PUNE INSTITUTE OF COMPUTER TECHNOLOGY

DHANKAWADI, PUNE–43

LIST OF LAB EXPERIMENTS

ACADEMIC YEAR: 2023-24

Department: **Computer Engineering**
Class: **T.E.**
Subject Name: **Laboratory Practice-I**
Subject code: **310248**

Date: **17/07/2023**
Semester: **I**
Examination scheme:
Term Work: **25**
Practical: **25**

PART I: Systems Programming and Operating System	
Group A	
Expt. No.	**Problem Statement**
A1	Design suitable Data structures and implement Pass-I and Pass-II of a two-pass assembler for pseudo-machine. Implementation should consist of a few instructions from each category and a few assembler directives. The output of Pass-I (intermediate code file and symbol table) should be input for Pass-II.
A2	Design suitable data structures and implement Pass-I and Pass-II of a two-pass macro- processor. The output of Pass-I (MNT, MDT, and intermediate code file without any macro definitions) should be input for Pass-II.
Group B (Any Two Assignments from Sr. No. 4 to 7) (Programming language: C/ C++/ JAVA/ Python)	
B1	Write a program to solve Classical Problems of Synchronization using Mutex and Semaphore.
B2	Write a program to simulate CPU Scheduling Algorithms: FCFS, SJF (Preemptive), Priority (Non-Preemptive) and Round Robin (Preemptive).
B3	Write a program to simulate Memory placement strategies – best fit, first fit, next fit and worst fit.
B4	Write a program to simulate Page replacement algorithm.
PART II: Elective I (Any Two assignments from each elective subject are compulsory, all the assignments should be covered among different batch students)	
Internet of Things and Embedded Systems (Programming tools recommended: Raspberry Pi/Arduino Programming; Arduino IDE/Python Interfacing. Other IoT devices)	
1	Understanding the connectivity of Raspberry-Pi / Adriano with IR sensor. Write an application to detect obstacle and notify user using LEDs.
2	Understanding the connectivity of Raspberry-Pi /Beagle board circuit with temperature sensor. Write an application to read the environment temperature. If temperature crosses a threshold value, generate alerts using LEDs.
3	Understanding and connectivity of Raspberry-Pi /Beagle board with camera. Write an application to capture and store the image.
4	Create a small dashboard application to be deployed on cloud. Different publisher devices can publish their information and interested application can subscribe.

Human Computer Interface (Programming tools recommended: GUI in python)	
1	Design a paper prototype for selected Graphical User Interface.
2	Implement GOMS (Goals, Operators, Methods, and Selection rules) modeling technique to model user's behavior in given scenario.
3	Design a User Interface in Python.
4	To redesign existing Graphical User Interface with screen complexity.
Distributed System	
1	Implementation of Inter-process communication using socket programming: implementing multithreaded echo server.
2	Implementation of RPC Mechanism.
3	Simulation of election algorithms (Ring and Bully).
4	Implementation of Clock Synchronization: a) NTP b) Lamport's clock.

Subject Coordinator
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