# CSC111 Winter 2025 Project 1

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## Running the game

The game can be executed by running `python adventure.py`. No additional modules or installations are required.

## Game Map

```
Map Hierarchy:
          9
      5   8
      2
 4(7) 1  3[6]
 Where (7) denotes that 4(7) is a floor above 4, 3[6] denotes that [6] is a floor below 3.

Floors:
- (7) Engineering Lab is above 4 (Fleming Building)
- [6] Food Court is below 3 (Sidney Smith)
```

Starting location: 1 (Bahen Center Lobby)

## Game solution

List of commands (15 steps):

1. go north (to Robarts Library Entrance)
2. pick up usb drive
3. pick up library card
4. go south (Bahen Lobby)
5. go east (Sidney Smith Hall)
6. go down (Food Court)
7. pick up professor note
8. go up (Sidney Smith Hall)
9. go west (Bahen Lobby)
10. go north (Robarts Library Entrance)

11. go north (Robarts 3rd Floor)
12. pick up laptop charger
13. go east (Robarts Rare Books)
14. pick up lucky mug
15. go north (Dorm)

## Lose condition(s)

Players lose if they exhaust all 30 moves before reaching the dorm with required items.
**Code components:**

- `adventure.py`: `moves_left` attribute and termination check in main loop
- Movement logic in `process_command` and location transitions

## Inventory

1. Locations with items: 1, 2, 4, 5, 6, 8, 9
2. Item data:
   (a) USB Drive:
      - Start: 2 — Target: 9, win condition

   (b) Library Card:
      - Start: 2 — Target: 8, unlock Robarts Rare Books room

   (c) Professor Note:
      - Start: 6 — Target: 8, unlock Robarts Rare Books room

   (d) Laptop Charger:
      - Start: 5 — Target: 9, win condition

   (e) Lucky Mug:
      - Start: 8 — Target: 9, win condition

   (f) Lab Coat:
      - Start: 4 — Decoration

   (g) Handouts:
      - Start: 1 — Decoration

   (h) Laptop:
      - Start: 9 — Decoration

3. Commands:
   - Pick up: `pick up <item>`
   - Drop item: `drop item <item>`
   - Check inventory: `inventory`
4. Code components:

- `AdventureGame.pick_up_item()` (lines 95-116)
- `AdventureGame.drop_of_item()` (lines 118-126)
- Weight tracking via `get_current_weight()` (line 180)

5. Demo:

```
inventory_demo = [
    "go north", "pick up usb drive", "inventory",
    "drop item usb drive", "inventory", "go south",
    "pick up handouts", "inventory"
]
```

## Score

1. Players earn points by picking up items (e.g., +10 for USB drive)
2. Score demo commands:

```
score_demo = [
    "go north",  # 2
    "pick up usb drive",  # +10 points
    "score",  # Check score
    "go south",  # 1
    "go east",  # 3
    "pick up professor note",  # +15 points
    "score"  # Total 25
]
```

3. Code components:
   - `Item.target_points` attribute (`game_entities.py` line 83)
   - Score calculation in `AdventureGame` "score" handler (lines 159-161)

## Enhancements

1. Puzzle System for Locked Locations
   - Description: Locations like Robarts Rare Books (ID 8) require specific items to unlock. Players must collect prerequisites (library card + professor note) to access them.
   - Complexity: Medium
   - Implementation: Added `locked` and `required_items` attributes to Location class (`game_entities.py` lines 36-37). Modified movement logic in `adventure.py` (lines 200-208) to check prerequisites
   - Changed 40+ lines across 2 files
   - Demo:

```
enhancement2_demo = [
    "go north",  # Move to location 2 (Robarts Library Entrance)
    "go north",  # Move to location 5 (Robarts 3rd Floor)
    "go east",  # Attempt to move to location 8 (Robarts Rare Books) - locked
    "go south",  # Move back to location 2 (Robarts Library Entrance)
    "go south",  # Move back to location 1 (Bahen Center Lobby)
    "go east",  # Move to location 3 (Sidney Smith Hall)
    "pick up professor note",  # Pick up the professor note in location 3
    "go west",  # Move back to location 1 (Bahen Center Lobby)
    "go north",  # Move to location 2 (Robarts Library Entrance)
    "pick up library card",  # Pick up the library card in location 2
    "go north",  # Move to location 5 (Robarts 3rd Floor)
    "go east"  # Successfully unlock and move to location 8 (Robarts Rare Books)
]
```

2. Weight Management System

- Description: Players can carry max 1.5kg. Items have weights (USB=0.2kg, Mug=0.6kg). Must drop items to manage capacity
- Complexity: High
- Implementation: Added `weight` attribute to Items (`game_entities.py` line 84). Weight tracking in `pick_up_item()` (lines 104-109) and `get_current_weight()` (line 180). New drop command handling
- Changed 40+ lines across 3 files
- Demo:

```
enhancement1_demo = [
    "go north",  # 2
    "pick up usb drive",  # 0.2kg
    "pick up library card",  # 0.1kg (total 0.3)
    "go south",  # 1
    "go east",  # 3
    "pick up professor note",  # 0.1kg (total 0.4)
    "pick up philosophy textbook"  # 0.2kg (total 0.6) - under 1.5kg
]
```