. Terminate: Kill the process.
2. Dump: Terminate and generate a core dump.

3. Ignore: see question below.
4. Stop: Pause the process.
5. Continue: Continue a paused process.

Question 4. (5 points) Explain the main difference between an *ignored* signal and a *masked* signal.

Solution: An ignored signal is consumed and discarded while a masked signal is stored (only one of a certain type) to be handled later when the process chooses to unmask it.