# Homework 1

## 2.1 What is the purpose of system calls?

### Answer:

The purpose of system calls is so programmers and applications can access hardware capabilities without actually interfacing with the hardware. System calls also prevent programmers from causing any security issues or deadlocks that can arise from making direct contact with their code.

## 2.2 What are the five major activities of an operating system with regard to process management?

### Answer:

- Creation and deletion of user and system processes
- The scheduling of processes
- Provision of synchronization
- Provision of communication
- Provision of deadlock handling for processes

## 2.13 Describe three general methods for passing parameters to the operating system.

### Answer:

Three general methods of passing parameters to the operating system are:

- Passing them to registers
- Store in a block and pass the address of the block into the register as a parameter
- Parameters can be pushed onto the stack and popped off by the operating system

## 2.18 What are the two models of interprocess communication? What are the strengths and weaknesses of the two approaches?

### Answer:

- **Message Passing Model**
  - **Pros:** No conflicts to avoid and easier implementation
  - **Cons:** Only small amounts of data can be passed at a slower speed
- **Shared-Memory Model**
  - **Pros:** Large amounts of data can be passed at great speeds
  - **Cons:** Security and synchronization

**2.21 What is the main advantage of the microkernel approach to system design? How do user programs and system services interact in a microkernel architecture? What are the disadvantages of using the microkernel approach?**

**Answer:**

- **Main Advantage:** By using the microkernel it is easier to add more functionality to the operating system (extending the OS) without having to modify its kernel.
- **How programs and system services interact:** User programs and system services interact with each other through messages sent to the kernel. The kernel acts as a communication facilitator.
- **Disadvantages:** There's a performance decrease in system function overhead.