LABORATORY HANDOUT

OPERATING SYSTEM LAB (COM-312)

CSE-3RD SEMESTER

ACADEMIC YEAR (2024-25)

Azra Ashraf

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Department of Computer Science & Engineering

Department of Computer Science & Engineering

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www.mietjmu.in

Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
CSE-312	Operating System Lab	PCC	2	0	0	4	50	-	50

COURSE OUTCOMES

	At the end of the course the student will be able to:
CO1	Develop competence in shell scripting on Linux operating system.
CO2	Use system commands to manipulate files, determine and control resource usage and perform administrative tasks.
CO3	Understand the architecture of the Linux operating system and its different subsystems.
CO4	Develop programs making use of Linux system calls to solve given problems.
CO5	Program complex inter-process interactions involving communication and synchronization.

LIST OF EXPERIMENTS

S.No.	Title
1	Practice basic bash, IO redirection, pipe, file and directory operations, searching files, process management and vi/nano editor commands.
2	Use the date and who commands, in one line, such that the output of date is displayed on the screen and the output of who is redirected to a file. Write a sed command that swaps the first and second words in each line in a file.
3	Write a shell script that takes a command line argument and reports on whether it is a directory or a file. Write a shell script that takes file names as arguments and convert all of them to uppercase.
4	Write a shell script that determines the period for which a specified user is working on the system. Write a shell script that displays all the lines between start and end line numbers passed as argument. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
5	Write a shell script and C program to perform the following string operations: ● To extract a substring from a given string. ● To find the length of a given string. Compare the running time of above shell script and C program using the time command.
6	Write a C program that takes, as a command line argument, the number of megabytes of memory it will use and during execution it should consume that much memory. Observe memory usage during program execution using free command.
7	Write a CPU bound C program and a I/O bound C program and observe the effect of their CPU share using the top command and its variants.
8	Observe and understand the process map of the previous two lab programs using pmap command.

9	Write a program in C that creates a child process, waits for the termination of the child and lists its PID.
10	Write a C program to print the address of a variable and enter a long loop (say using while(1)). Start three to four processes of the same program and observe the printed address values.
11	Write C Program to demonstrate wait and signal operations in semaphores. Implement consumer-producer problem using semaphores.
12	Implement pipe processing using IPC.
13	Develop applications in IPC using shared memory concept and message queues.

ADDITIONAL WEB RESOURCES

1.	VLAB LINK: Operating Systems by IIT Bombay which gives hands-on experience to the students. https://cse02-iiith.vlabs.ac.in/
2.	VLAB LINK: Operating Systems by IIT Kharagpur which gives hands-on experience to the students. http://oslab-iitkgp.vlabs.ac.in/
3.	VLAB LINK: Operating Systems by Amrita University which gives hands-on experience to the students. https://oslab.amrita.edu/
4.	VLAB LINK: Operating Systems by NIT Kurukshetra which gives hands-on experience to the students. http://vlabs.nitkkr.ac.in/os/

LAB REPORT INSTRUCTIONS

- Provide specific title of the lab experiment.

- Theory: Provide a concise abstract (typically 100-200 words) that summarizes the purpose, methods, key findings, and significance of the experiment.

- Materials/ Equipment: List all materials, components, and equipment used in the experiment. Include specifications when applicable.

- Software/Simulation Tools:

- Experimental Procedure: Describe the step-by-step procedure for conducting the experiment. Be detailed and clear in your instructions. Include diagrams or schematics to illustrate the setup, connections, and component placement. Explain any variations or adjustments made to the standard procedure.

- Observation & Calculations/Analysis: Detail the data you collected during the experiment. Include descriptions of measurements and any calculations made. Use tables, charts, or graphs to present data clearly. Discuss any trends, patterns, or significant observations. Interpret the data in the context of the experiment's objectives. Ensure that all figures, tables, and equations are correctly labeled.

- Results: Summarize the key findings of the experiment. Present results in a clear and organized manner using tables and graphs. Include units of measurement and labels for data points.

- Conclusion: Provide a concise summary of the experiment's key points and outcomes.

GRADING AND ASSESSMENT

- **Continuous Evaluation**: 30 marks

- **Final Demo & Viva**: 10 marks

- **Attendance**: 10 marks

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- **Lab Overall Marks**: 50 marks

COURSE POLICIES

- **Attendance**: Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Late Submissions**: Manuals and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**

  Monday (12:05 PM - 12:55 PM)

  Friday (12:05 PM - 12:55 PM)

- **Contact Information**
  sukhmeet.cse@mietjammu.in

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RUBRICS FOR LAB CONTINUOUS EVALUATION

Parameters	Performance			
	Low	**Medium**	**High**	**Marks**
Execution of the Experiment	Student was not able to setup and conduct the Experiment completely	Student was able to setup and conduct the experiment but measurement/results/observations were not correct	Students was able to set and conduct the experiment and the measurement/results/observations were not correct	10
	0-2 Marks	3-6 Marks	7-10 Marks	
Record	Student was not able to describe the detailed procedure and could not record the measurement.	Student was able to describe the detailed procedure partially or with some inaccuracy.	Student was able to describe the detailed procedure accurately and record all measurements correctly.	10
	0-2 Marks	3-6 Marks	7-10 Marks	
Viva Voice	Students could not demonstrate sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva.	Students demonstrated sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva.	Students demonstrate strong knowledge of foundation, functional or applied aspects related to the experiment during viva	10
	0-2 Marks	**3-6 Marks**	**7-10 Marks**	
Total Marks				**30**