**Viva Preparation for Operating Systems Course LAB**

**Bahria University, Lahore Campus**

**Department of Computer Sciences**

**Operating System Lab Journals**

**Course Code: CSL-320**

**Spring 2024**

**Name: [student Name]**

**Enroll No: [student Enrollment Number]**

**Viva Objective:**

**The objective of this viva is to assess the understanding of core concepts and practical applications covered in the Operating Systems Lab. This includes threads, process scheduling, memory management, inter-process communication, signal handling, and basic shell programming.**

**Lab Journal 01**

**Date:** 21-09-2023  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* To understand basic concepts of Operating System.

**Lab Tasks:**

1. What is an Operating System?
2. Which OS is being used in the Lab?
3. Install VMWARE and UBUNTU on your laptops.
4. What is a Virtual Machine? Differentiate between Guest and Host OS.

**Lab Journal 02**

**Date:** 2/29/2024  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* To study and execute the commands in Linux.

**Lab Tasks:**

1. Execute the Date Commands and write the output.
2. Execute the mentioned LINUX Commands and generate output.
3. Execute the below File Commands and write the output.
4. Execute FILTERS AND PIPES commands and write the output.

**Lab Journal 03**

**Date:** 03-07-2024  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* Understanding of Shell Programming.
* Understanding of variables, loops, operators.

**Lab Tasks:**

1. Write the output of programs for LINUX variables.
2. Write a program to calculate the addition, subtraction, multiplication, and division of numbers. 3.1 Write a program that compares two numbers if a is greater than b it displays “a is greater than b”, otherwise it displays that ‘a is not equal to b’. 3.2 Write a program that compares two numbers to check whether the numbers are equal, a is greater than b or a is less than b.
3. Write a program using “case” that inputs a fruit from the user and displays “Apple pie” on the input of apple, “I like banana” on the input of banana and “New Zealand famous for kiwi” on the input of kiwi.

**Lab Journal 04**

**Date:** 12-10-2023  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* To study loops, arrays, strings, file testing, positional parameters.

**Lab Tasks:**

1. Write a program to display the numbers from 10 to 20 in reverse order using for loop.
2. Write the output of the programs of Array.
3. Write the output of the File Testing Program.
4. Write a shell program to compare the two strings, whether the strings are equal or not.

**Lab Journal 05**

**Date:** 29-10-2023  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* To write a program to create a process in LINUX.
* To understand exec process.
* To create child with sleep and wait command.
* To understand getpid() and getppid().

**Lab Tasks:**

1. Write the program for process creation using fork command.
2. Write a program illustrating the sleep command during process creation.
3. Write a program illustrating the wait command during process creation.
4. Write a program in C to create two processes Parent and Child through fork.

**Lab Journal 06**

**Date:** 03-28-2024  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* To understand how the processes will cooperate by communicating with each other using the approach called as shared memory approach.

**Lab Tasks:**

1. Write the steps for sharing a common memory segment.
2. Write the functions required for creating, attaching, detaching, and removing the memory segment.
3. Write a program in C to perform communication between parent and child through shared memory.
4. Write a program that creates a shared memory segment and waits until three other separate processes write something into that shared memory segment after which it prints what is written in shared memory.

**Lab Journal 07**

**Date:** 05/02/2024  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* To write a C program to implement the CPU scheduling algorithm for First Come First Serve.
* To write a C program to implement the CPU scheduling algorithm for Shortest Job First.

**Lab Tasks:**

1. Calculate the Average Time using FCFS Algorithm.
2. Write the program for First Come First Serve scheduling algorithm.
3. Calculate the Average Time using SJF Algorithm.
4. Write the program for Shortest Job First scheduling algorithm.

**Lab Journal 08**

**Date:** 11 Nov 2023  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* To write a C program to implement CPU scheduling algorithm for Priority Scheduling and Shortest Remaining Time First.

**Lab Tasks:**

1. Write a C program to implement Priority Scheduling algorithm.
2. Write the output of a C program for Shortest Remaining Time First.

**Lab Journal 09**

**Date:** 5/16/24  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* To write a C program to implement CPU scheduling algorithm for Round Robin.

**Lab Tasks:**

1. Calculate the Average Time using Round Robin. Draw the GANTT Chart.
2. Write the output for Round Robin Scheduling Algorithm.

**Lab Journal 10**

**Date:** 5/23/2024  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* To study about Signal Handling. Use top, ps, and Kill commands.

**Lab Tasks:**

1. Write the output for top and ps. Differentiate between the both terms.
2. Write the output for the use of aux with ps for the firefox program.
3. Write the output of program for Kill Signal for firefox. 4.1 Write a C program with an infinite loop and a custom signal handler to handle the interrupt signal (Ctrl+C). 4.2 Write a program in C with an infinite loop and a custom signal handler to handle at least kill -15 (SIGTERM) and kill -9 (SIGKILL). Send both these signals (kill -9 and -15) using your running process’s PID.

**Lab Journal 11**

**Date:** 05/30/24  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* Understanding of threads, creation of threads, passing arguments to threads and to joining threads.

**Lab Tasks:**

1. Create a simple program for thread creation and termination. The created thread should display “I am child thread”.
2. Write a program that creates a number of threads and each thread should print “Hello World!” along with its number passed as argument in a thread.
3. Write the output of the program for the difference between processes and threads. Check the values of Global and Local variables in threads and processes. 4.1 Write a program to create two threads. One should take input from user and stores the factorial of that input. Other should take two variable base and power, calculate power. 4.2 Create ten threads. A global variable is declared sum. As each thread is created a function is called to calculate the sum of number from 1-10.

**Lab Journal 12**

**Date:** 6/06/24  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* To understand the use of semaphores and how they are used in process synchronization.

**Lab Tasks:**

1. Write a program to create two processes that share a common variable using a semaphore to synchronize access.
2. Write a program to implement the Producer-Consumer problem using semaphores.
3. Write a program to implement the Reader-Writer problem using semaphores.

**Lab Journal 13**

**Date:** 6/13/24  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* To understand the implementation of Deadlock avoidance using Banker's Algorithm.

**Lab Tasks:**

1. Write a program to simulate Banker's Algorithm for Deadlock avoidance.
2. Write a program to detect Deadlock in a given set of processes.

**Lab Journal 14**

**Date:** 6/20/24  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* To understand paging and segmentation in memory management.

**Lab Tasks:**

1. Write a program to simulate Paging in memory management.
2. Write a program to simulate Segmentation in memory management.

**Lab Journal 15**

**Date:** 6/27/24  
**Max Marks:** 20  
**Faculty’s Name:** Abdullah

**Objective(s):**

* To understand file systems and how they are managed in an operating system.

**Lab Tasks:**

1. Write a program to simulate the creation and deletion of files.
2. Write a program to simulate the management of file permissions.