Assigned: Wednesday, March 13, 2024 (Week 4).
Due: March 27, 2024 (Week 6).
Graded Points: 10%

Title: Implementing a Sparse Table Application

Objectives

1. Familiarity in dealing with real applications having huge space requirement,
2. Applying the dynamic allocation techniques learned in part 2,
3. Implementing Sparse Tables.

The Problem

Your task is to implement an automated program that can answer two basic questions in a university courses registration system :

1. List the courses taken by one student, and
2. List the students enrolled in a specific course

Your task is to implement the above system in the most efficient way with respect to space requirements. Only cells with data should be stored and retrieved.

Scenario

Consider the case of a sample University with 20 undergraduate colleges, each with 4 or more departments (up to 10 departments). Each department can offer up to 20 courses per semester and can have from 50 - 200 students. A sample scenario is :

 A University with 20 Colleges and No. of Departments are :
     4, 4, 6, 6, 6, 8, 8, 8, 10, 10, 10, 12, 12, 12, 14, 14, 18, 18, 20, 20)

Courses offered per departments :
10, 8, 12, 14 - 12, 8, 20, 18 - 10, 10, 12, 14, 16, 18 - 12, 12, 14, 16, 18, 18 - etc.

Programming Technology Used

The Java language is recommended for implementation as presented in class. You are committed to implement the techniques studied in the course while achieving the project goals.