Home

Savitribai Phule Pune University Second Year of Artificial Intelligence and Data Science (2020 Course) 217524: Operating Systems Laboratory		
Teaching Scheme:	Credit	Examination Scheme:
Practical: 02 Hours/Week	01	Term Work (TW): 25 Marks

Prerequisite Courses: 110005: Programming and Problem Solving

Companion Course: 217525: Operating Systems

Course Objectives:
- To learn and understand process, resource and memory management
- To understand shell scripting and shell programming

Course Outcomes:
On completion of the course, learner will be able to–
CO1: Choose the best CPU scheduling algorithm for a given problem instance
CO2: Demonstrate interprocess communication
CO3: Apply deadlock avoidance algorithm
CO4: Compare performance of page replacement algorithms
CO5: Demonstrate the fundamental UNIX commands & system calls

All assignments from Group A are compulsory, any three from Group B and any one from Group C

List of Assignments

Group A

1. Given the list of processes, their CPU burst times. Display/print the Gantt chart for FCFS , SJF , Priority and Round Robin scheduling algorithm. Compute and print the average waiting time and average turnaround time
2. Implement producer-consumer problem with counting semaphores and mutex
3. Demonstrate Reader-Writer problem with reader priority or writer
4. Write a program to implement the Bankers Algorithm.
5. Write a program to implement page Replacement strategies (FIFO, LRU,Optimal)
6. Write a Program to implement paging simulation using Least Recently Used (LRU) and Optimal algorithm

Group B

1. Implement UNIX system calls like ps, fork, join, exec family, and wait for process management (use shell script/ Java/ C programming)Shell programming
2. Write a program to implement an address book with options given below: a) Create address book. b) View address book. c) Insert a record. d) Delete a record. e) Modify a record. f) Exit
3. Create a shell program to do mathematical operations.
4. Create a shell program to find string in a file using grep system call.

Group C

1. Inter process communication in Linux using Pipes
   Pipes: Full duplex communication between parent and child processes. Parent process writes a pathname of a file (the contents of the file are desired) on one pipe to be read by child process and child process writes the contents of the file on second pipe to be read by parent process and displays on standard output.

2. Inter process communication in Linux using FIFO
FIFOs: Full duplex communication between two independent processes. First process accepts sentences and writes on one pipe to be read by second process and second process counts number of characters, number of words and number of lines in accepted sentences, writes this output in a text file and writes the contents of the file on second pipe to be read by first process and displays on standard output.

Learning Resources

Text Books:

1. 1. Das, Sumitabha, UNIX Concepts and Applications, TMH, ISBN-10: 0070635463, ISBN-13: 978-0070635463, 4th Edition.
2. Kay Robbins and Steve Robbins, UNIX Systems Programming, Prentice Hall, ISBN-13: 9780134424071, ISBN-10: 0134424077, 2nd Edition
3. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, Operating System Concepts, WILEY, ISBN978-1-118-06333-0, 9th Edition

Reference Books:

4. Mendel Cooper, Advanced Shell Scripting Guide, Linux Documentation Project, Public domain.
5. William Stallings, Operating System: Internals and Design Principles, Prentice Hall, ISBN-10: 0-13-380591-3, ISBN-13: 978-0-13-380591-8, 8th Edition
6. Andrew S. Tanenbaum & Herbert Bos, Modern Operating System, Pearson, ISBN-13: 9780133592221, 4th Edition

e-Books:

1. https://tecmint.tradepub.com/free/w_wile48/prgm.cgi?a=1
2. https://tecmint.tradepub.com/free/w_pack42/prgm.cgi?a=1
3. https://repository.dinus.ac.id/docs/ajar/Operating_System.pdf

MOOC Courses:
https://nptel.ac.in/courses/106/105/106105214/

@The CO-PO mapping table

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	3	2	-	-	2	1	1	-	2
CO2	3	2	-	3	2	-	-	2	1	1	-	2
CO3	3	2	-	3	2	-	-	2	1	1	-	2
CO4	3	2	-	2	2	-	-	2	1	1	-	2
CO5	3	2	1	-	2	-	-	2	1	-	-	2