Name: Duvvuri Venkata Sai Sri Hari
SJSU ID: 014533571
180 C Assignment

Referenced Textbook: Operating Systems Concepts, by Silberschatz, Galvin and Gagne

2.12-

Q. The services and functions provided by an operating system can be divided into two main categories. Briefly describe the two categories, and discuss how they differ.

A. The services and function provided by operating system can be divided into 2 main categories

First set of services provide functions that are helpful to the user. They are more inclined towards helping the users for easy access and control of the system. The main function types include

1. **User Interface**
2. **Program Execution**
3. **I/O Operation**
4. **File Manipulation**
5. **Communication and Error Detection**

Second Set of Operations are essential for efficient operation of the system but not for helping the user. Systems with multiple have higher efficiency when they share the resources. They include operations like

1. **Resource allocation**
2. **Accounting.**
3. **Protection and security.**

So they differ by the function that one is essential for user friendliness and other is essential for efficient working of the system

2.13-

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

A. Parameters can be passed to the operating system in 3 types

1. **By Register**
2. **By Block or Table in Memory**
3. **By Stack**

By Register: This is the easiest way of transferring parameters. The parameters are loaded into the registers

By Block: When the parameters are more in number than the number of registers, then they are passed in blocks in Memory. Then the address of the block is passed a parameter in the register.

By Stack: Parameters can be pushed onto the stack by the program and popped off the stack by the OS.

2.15-

Q. What are the five major activities of an operating system with regard to file management?

A. The main major activities of an operating system with respect to file system are

1. **Creation and Deletion**
2. **Open**
3. **Read, Write and Reposition**
4. **Close**
5. **Get and Set file attributes**

Create ( ) and Delete ( ) are used for creation and deletion of files along by specifying the names of the files

Open ( ) function is used to open the file by specifying the file name.

Read ( ), Write ( ) and Reposition ( ) functions are used for reading, writing and rewind/skip to end of file respectively

Close ( ) is used to close the file which we are not using

Get file attributes ( ) and Set file attributes( ) are used for modifying and view the various file attributes like name, type and protection codes.

2.18-

Q. What are the two models of inter process communication? What are the strengths and weaknesses of the two approaches?

A. There are two models of inter process communication

1. **The message passing model**
2. **The shared-memory model**

In the message passing model the communicating process exchanges messages with one other for information transfer. Messages can be exchanged between the processes either directly or indirectly through a common mailbox. Before communication can take place, a connection must be opened.
In the shared-memory model, processes use shared memory create() and shared memory attach() system calls to create and gain access to regions of memory owned by other processes

Advantage and Disadvantages of models are:

For Message model it is useful for exchanging smaller amounts of data, because no conflicts need be avoided. So it is easier to implement than shared memory model. Shared memory model provides high speed and convenience of communication.

Higher speed is not possible in Message model of communication. And in the Process sharing memory problems arise in Areas of protection and synchronization.

2.21-

Q. 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?

A.

One advantage of the microkernel approach is that it makes extending the operating system easier. All new services are added to user space and consequently do not require modification of the kernel.

Communication is provided through message passing. microkernel. The main function of the microkernel is to provide communication between the client program and the various services that are also running in user space. The communicating process exchanges messages with one other for information transfer.

The disadvantage of microkernel approach is that the performance of microkernel is low as due to increased function overload.