**USE CASE DESCRIPTION**

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| Use Case ID: | 1 | | | |
| Use Case Name: | Adding course indexes | | | |
| Created By: | Wei Lun | | Last Updated By: | Wei Lun |
| Date Created: | 02/09/20 | | Date Last Updated: | 02/09/20 |
| Actor: | | Student | | |
| Description: | | Allows users to specify the course indexes to plan the timetable for | | |
| Preconditions: | | None | | |
| Postconditions: | | Clicking of "Submit" button | | |
| Priority: | | High | | |
| Frequency of Use: | | High | | |
| Flow of Events: | | 1. User enters a course code or name 2. Dropdown suggestions are shown (See Use Case 1.1) 3. User selects one or more courses by repeating 1 and 2 4. User submits the entered courses for planning | | |
| Alternative Flows: | | 1.AC.1 (S4): If the user submits 0 courses   1. Display an error modal 2. Inform the user to select at least 1 course | | |
| Exceptions: | | 1.AC.1 (S4): If the user submits one or more unknown course code(s) / name(s)   1. Display an error modal 2. Inform the user of the violating course(s) | | |
| Includes: | | Use Case 1.1 | | |
| Special Requirements: | | None | | |
| Assumptions: | | None | | |
| Notes and Issues: | | None | | |

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| Use Case ID: | 1.1 | | | |
| Use Case Name: | Display dropdown suggestions | | | |
| Created By: | Wei Lun | | Created By: | Wei Lun |
| Date Created: | 02/09/20 | | Date Created: | 02/09/20 |
| Actor: | | None | | |
| Description: | | Allows users to specify the course indexes to plan the timetable for | | |
| Preconditions: | | Called by Use Case 1 | | |
| Postconditions: | | User selects an item from the dropdown list | | |
| Priority: | | High | | |
| Frequency of Use: | | High | | |
| Flow of Events: | | 1. Given the current text entered in the search bar, find a list of matching courses 2. Rank them by relevance (edit distance) | | |
| Alternative Flows: | | 1.1.AC.1 (S1): If the text matches no course in the database   1. Do not display a dropdown list | | |
| Exceptions: | | None | | |
| Includes: | | None | | |
| Special Requirements: | | Dropdown suggestions must be updated with an average latency of <0.1ms to ensure a fluid and responsive search interface | | |
| Assumptions: | | None | | |
| Notes and Issues: | | None | | |

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| Use Case ID: | 2 | | | |
| Use Case Name: | Generate all timetable combinations | | | |
| Created By: | Wei Lun | | Created By: | Wei Lun |
| Date Created: | 02/09/20 | | Date Created: | 02/09/20 |
| Actor: | | Student | | |
| Description: | | Generates all timetable combinations with a given list of courses | | |
| Preconditions: | | Called upon form submission in Use Case 1 | | |
| Postconditions: | | None | | |
| Priority: | | High | | |
| Frequency of Use: | | High | | |
| Flow of Events: | | 1. Search the course database for all lesson timings of the given list of courses 2. Generate all timetable combinations via a naïve backtracking search 3. Perform early stopping upon violation to prune the search tree (See Use Case 2.1) | | |
| Alternative Flows: | | 2.AC.1 (S2): No valid combination can be found   1. Inform the user that no valid timetable could be found | | |
| Exceptions: | | 2.EX.1 (S2): Search runs for over 30 seconds   1. Display the combinations that have been found thus far | | |
| Includes: | | Use Case 2.1 | | |
| Special Requirements: | | None | | |
| Assumptions: | | None | | |
| Notes and Issues: | | None | | |

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| Use Case ID: | 2.1 | | | |
| Use Case Name: | Validate a timetable combination | | | |
| Created By: | Wei Lun | | Created By: | Wei Lun |
| Date Created: | 02/09/20 | | Date Created: | 02/09/20 |
| Actor: | | None | | |
| Description: | | Validate a timetable combination by detecting clashes | | |
| Preconditions: | | Called in Use Case 2 | | |
| Postconditions: | | None | | |
| Priority: | | High | | |
| Frequency of Use: | | High | | |
| Flow of Events: | | 1. Generate all pairs of lessons 2. For each pair, determine if their timings overlap 3. If yes, then this timetable combination is invalid | | |
| Alternative Flows: | | 1. None | | |
| Exceptions: | | 1. None | | |
| Includes: | | None | | |
| Special Requirements: | | None | | |
| Assumptions: | | None | | |
| Notes and Issues: | | None | | |

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| Use Case ID: | 3 | | | |
| Use Case Name: | Search for alternative indexes for a course on click | | | |
| Created By: | Wei Lun | | Created By: | Wei Lun |
| Date Created: | 02/09/20 | | Date Created: | 02/09/20 |
| Actor: | | Student | | |
| Description: | | Search for all alternative indexes for a course on click, and display all valid indexes on the timetable | | |
| Preconditions: | | Called on click of any lesson block in the timetable | | |
| Postconditions: | | None | | |
| Priority: | | High | | |
| Frequency of Use: | | High | | |
| Flow of Events: | | 1. Display all lessons from alternative indexes 2. Lessons from different indexes are color-coded | | |
| Alternative Flows: | | 3.AC.1 (S1): No valid alternative can be found   1. Inform the user that no valid alternative could be found | | |
| Exceptions: | | 1. None | | |
| Includes: | | None | | |
| Special Requirements: | | Lessons from all alternative indexes must be displayed instantaneously (<0.1s) | | |
| Assumptions: | | None | | |
| Notes and Issues: | | Overlap of a tutorial session of an index i with a lab session of another index j, and vice versa | | |