

DUNGEONS & DEVELOPERS

Overview

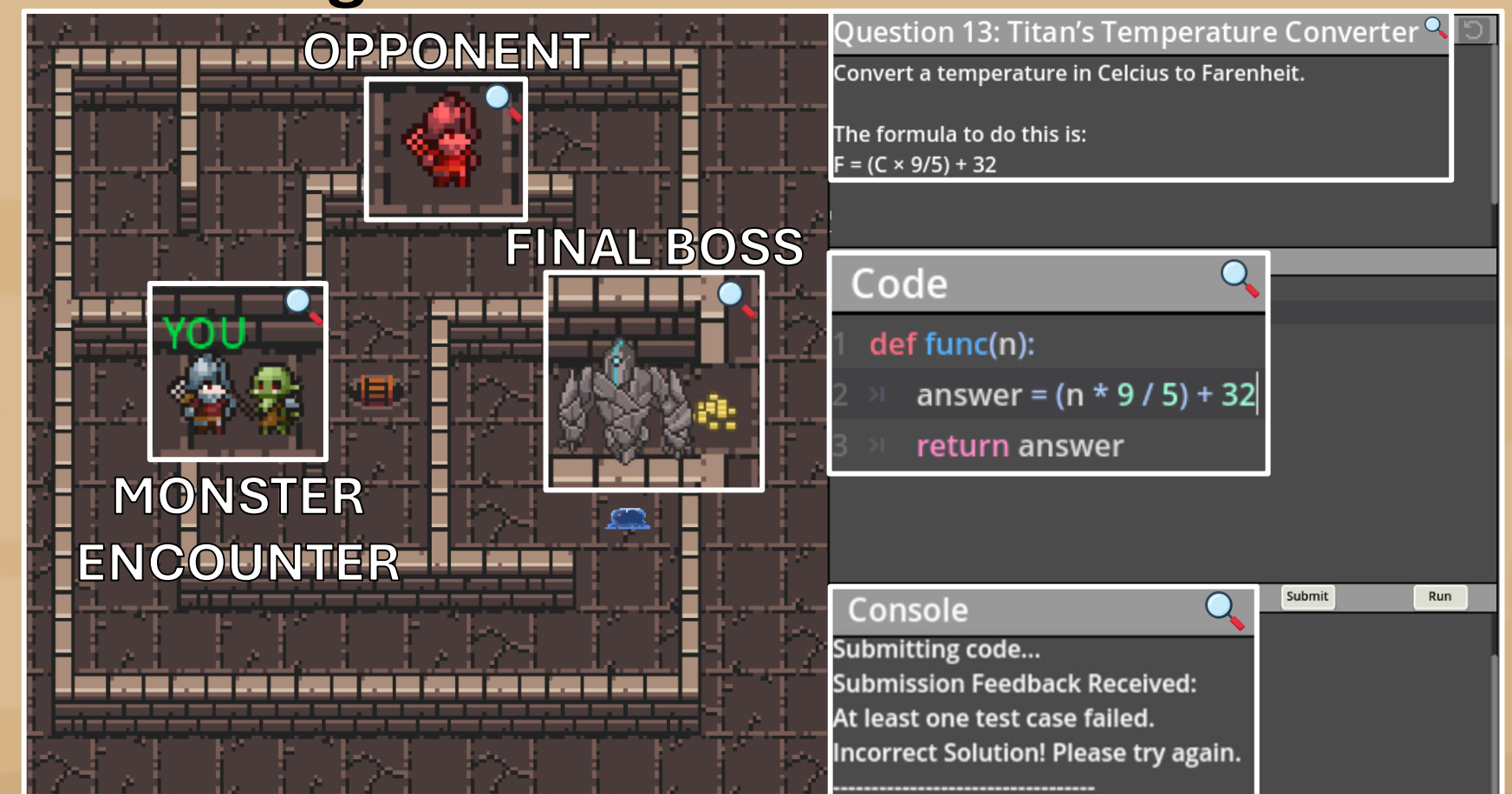
- 1st year Comp Sci students struggle with **motivation** and **engagement**.
- **Game-based Learning** is a promising solution.
- A web-based, **real-time competitive**, educational game was created to **evaluate its effect** on these issues.

1v1 Mode

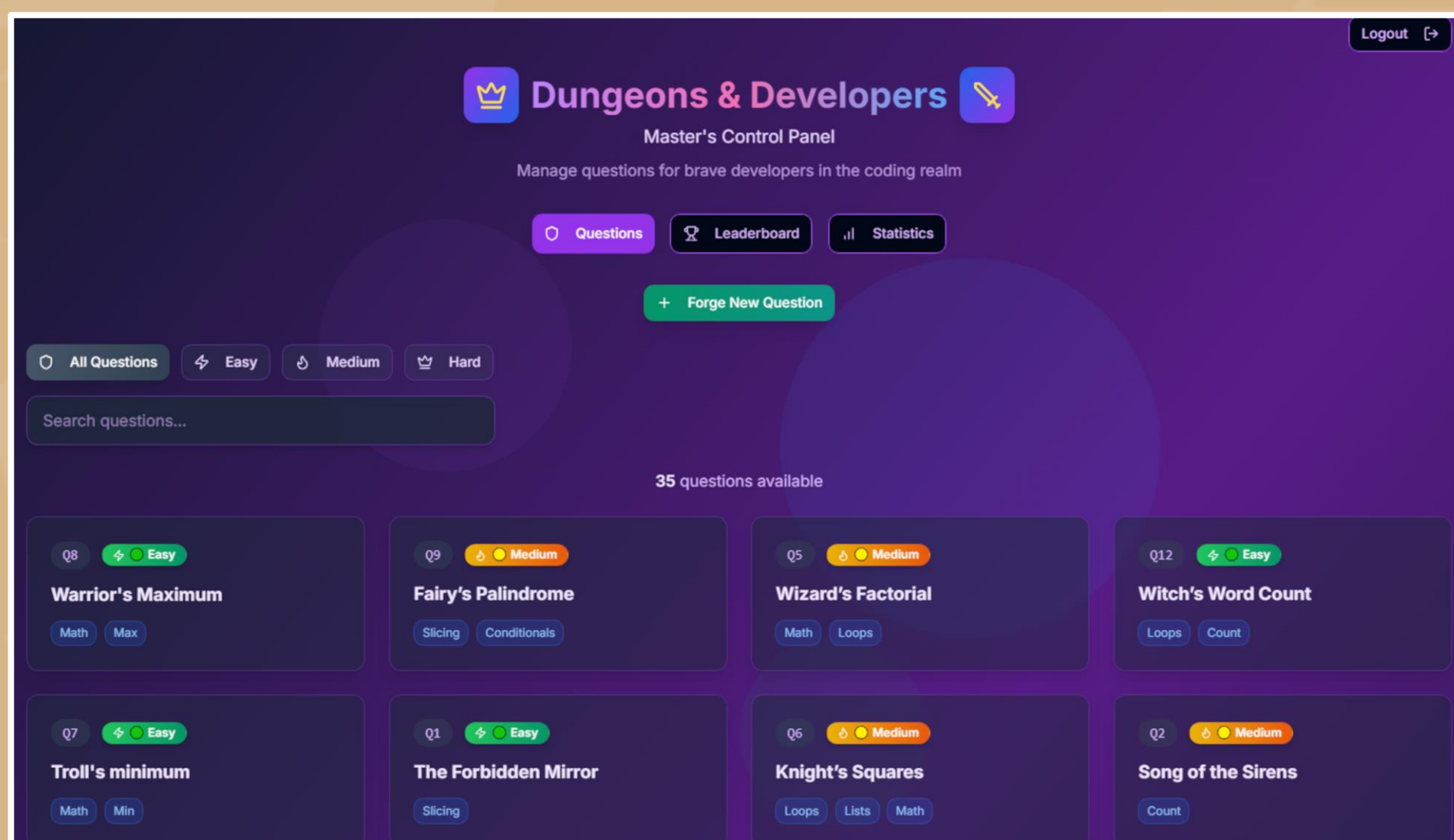
- Navigate procedurally generated **maze**.
- **Defeat monsters** using **Python**.
- Compete against **one other** player.
- Reach the **exit first** to **win!**
- **30+** easy, medium and hard questions.
- **Simple** code commands to traverse the maze.
- Opponent's position updates in **real-time**.
- Robust code interface with **syntax highlighting** and **detailed feedback**.
- Competitive **integrity** ensured by **identical** mazes and initial questions.

2v2 Mode

- Same game mechanics as 1v1 mode.
- Simulates **pair programming**:
 - **Driver** writes code.
 - **Navigator** assists via **voice** and **text chat**.



Backend & Admin Panel



Backend:

- **Compiles** and **evaluates** user submitted code against test cases.
- **Stores** all questions and leaderboard info for easy **update** and **retrieval**.

Admin Panel:

- Allows **full control** over the questions.
- **CRUD** questions from the database with **ease**.
- Monitor student **statistics** and track overall **performance** across questions & tags.

User Testing

- **High engagement** and **motivation** across **both modes**.
- **Significant interest** in playing game outside of user testing.
- Admin panel described as “**very easy to use**” by lecturers.

Results

UES Metric	1v1	2v2
Focused Attention	3.94	4.01
Perceived Usability	3.76	3.50
Aesthetics	4.28	4.06
Reward	4.59	4.43
Learning	4.50	4.23
Motivation	4.55	4.12

University of Cape Town

Department of Computer Science

Website: <https://sit.uct.ac.za>

Email: dept@cs.uct.ac.za

Tel: 021 650 2663

Supervisor:

Gary Stewart

gstewart@cs.uct.ac.za

Developers:

Ibrahim Abdou – ABDIBR008

Mahir Moodaley – MDLMAH007

Kai Connock – CNNKAT005