CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY
FACULTY OF TECHNOLOGY & ENGINEERING
Devang Patel Institute of Advance Technology and Research
Department of Computer Engineering

Subject Name: Operating System **Semester :** IV
Subject Code: CE248 **Academic year:** 2019-20

Practical List

Instructions:
ISO Practical Format: Aim, Software/Hardware Required, Knowledge Required, Theory, Algorithm/Flow chart, Program, Input and Output, Advantages and Disadvantages, Conclusion, Questions and Answers.

<table>
<tr><th>Sr. No.</th><th>Aim Of the Practical</th><th>Hrs.</th><th>LO</th><th>PO</th><th>PEO</th></tr>
<tr><td>1.</td><td>Working of Different Kernels:
A. UNIX Architecture
B. Types of OS- Linux, Unix, MAC, Window etc.
C. Flavors of LINUX</td><td>2</td><td>1</td><td></td><td></td></tr>
<tr><td>2.</td><td>Study of Unix Architecture and the following Unix commands with option:
<table>
<tr><td>User Access:</td><td>login, logout, passwd, exit</td></tr>
<tr><td>Help:</td><td>man, help</td></tr>
<tr><td>Directory:</td><td>mkdir, rmdir, cd, pwd, ls, mv</td></tr>
<tr><td>Editor:</td><td>vi, gedit, ed, sed</td></tr>
<tr><td>File Handling / Text Processing:</td><td>cp, mv, rm, sort, cat, pg, lp, pr, file, find, more, cmp, diff, comm, head, tail, cut, grep, touch, tr, uniq</td></tr>
<tr><td>Security and Protection:</td><td>chmod, chown, chgrp, newgrp</td></tr>
<tr><td>Information:</td><td>learn, man, who, date, cal, tty, calendar, time, bc, whoami, which, hostname, history, wc</td></tr>
<tr><td>System Administrator:</td><td>su or root, date, fsck, init 2, wall, shut down, mkfs, mount, unmount, dump, restor, tar, adduser, rmuser</td></tr>
<tr><td>Terminal:</td><td>echo, printf, clear</td></tr>
<tr><td>Process:</td><td>ps, kill, exec</td></tr>
<tr><td colspan="2">I/O Redirection (<, >, >>), Pipe (|), *, gcc</td></tr>
</table></td><td>4</td><td>1</td><td>2</td><td>7</td></tr>
<tr><td>3.</td><td>1. Write a shell script which calculates nth Fibonacci number where n will be provided as input when prompted.
2. Write a shell script which takes one number from user and finds factorial of a given number.</td><td>2</td><td>3</td><td>5</td><td>3</td></tr>
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	3. Write a shell script to sort the number in ascending order. (Using array).				
4.	**Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, stat, readdir, opendir.** 1. Write a program to execute fork() and find out the process id by getpid() system call. 2. Write a program to execute following system call fork(), execl(), getpid(), exit(), wait() for a process. 3. Write a program to find out status of named file (program of working stat() system call). 4. Write a program for "ls" command implementation using opendir() & readdir() system call.	2	1	4,3	8
5.	Process control system calls: A. The demonstration of fork() B. execve() and wait() system calls along with zombie and orphan states.	2	2	4,3	3
6.	Write a C program in UNIX to implement Process scheduling algorithms and compare. A. First Come First Serve (FCFS) Scheduling B. Shortest-Job-First (SJF) Scheduling C. Priority Scheduling (Non-preemption) after completion extend on Preemption. D. Round Robin(RR) Scheduling	4	1,3	3	1,6
7.	Thread management using pthread library. Write a simple program to understand it.	3	1,2	2,8	1,7
8.	Write a C program in UNIX to implement Bankers algorithm for Deadlock Avoidance.	2	3,2	6	2
9.	Write a C program in UNIX to perform Memory allocation algorithms and calculate Internal and External Fragmentation. (First Fit, Best Fit, Worst Fit).	2	3,2	6	2
10.	Thread synchronization using counting semaphores and mutual exclusion using mutex.	2	3	5,9	2,7
11.	Write a C program in UNIX to implement inter process communication (IPC) using Semaphore.	2	1	4,3	8
12.	Kernel space programming: Implement and add a loadable kernel module to Linux kernel, demonstrate using insmod, lsmod and rmmod commands. A sample kernel space program should print the "Hello World" while loading the kernel module and "Goodbye World" while unloading the kernel module.	3	2,3	5,7	3,8
	Total Hours	**30**			

Additional Practical(s):

1. To implement of Dinning Philoshopr problem

A. Dinning Phiolosphor

B. Reader-Writer

2. To implement Disk-Scheduling Algorithm(s).
3. H2O Building Problem
4. Dining Savages Problem
5. Sleeping Barber Problem