

Project: Centipede

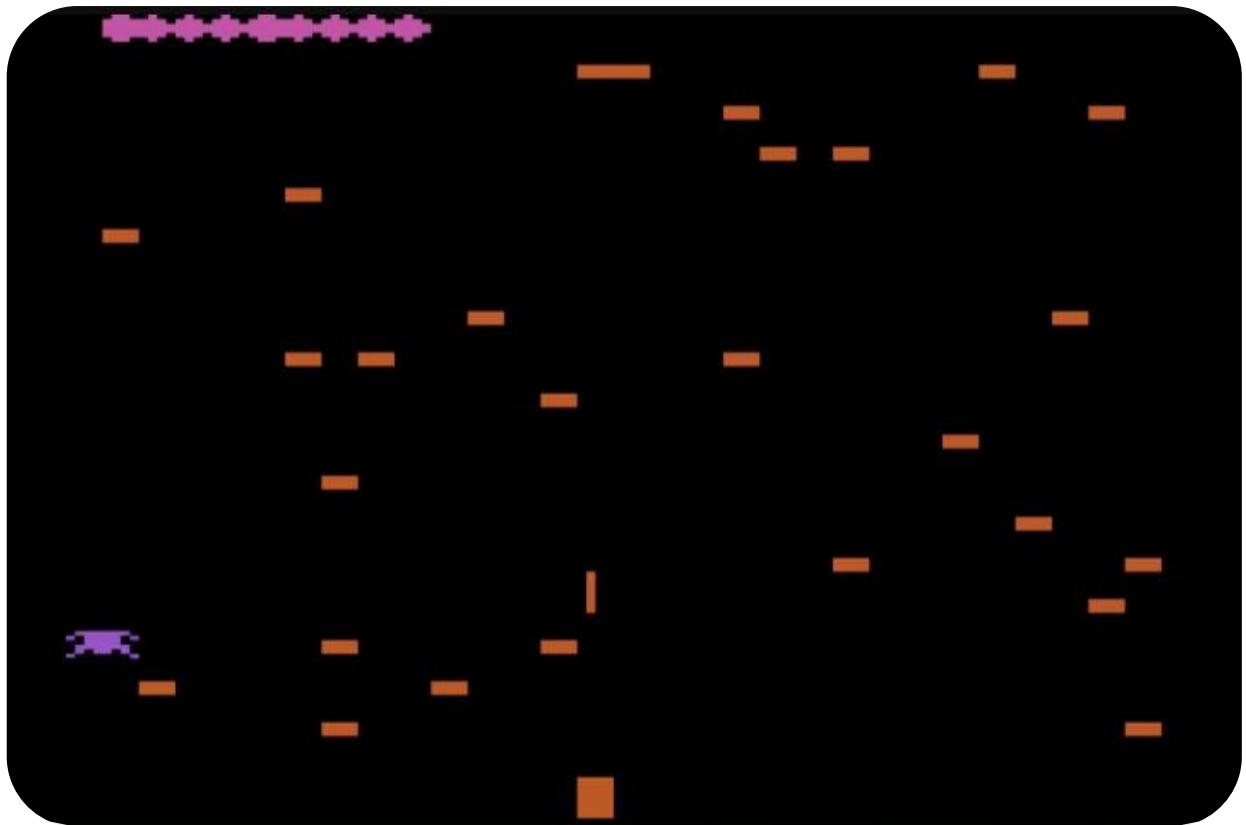


Figure 1: Sample Screenshot

Description

Centipede is a vertically oriented fixed shooter arcade game produced by Atari, Inc. in June 1981. The game was designed by Dona Bailey and Ed Logg. It was one of the most commercially successful games from the video arcade's golden age and was very popular among the member of previous generation. The player fights off centipedes, spiders, scorpions, and ants, completing a round after eliminating the centipede that winds down the playing field. Click [here](#) to view the demo of the game.

You will be implementing a simpler version of the game. The details of features to be implemented are mentioned below in this file. You are also provided with the skeleton code that will provide partial environment of the game. Understanding the skeleton code is also part of the project as you are expected to convert into running project after joining a professional organization.

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Gameplay:

Fighter Vs. Centipede

1. The entire field(Screen) is divided into rows and columns in a form of a multi-dimensional array.
2. The player's fighter is represented by a rectangle at the bottom of the screen.
3. The enemy is represented by a centipede consisting of 12 segments at the first level..
4. The player can move only in payer area. This area is five rows high and spans the entire width of the field. Upon moving upwards or sideways, the player can step a row or a column at a time using keyboard arrow keys.
5. The player moves the fighter around the bottom area of the screen and fires laser shots at a centipede advancing from the top of the screen down through a field of mushrooms. The traveling of laser will be represented by white pixels.
6. Whenever the laser hits a centipede segment, it splits the into two pieces at that point. Each piece then continues independently on its way down the screen, with the rear piece growing its own head. If the head is destroyed, in the earlier levels then the whole segment will be destroyed but in advanced levels if the head is destroyed then the segment behind it becomes the next head.
7. The centipede starts at the random location of the screen and traveling to the left side.
8. The head of centipede can be of different colors in different levels. (See point 6.)
9. When the centipede eats a mushroom or reaches the edge of the screen, it descends one level and reverses direction. Thus, more mushrooms on the screen cause the centipede to descend more rapidly.
10. The player can destroy mushrooms by shooting them, but each takes two shots to destroy. The game starts with a random number of mushrooms between 20 and 30 and displayed at random locations.
11. If there is only head remaining in the centipede segment and it is hit by laser then it is killed
12. Once the centipede reaches the bottom of the screen, it moves back and forth within the player area and one-segment "head" centipedes will periodically appear from the side. This continues until the player has eliminated both the original centipede and all heads.
13. In the player area if fighter hit the centipede with the laser, it will create a poisonous mushroom. If the fighter touches poisonous mushroom then it will kills the fighter.
14. The fighter will be destroyed when hit by any segment of centipede.
15. The speed of centipede will be double in each advance level.

Scoring

- Mushrooms: 1 (destroyed)
 - Centipede: 10 (body) or 20 points (head).
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Bonus

Note: All the above features must be implemented and the Following features are not mandatory however will be considered for bonus scores.

Each feature will add 1 bonus mark in your total score.

Levels:

1. If a centipede fragment is able to eat 5 mushrooms without being hit by the laser, its size doubles.
2. When all the centipede's segments are destroyed, a new level starts where new centipede forms at the top of the screen and several mushrooms are added. Every time a centipede is eliminated, the next one is one segment shorter and is accompanied by one additional, fast-moving "head" centipede.
3. Each level has 20% more mushrooms than its previous level. With higher levels have the upper half of the screen covered entirely in mushrooms, causing the centipede to instantly descend toward the player area.
4. The first-level centipede (a complete centipede) has 12 segments, and each next level detaches one segment from the main centipede to make it a separate fast-moving "head" centipede, i.e. each next level has one complete centipede and some head centipedes.

Other Creatures:

1. The player also encounters other creatures besides the centipedes.
2. *Fleas* are less likely to appear on higher levels when there are more mushrooms available on the screen. *Fleas* drop vertically and disappear upon touching the bottom of the screen, occasionally leaving a trail of mushrooms in their path; they appear when only three mushrooms are in the player movement area
3. *Spiders* move across the player area in a zig-zag pattern and eat some of the mushrooms.
4. *Scorpions* move horizontally across the screen, turning every mushroom they touch into poisonous (white) mushrooms.
5. Whenever fighter will be destroyed, any poisonous or partially destroyed mushrooms revert to normal. Points are awarded for each regenerated mushroom.
6. The speed is 4 steps per second for the scorpion. The spider moves randomly in the bottom area of 10 rows and 20 columns. It can move upward, downward, or diagonally inside a square area of 10 rows and 10 columns from its current position, where the upward movement is bounded by its own movement area.

Scoring

- **Mushrooms:** 5 points (regenerating upon losing a life).
- **Spiders:** 300, 600, or 900 points, depending on how close the player destroys it. The distance may be three, two, or one step to get 300, 600, or 900 points respectively.
- **Scorpions:** 1,000 points.
- Players earn extra lives per 10,000, 12,000, 15,000, or 20,000 points scored. May have up to 6 lives. The maximum high score is 999,999 points.

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References

Most of the rules are taken from the following online sources:

- Retro Games
https://www.retrogames.cz/play_137Atari2600.php?language=N
- Centipede Game.
https://en.wikipedia.org/wiki/Centipede_%28video_game%29

Enjoy the Coding ☺