

Project

The Producer-Consumer Problem (Due Date: Week14) (10 Marks)

The Producer/Consumer pattern is one of the most widely used patterns in multi-process synchronization problem. The project is divided into a theoretical part, discussing the pattern concept and how it works, and a practical part that simulates an environment with a problem to be solved using *The Producer/Consumer* mechanism .

The theoretical part is to cover some aspects of the Producer/Consumer pattern:

- Concept/Idea
- Problem
- Use in operating systems
- Semaphores as a solution

The practical part is to simulate the print jobs of a printer, one job at a time: either from *Producer* or *Consumer*.

- A shared object called a **Buffer**.
- Set1 of threads, producers, put data in the buffer with $\frac{1}{2}$ second delay.
- Set2 of threads, consumers, read data from the buffer with *one* second delay.

The table below shows the tasks required along with the marks allocated for each task.

Theoretical Part	Concept/Idea	1
	Problem	1
	Use in OS	1
	Semaphores as a solution	1
Practical Part	The classes needed in the program	1
	The operations on the shared object, Buffer	1
	Dealing with Race Condition	1
	Using a semaphore mechanism	1
A demonstration of your work		2

Project group: The project is to be done in groups of five.

Plagiarism: Only your original work is accepted. NO turning in someone else's work as your own.