

**Faculty of Engineering & Technology**

**Department of Electrical & Computer Engineering**

**ENCS3390: Operating System Concepts**

**First Semester, 2023/2024**

**Programming Task 3**

**Published: Jan 11, 2024. Due: Jan 28, 2024 by midnight.**

**Consider a system that has N processes, and M resources, and each resource has multiple instances.**

**You are provided with the following input files: [samples are attached]**

**Allocation.csv Represents the NxM allocation matrix.**

**Request.csv Represents the NxM request matrix.**

**Available.csv Represents the M available vector.**

**Your task is to:**

1. **Read the input files, and verify that the dimensions are consistent.**
2. **Detect whether or not there is a deadlock condition.**
3. **If the system is deadlocked, list the processes that are deadlocked.**
4. **If not, show a series of process executions that are possible without deadlock.**

**For this assignment, you may use any programming language of your choosing.**