Sketch Hop

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Problems and tasks solved by this project

This project was meant to create a "Doodle Jump clone". The main problem this project solves is boredom. This problem is especially prominent in today's world. Between digitalization and the coronavirus pandemic, more people are spending time at home with a lot of free time. The project can also serve as a basic template for a platformer game and is suited to be expanded upon, as mentioned in the "How my work could be expanded upon" section.

Used methods, procedures and algorithms

I would firstly like to bring up the platform generation algorithm. The algorithm generates a random new platform within a "belt" above the active window, allowing the platforms to scroll down into view as the player jumps upwards. It checks if the newly generated platform is within jumping distance of at least one other platform (as to not make it useless) and if it is a set distance away from all other platforms (as to not spawn on top of an already existing platform).

Platforms scrolling off the screen are deleted as soon as they scroll down out of view, alleviating computation times when generating new platforms. Every platform that goes off the screen also adds 10 score to the players total score count.

Next I would like to talk about collision detection. The player snaps to the top of a platform as soon as their feet pass the bottom of a platform. This creates a smoother experience and prevents the player feeling cheated when they were "close enough" to a platform to touch it.

Results achieved

I've achieved to make a basic platformer game with animated player sprites, randomly generated platforms and booster power ups. I have implemented sounds to accompany movement and game state events. Movement calculations are based on physics equasions from the real world, for example acceleration and friction are both used when calculating where the player should move to. I haven't achieved adding monsters to the game due to time restrictions.

How my work could be expanded upon

I believe the main way my work could be used in the future is adding more features or functionality. From the addition of monsters, more power ups, different levels (Ice levels with sliding platforms, Windy levels that move the player without input…). Another way I can see my work being expanded upon is adding character with different traits, for example jump height, being able to glide or have a jetpack.

Adding scrolling backgrounds would make the game come more alive and possibly a mode where you can "race" other people in real time.

Sources

Knowledge and techniques used to develop this project was mainly taken from:

1. **Discussions with helpful information from Stack Overflow:**
   - What are the pygame.Surface.get_rect() key arguments? In: Stack Overflow. Posted 09.02.2016. [Seen 16.01.2021]. Available at:

     https://stackoverflow.com/questions/35304498/what-are-the-pygame-surface-get-rect-key-arguments
   - Pytest fixture - get value and avoid error "Fixture 'X' called directly". In: Stack Overflow. Posted 26.02.2019. [Seen 16.01.2021]. Available at:

     https://stackoverflow.com/questions/54886692/pytest-fixture-get-value-and-avoid-error-fixture-x-called-directly
   - How to implement button interaction for Main Menu (Pygame). In: Stack Overflow. Posted 29.07.2018. [Seen 16.01.2021]. Available at:

     https://stackoverflow.com/questions/51580173/how-to-implement-button-interaction-for-main-menu-pygame

2. **Documentation used for this project:**
   - Pygame Official documentation. In: Pygame tutorial Read the Docs. Posted 2019. Seen [16.01.2021]. Available at:

     https://pygame.readthedocs.io/en/latest/index.html
   - Pygame-menu Official documentation. In: Pygame-menu Read the Docs. Posted 2017. Seen [16.01.2021]. Available at:

     https://pygame-menu.readthedocs.io/

3. **Youtube playlist that this project was inspired by:**
   - Kids Can Code. Pygame Tutorial #2: Platformer. In: Youtube. Posted 31.01.2016. Seen [16.01.2021]. Available at:

     https://www.youtube.com/watch?v=uWvb3QzA48c&list=PLsk-HSGFjnaG-BwZkuAOcVwWldfCLu1pq&index=1

Pixel art used in this project sourced from:

- Pixel Adventure - Created by Pixel Frog. [Downloaded 16.01.2021]. Available at: https://pixelfrog-store.itch.io/pixel-adventure-1

Sound art used in this project sourced from:

- Jump sound or Power up sound - Created by Cman634. [Downloaded 16.01.2021]. Available at:
  https://freesound.org/people/Cman634/sounds/198784/
- Musical Game over. [Downloaded 16.01.2021]. Available at:
  https://mixkit.co/free-sound-effects/game-over/
- Cartoon metal hit, impact with fast ascending tail 1. [Downloaded 16.01.2021]. Available at:
  https://www.zapsplat.com/music/cartoon-metal-hit-impact-with-fast-ascending-tail-1/