EC504
Course Scheduler

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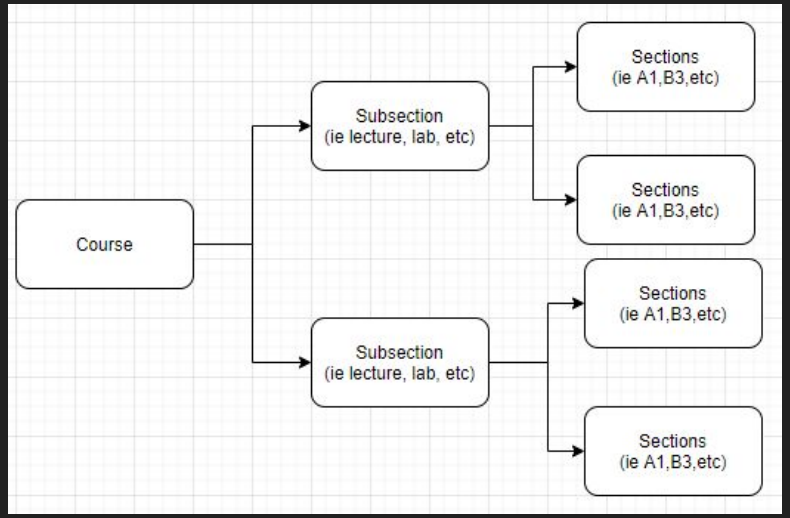
Project Description

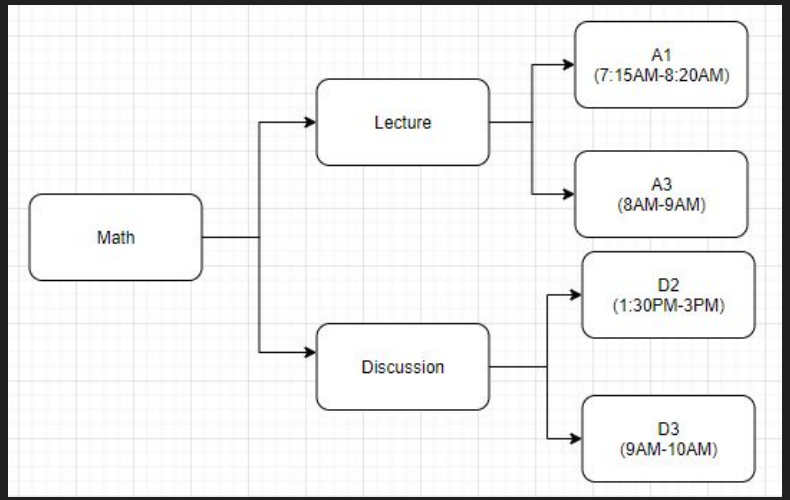
- **Who is this for?**
  - Students trying to decide what schedule options they have for courses they want
- **What do they want?**
  - All possible schedule combinations that don’t overlap for the courses they wish to take
- **What does the program do?**
  - The backend program uses an algorithm to calculates all possible combinations of the courses you want to take.
  - The frontend generates a graph styled schedule with your course lectures, discussion sections and labs (like the schedule graph in student link)

Visualizing the Algorithm

1) Enter course information
2) Filter 1 runs
3) Store Filter 1 results
4) Filter 2 runs
5) Store Filter 2 results
6) Output results to text file

# of Combinations = n!/(r!(n-r)!)
n = amount of possible classes (including various times)
r = how many classes we are enrolling in





Algorithm Description

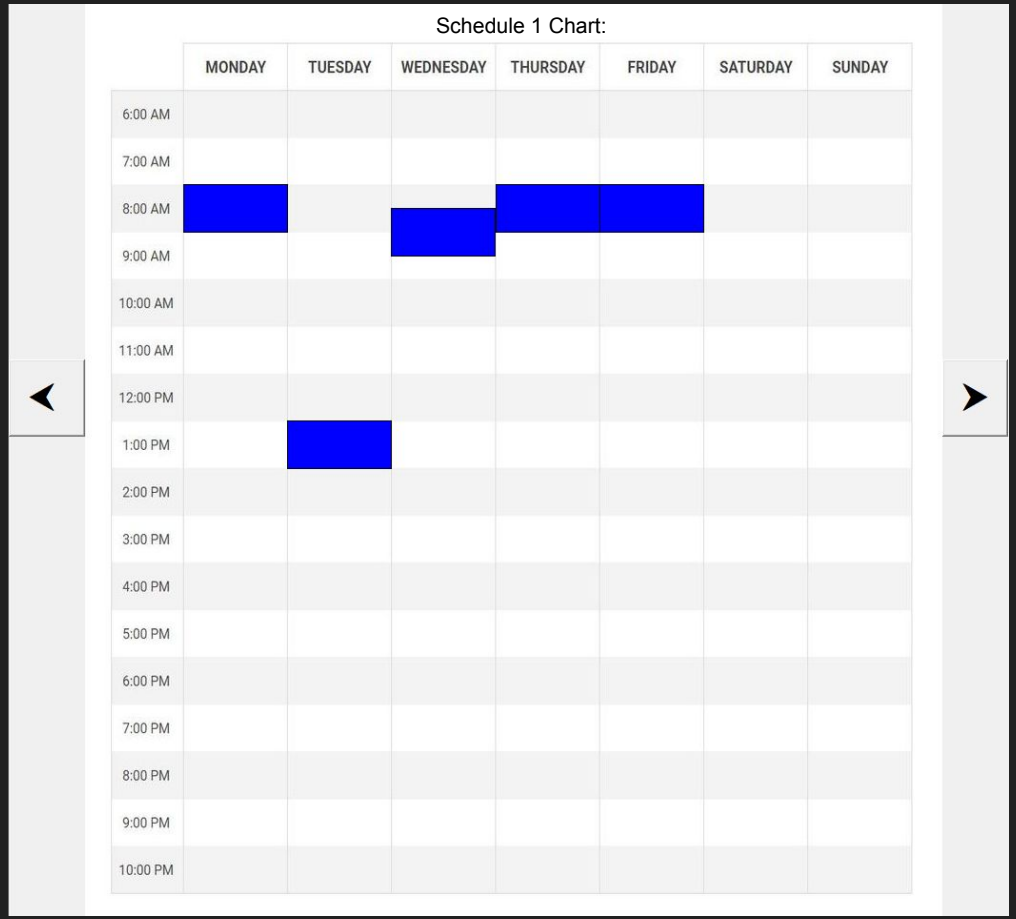
- Our algorithm starts by inputting the courses you want to take along with all the possible Lectures, Discussion sections, and Labs for each course
- It then stores the Course sections into nested integer vectors that contain assigned section ID numbers
- These nested vectors act like a tree that we retrace to find the necessary data for viable combinations of Course sections
- Then our program calculates all possible combinations of each Courses' viable section combinations with one another and stores it in a further nested vector

Algorithm Filters

- The First filter checks the times and dates of the course sections to make sure they do not overlap, do not repeat an alternate order of an already stored possible combination, and do not have have any repeated subsections (ie lectures, discussions, labs).
- These viable combinations are then stored inside a nested vector
- The Second filter then calculates all possible combinations of all the Courses and their previously calculated viable section combinations together
- Then it compares their times and dates to make sure none overlap or repeat
- The viable results are saved into a triple nested vector containing identifier number to their corresponding class objects

Program Demo

Program Outputs



thesched.txt - Notepad

File Edit Format View Help

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Schedule 1:
math lecture A1: 1,8,9 |
math lab L2: 3,8.3,9.3 |
history lecture B2: 2,13,14 |
history lab H1: 4,8,9 |
history discussion d1: 5,8,9 |


Schedule 2:
math lecture A1: 1,8,9 |
math lab L2: 3,8.3,9.3 |
history lecture B2: 2,13,14 |
history lab H2: 2,6,9 |
history discussion d1: 5,8,9 |


Schedule 3:
math lecture A1: 1,8,9 |
math lab L3: 2,7.3,8.3 |
history lecture B2: 2,13,14 |
history lab H1: 4,8,9 |
history discussion d1: 5,8,9 |


Schedule 4:
math lecture A2: 2,8,9 |
math lab L2: 2,8.3,9.3 |
history lecture B2: 2,13,14 |
history lab H1: 4,8,9 |
history discussion d1: 5,8,9 |
```

What our program accomplishes

- By using our program students will have an easier time picking courses by:
  - Filtering out the overlapping courses and making sure that all Lectures, Discussions, and Labs are included, so you don’t have to worry about missing sections
  - The Graphical GUI shows the students their schedule on a clean graph styled schedule that is easy to comprehend
  - Students will also have more schedule options to pick from, because our programs compares all possible combinations of the selected courses
- Overall students will get to see all the possibles ways they can create their own course schedule, possibly leading to improved mental health across a semester in which they were able to discover a schedule that best suits their sleeping habits