

User Manual: Smart Degree Planner

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1 Introduction

Smart Degree Planner generates potential semester-by-semester course schedules for Penn Engineering BSE majors. It uses live data from the Penn course catalog to determine course prerequisites and applies scheduling logic.

Requirements: Java Runtime Environment (JRE 11+), internet connection, `jsoup-1.16.1.jar` in `lib/` folder.

2 Running the Program

Compilation (Command Line): Navigate to the project root directory. Create a `bin` folder (`mkdir bin`). Compile using `javac` (use appropriate path separator `:` or `;`):

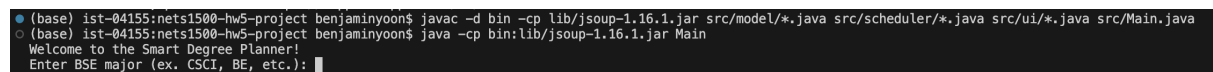
```
# macOS/Linux (Paste as one line):
javac -d bin -cp lib/jsoup-1.16.1.jar src/model/*.java
src/scheduler/*.java src/ui/*.java src/Main.java
```

```
# Windows (Paste as one line):
javac -d bin -cp "lib/jsoup-1.16.1.jar" src/model/*.java
src/scheduler/*.java src/ui/*.java src/Main.java
```

Execution (Command Line): From the project root directory:

```
# macOS/Linux:
java -cp bin:lib/jsoup-1.16.1.jar Main
```

```
# Windows:
java -cp "bin;lib/jsoup-1.16.1.jar" Main
```

A terminal window screenshot showing the compilation and execution of the Smart Degree Planner. The first command is `javac -d bin -cp lib/jsoup-1.16.1.jar src/model/*.java src/scheduler/*.java src/ui/*.java src/Main.java`, which runs successfully. The second command is `java -cp bin:lib/jsoup-1.16.1.jar Main`, which also runs successfully, displaying the message "Welcome to the Smart Degree Planner!" and a prompt "Enter BSE major (ex. CSCI, BE, etc.):".

```
(base) ist-04155:nets1500-hw5-project benjamin@yoon$ javac -d bin -cp lib/jsoup-1.16.1.jar src/model/*.java src/scheduler/*.java src/ui/*.java src/Main.java
(base) ist-04155:nets1500-hw5-project benjamin@yoon$ java -cp bin:lib/jsoup-1.16.1.jar Main
Welcome to the Smart Degree Planner!
Enter BSE major (ex. CSCI, BE, etc.):
```

Figure 1: Terminal showing program startup and first prompt.

3 Using the Planner (Functionality & Options)

The program runs as a command-line application with two main inputs (options):

1. **Enter BSE Major Code:** When prompted, enter a valid BSE major code (e.g., `csci`, `be`, `meam`, etc. - see list below) and press Enter. Type `exit` to quit.
 - Supported Codes: `arin`, `be`, `cbe`, `cmpe`, `csci`, `dmd`, `ee`, `mse`, `meam`, `nets`, `sse`
2. **Enter Max Courses Per Semester:** When prompted, enter a positive whole number (e.g., 4, 5) representing the maximum desired course load per semester, then press Enter.

```
Welcome to the Smart Degree Planner!
Enter BSE major (ex. CSCI, BE, etc.): CSCI
Max number of courses per semester (e.g., 5): 5
```

Figure 2: Example interaction: Entering major and max courses.

Program Operation (Functionality): After receiving input, the planner will:

- Scrape course data and prerequisites for the selected major from `catalog.upenn.edu` (may take time).
- Build an internal course dependency graph.
- Handle AND/OR prerequisite logic.
- Apply specific placement rules (e.g., for Writing Seminar, Senior Project Courses).
- Generate a recommended semester-by-semester schedule, attempting to balance the load according to your specified maximum.
- Detect and report basic prerequisite cycles.

Output: The final recommended schedule is printed to the console, listing courses semester by semester.

```
Welcome to the Smart Degree Planner!
Enter BSE major (ex. CSCI, BE, etc.): CSCI
Max number of courses per semester (e.g., 5): 5

Recommended semester-by-semester schedule for CSCI:
Semester 1: [Writing Seminar, CIS 1100, MEAM 1470, EAS 2030, CIS 1600]
Semester 2: [CIS 1200, CIS 2610, CIS 2620, MATH 1470, PHYS 0150]
Semester 3: [MATH 1400, PHYS 0151, CIS 2400, CIS 1210]
Semester 4: [MATH 1410, MEAM 1100, CIS 4480, CIS 4710, CIS 3200]
Semester 5: [MATH 2400, Senior Project I]
Semester 6: [Senior Project II]

Thank you for using Smart Degree Planner!
```

Figure 3: Example of final schedule output.

4 Troubleshooting

- **Invalid Major Code / No Courses Found:** Check the entered code against the supported list. Ensure internet connectivity.
- **Invalid Max Courses Input:** Enter a positive whole number.

- **Network/Scraping Errors:** Check internet connection; the catalog website might be unavailable or changed.
- **Scheduling Errors (Cycles, Cannot Find Eligible):** May indicate issues with catalog data consistency for the selected major.