Skyscraper Games by Kids

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Problem Statement

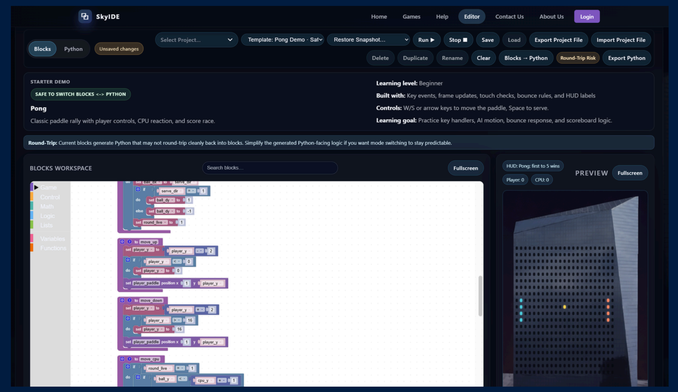
Skyscraper Games by Kids is an outreach initiative that introduces children to programming through interactive game design. Inspired by the Guinness World Record–winning Cira Centre games, the project aims to provide a web-based IDE where students can create and preview games using a beginner-friendly block programming interface. Selected games can then be displayed on a skyscraper-scale LED façade, combining education, creativity, and public engagement.

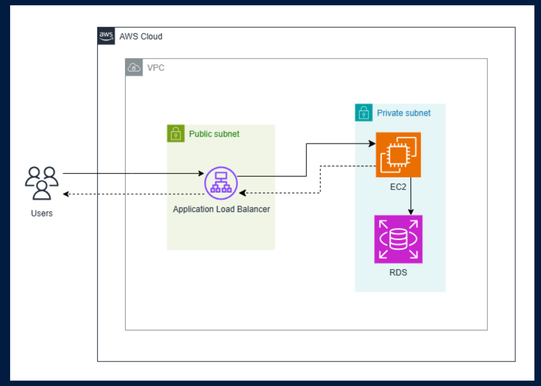
Project Goals

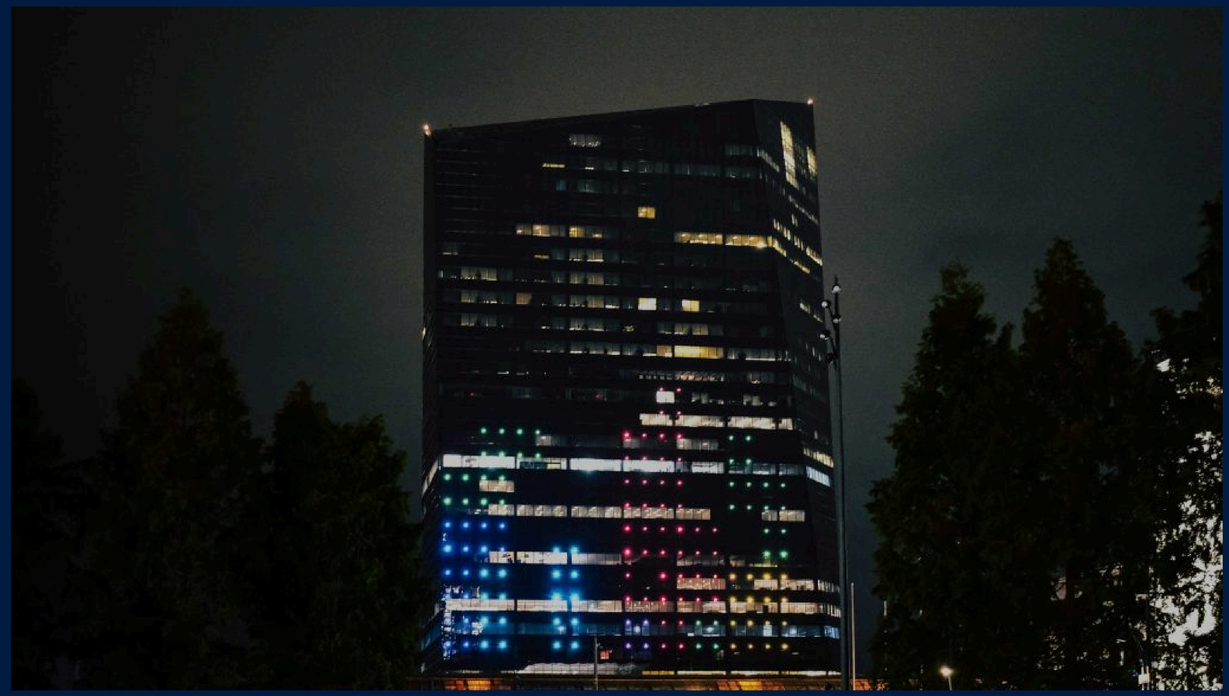
- Develop a web-based IDE accessible through standard web browsers
- Design an intuitive and visually engaging user interface for young learners
- Support both block-based coding and Python scripting within the IDE
- Enable real-time game simulation and preview functionality

Results

- Demonstrated functionality by displaying student-created games on the skyscraper-scale LED façade
- Implemented dual-mode coding with seamless two-way conversion between Blockly blocks and Python
- Successfully developed a web-based IDE accessible through browsers, requiring no installation or setup







System Architecture

- AWS Virtual Private Cloud (VPC) - allows for secure network isolation
- Application Load Balancer - distributes traffic from users to EC2 instances
- EC2 - runs both frontend and backend through PM2 process manager
- RDS - runs Postgres database
- React - Javascript framework used for the frontend
- Flask - Python web framework used for the backend API
- Blockly - Python package used to convert blocks to Python code and Python code back to blocks

Conclusion

- Demonstrated that programming can be made approachable and engaging for young learners
- Block-to-Python conversion supports a natural progression from visual to text-based coding
- Combines education, creativity, and public engagement by turning a city skyline into a canvas for kids' work