CPSC 386 – Fall 2019

Introduction to Game Design & Production

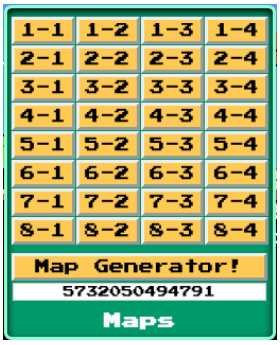
Project Four: Super Mario Brothers

due at beginning of class – 386-01: 30 Oct (W)
386-02: 1 Nov (F)

In this assignment, you will create the first two world levels of the classic Super Mario Brothers game. Note, there are four sublevels per world level, so you will be creating a total of 8 sub-levels. See the following full-screen Mario emulator from UTA for the best Super Mario emulator. It's keyboard response is excellent, and it has the best audio track of the emulators. It also has the ability to jump between levels rapidly, for testing your Super Mario game.

FULL SCREEN MARIO emulator from UTA

http://www.uta.edu/utari/acs/ASL_site/Homepage/Misc/Mario/index.html



- Classic Super Mario Brothers was released by Nintendo in 1985, and was enormously more complicated than Space Invaders. It had:
  A protagonist (Mario) that could move , and his moves were **animated**.
- Mario could walk, jump, slide, stop, crouch (only when big), throw (only when Fire Mario), stomp (enemies), break bricks with his head (only when big), and when swim (well, walk underwater). Of course, he can fall to his death.
- He could **transform** between different forms (Mario, Super Mario, Fire Mario, Invincible Mario), and had different abilities and dimensions.
- Many more types of enemies, some of whom used AI to chase Mario.
- More types of levels, with many obstacles.
- Side-scrolling levels, to allow Mario to explore a wider variety of of levels.
- Used Physics when he jumped or slid (take some of the Physics with a grain of salt, like being able to jump multiple times in the air, or the ability to change directions in the air).

- The ability to add more characters and levels.
- The ability to add a story to the game.
- Many more types of music (level x music, countdown music for finishing a level or being invincible, losing a player, winning a level, or losing the game).

For this project, your team will be creating a clone of Super Mario. Your basic goal is to create a game that looks and feels just like the original, 1985 game. When played by someone who is not part of our class, your game should be indistinguishable from the original game. Do NOT create different protagonists, antagonists, or levels.

Although you may use sprites and music that you find online (when given proper credit), all of your code must be your own. If you use code you find from the Internet, your project will receive a grade of zero, and all members of your group will receive that grade. If you are having trouble with this project, please email me or come to my office hours, so we can work through any difficulties you may be having.

For this project,

1. You will need PyCharm, Pygame, and Python 3 installed.
2. You should use the above-mentioned UTA site as guide for building your Super Mario game.
3. You may use sprite sheets that you find online, but you MUST appropriately attribute the source used.
4. You may use online music, but you MUST list the source used for the music or sounds.
5. You must include all of the Mario types that are in the original Mario 1985 game, including their abilities, movements, logic, and music.
6. You must include all of the world levels (world levels 1-1, 1-2, 1-3, 1-4, and 2-1, 2-2, 2-3, and 2-4) in the original game, including its characters, world logic, and music. For example, when jumping onto the flag pole at the end of the level, jumping onto the top of the flagpole receives more points than jumping onto the bottom. Similarly, if you finish the level early, you will receive additional points for how early you finished the level.
7. You must include all of the enemy characters shown in the original game, including their movements, logic, and music. For example, the Bloopers in level 2-2 will work together and chase Mario.
8. Push the contents of your project to a new GitHub repository using a git client(e.g.,the git command-line client, GitHub Desktop, or GitHub for Atom). Do not submit files using drag-and- drop onto the repository web page, and do not push this assignment to the same repository as your previous homework assignments.

Submission

Turn in the code for this homework by uploading all of the Python source files you created, the images directory, and the sounds directory to a single public repository on GitHub. While you may discuss this homework assignment with other students. Work you submit must have been completed on your own.

To complete your submission, print the following sheet, fill out the spaces below, and submit it to the professor in class by the deadline. Failure to follow the instructions exactly will incur a 10% penalty on the grade for this assignment.

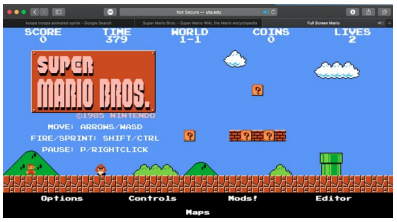
Levels

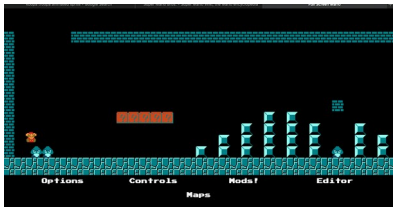
https://www.mariowiki.com/Super_Mario_Bros.#List_of_levels

Implement all four sub-levels of world levels 1 and 2,
i.e., world levels
1-1, 1-2, 1-3, 1-4 and
2-1, 2-2, 2-3, 2-4.

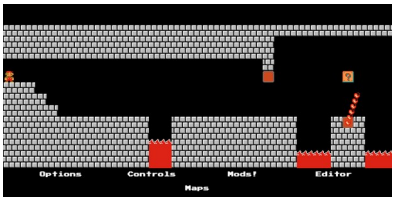
Level	Setting	Enemies found
World 1-1	Overworld	Little Goomba, Koopa Troopa
World 1-2	Underground	Little Goomba, Koopa Troopa, Piranha Plant
World 1-3	Athletic	Little Goomba, Koopa Troopa, Koopa Paratroopa
World 1-4	Castle	Fire-Bar, fake Bowser (Little Goomba)
World 2-1	Overworld	Little Goomba, Koopa Troopa, Koopa Paratroopa, Piranha Plant
World 2-2	Underwater	Blooper, Cheep-cheep, Piranha Plant
World 2-3	Athletic	Cheep-cheep
World 2-4	Castle	Fire-Bar, Podoboo, fake Bowser (Koopa Troopa)

World levels 1-1 and 1-2

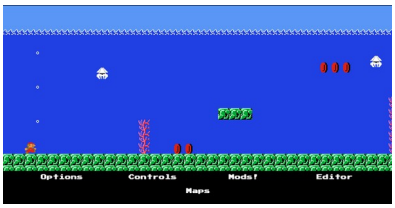


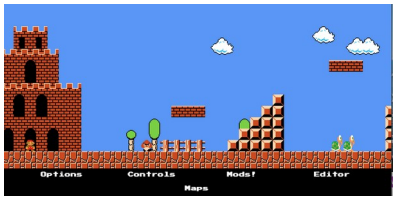


World levels 1-3 and 1-4

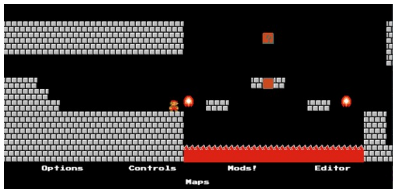


World levels 2-1 and 2-2





World levels 2-3 and 2-4
(yes, levels 1-4 and 2-4 look - very similar)



Hero and Transformations
https://www.mariowiki.com/Super_Mario_Bros.#Transformations

Mario
Super Mario
Fire Mario, and
Invincible Mario

Transformations

Mario	Requires touching an enemy or obstacle while in Super or Fiery form	▪ Weakest form used when a new game begins. ▪ Can lose a life by touching an enemy or obstacle.
Super Mario	Requires Magic Mushroom	▪ Gains the ability to break Brick Blocks. ▪ Reverts back into regular form by touching an enemy or obstacle.
Fiery Mario	Requires Fire Flower	▪ Gains the ability to throw fireballs to defeat enemies. ▪ Reverts back into regular form by touching an enemy or obstacle.
Invincible Mario	Requires Starman	▪ Becomes invincible for a short period of time. ▪ Immune to harm from any enemies or obstacles. ▪ Can defeat most enemies without jumping on them. ▪ Can still lose a life by falling into a pit or running out of time.

Items
https://www.mariowiki.com/Super_Mario_Bros.#Items

Coin, Magic mushroom,
Fire flower, Starman, and
1-up Mushroom.

Items

Coin	200 points	Very Common	Collecting 100 of them gives an extra life.
Magic Mushroom	1000 points	Uncommon	Gives the Super form.
Fire Flower	1000 points	Uncommon	Gives the ability to shoot fireballs.
Starman	1000 points	Rare	Gives invincibility for a moment.
1 up Mushroom	0 points	Rare	Gives an extra life.

Enemies (koopas)
https://www.mariowiki.com/Super_Mario_Bros.#Enemies

Koopa troopa, and
Koopa paratroopa

Goombas (in their appropriate colors)

Fireballs and Fire-bars

Bloobers (uses AI to chase Mario)

Cheep-cheeps

Koopa Paratroopa	A Koopa Troopa with wings. Green ones jump towards the player or fly back and forth, while red ones fly up and down.
Koopa Troopa	A soldier of the Turtle Empire that marches onwards. If stomped, it retreats in its shell, which can be kicked to hit other enemies and gain points. Green ones walk back and forth just like Little Goombas, and red ones timidly turn around when they find a pit.
Little Goomba	A mushroom traitor that walks back and forth. They are the weakest and most common enemies throughout the game and can be stomped or hit with fireballs or a Starman. They are replaced with Buzzy Beetles in Hard Mode.
Piranha Plant	A carnivorous plant that lives in a pipe. It rises up, trying to hit Mario, and retreats. If Mario is near, it will not rise up.
Podoboo	A fireball guardian of the Koopa King's lair. It jumps from the lava, trying to hit Mario.
Cheep-cheep	A red, green, or gray fish normally found swimming in water. In certain levels, starting with World 2-3, they will leap from the water, trying to hit Mario or Luigi.
Fire-Bar	Various fireballs stacked together moving either clockwise or counterclockwise. Their length may vary.
Bloober	A squid-like sentry that persistently pursues the player.

(and don't forget—at the end of level 2-4…)
Fake Bowser
https://www.mariowiki.com/Super_Mario_Bros.#Fake_Bowser

CPSC 386 Project Four: Super Mario Brothers – World Levels 1 and 2

due 30 Oct (-01), 1 Nov (-02) at beginning of class

Your name:

Repository: https://github.com/_____/

Finished	Not Finished	**Verify each of the following items and place a checkmark in the correct column. Each item incorrectly marked will incur a 5% penalty on the assignment's grade.**
❑	❑	Overall, game has look and feel of original Super Mario 1985 game (see UTA website).
❑	❑	There are 2 world levels, each with 4 sub-levels. The world levels and sub-levels match those shown on the UTA website, and are described in the beginning of this project.
❑	❑	Levels pan sideways as Mario moves through them, revealing portions of the level to pass through, and enemies and obstacles to overcome.
❑	❑	Mario is implemented so he can walk, run, jump, crouch, slide, or through fire-balls as he moves through sub-levels.
❑	❑	Mario moves to next sub-level when he makes it alive through a sub-level in the time allocated.
❑	❑	Mario moves to the next world level if he makes it alive through all four sub-levels.
❑	❑	Mario can jump, and can jump higher if he jumps while still in the air.
❑	❑	Super Mario can break bricks with his head (or force coins and mushrooms out).
❑	❑	Fire Mario can throw fireballs at enemies to destroy them. (Super Mario becomes Fire Mario if he touches a fire flower).
❑	❑	Mario becomes Super Mario if he touches a power-up mushroom.
❑	❑	Super Mario becomes Invincible Mario if he touches a Power star. When invincible, he can run through any enemy without damage. He can only do this for a limited time.
❑	❑	Mario can collect coins as he moves, and can gain lives if he collects enough.
❑	❑	Enemies and obstacles oppose Mario as he moves (Koopas, Goombas, Cheep-cheeps, fire-balls, firebars, bloobers, and man-eating plants).
❑	❑	If Mario touches an enemy when he is Super Mario, he will transform back to Mario. If he touches one when he is Mario, he will lose a life.
❑	❑	Mario is animated as he moves, and is animated when he transforms.
❑	❑	Enemies have a simple animation (usually 2-4 frames). Mario has a more complex, 6-8 frame animation.
❑	❑	Mario, his alter-egos, the level items, and his enemies are all created using a pixel editor (such as Gimp or Inkscape), or are downloaded from a Sprite sheet. If downloaded, appropriate credit must be given.
❑	❑	The Python code is object-oriented, and shows good overall game design. No issues are shown in any file in PyCharm (all source files pass PEP 8).
❑	❑	Project directory has been pushed using a GitHub client, not by manually dragging-and-dropping files onto the GitHub web page.

Comments: