



TUTORIAL #7: Signals and Data Structures

**Faculty of Engineering and Applied Science
Operating Systems SOFE-3950U**

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Conceptual Questions

1. What are signals, what is their purpose?

A signal is an interrupter that the system requires to send to a process. Their main purpose is to report exceptional situations to an executing program. Some signals report errors such as references to invalid memory addresses; others report asynchronous events.

2. Explain the following signals: SIGINT, SIGTSTP, SIGCONT how can they be used to suspend, resume, and terminate a program?

- **SIGINT** - Standing for signal interrupt, This is where the signal interrupts the current process from the keyboard. The default action is to terminate the process.
- **SIGSTP** - Standing for a Singal to Stop, This is where the Signal is sent to a process that pauses it in the current state. The default action is to Suspend the process.
- **SIGCONT** - Standing for a Singal to Continue, This is where the Signal is sent to process to resume it. The default action is to Resume the process.

3. Explain the following functions: kill(), waitpid() how can they be used to terminate a process and wait until it has ended before continuing?

- **Kill** - function sends a signal to a process to terminate its specified by its pid.
- **Waitpid** - The wait() system call suspends execution of the current process until one of its children terminates.

4. Explain what a linked-list (queue) is, what does FIFO mean? What are the common operations that a linked-list must have?

- A linked list is a group of cells connected together by each other's ids one at a time. The first node is linked to the first cell and the tail is connected to the second cell.
- **FIFO** is a property que data structure, it stands for First In First Out which means the first item in que is the first item to be addressed
- **Linked List** is able to add, remove, and identify cells

5. Explain the structure of a linked-list as implemented in C, explain how would you implement the operations to add and remove values from the queue?

The Structure of Linked List in C is A linked list is a group of cells connected together by each other's ids one at a time. The first node is linked to the first cell and the tail is connected to the second cell. The insertion operation is conducted by first locating the position of the data in the list and then allocating the tail of the previous node to the node you want to add the head of the node that came after the index. To delete a node from a linked list you must identify the node and then remove the tail of the index node previous to it. Then you have to delete the head of the selected node to the previous node to the selected node and then remove the selected node.