Operating Systems Lab (CS 470):

Lab 2: Create in Linux/Unix using C/C++ a program to play tic-tac-toe.

Overview

Tic-tac-toe or Xs and Os is a paper-and-pencil game for two players who take turns marking the spaces in a three-by-three (or in general an n x n) grid with X or O. The player who succeeds in placing three (or n) of their marks in a horizontal, vertical, or diagonal row is the winner.

Instructions

Write a computer program which takes its input (see size of the grid) from the command line and using shared memory the two opponents are played by two different processes.

Notes

- The grid size should be provided as command line argument.
- The players will read the coordinates from the standard input (usually keyboard).
- Whoever is creating the shared memory is responsible to print on regular basis the content of the grid (i.e. after each new step).
- Whichever process wins the game will write that it's the winning process, while the other will write that it's the process who lost the game. In case of a draw, both process should write the outcome (see draw).
- The processes should be different programs and should not be necessarily created using fork().
- If fork() is to be used for the implementation and the game will happen between the child and the parent process the maximum grade will be 9/10 (see rubric below).
- System functions such as ftok(), shmget(), shmat(), shmdt() and shmctl() are encouraged to be considered to create and handle the shared memory between the processes.

Rubric

Task	Points
Error handling	2
Printing results	2
Implement the game with parent-child processes (using fork()) **OR**	5
Implement the game by two separate processes (not using fork())	6