Motion Masters:

Project Goal:

Create a web based game where players will perform movements that will be detected via webcam, these specific movements will control gameplay mechanics to provide a fun, interactive and inspirational experience.

Game concept:

description:

- The player interacts with the game using body gestures captured via webcam
- The game will recognise specific poses and gestures such as, raising arms, peace signs, jumping
- Each individual motion will trigger an action in game such as swinging a sword making their character jump, moving an object, etc

Core gameplay loop:

1. Teachers will open the web app and allow camera access for their students.
2. Web cam will track body movements in real time.
3. The game will then map those gestures to specific in game actions.
4. Players will receive visual feedback on success of performed action.
5. The game will update based on their performed action.

Target audience:

Our project will be used in schools to help inspire the younger generations to get into computer science, therefore, our target audience will be students in years 5-6.

Minimum viable product:

MVP will include:

- Web app interface with access to webcam feed
- Real time gesture tracking
- Recognition of at least 1-3 gestures
- Visual feedback based on the gestures

Technical considerations:

Frontend:
- Html/css/Javascript for the UI

Pose detection:
- MediaPipe for detecting body gestures
- Performance consideration
- This will need to be used in schools and therefore can't be too intensive to run.
- Keep specs minimal

Requirements:

Functional requirements:
- Webcam access.
- Movement/gesture detection.
- Response to specific gestures.
- Display visual feedback based on performed gestures.

Non-functional requirements:
- Low latency
- Compatible with different screen sizes

Hardware requirements:
- Some form of camera or webcam, high enough fidelity to track movements properly

Risks and challenges:
- Accuracy of gesture detection due to camera quality, light level, etc
- Latency between movement and game response
- Ensuring it can work at any school location
- Detecting gestures reliably