

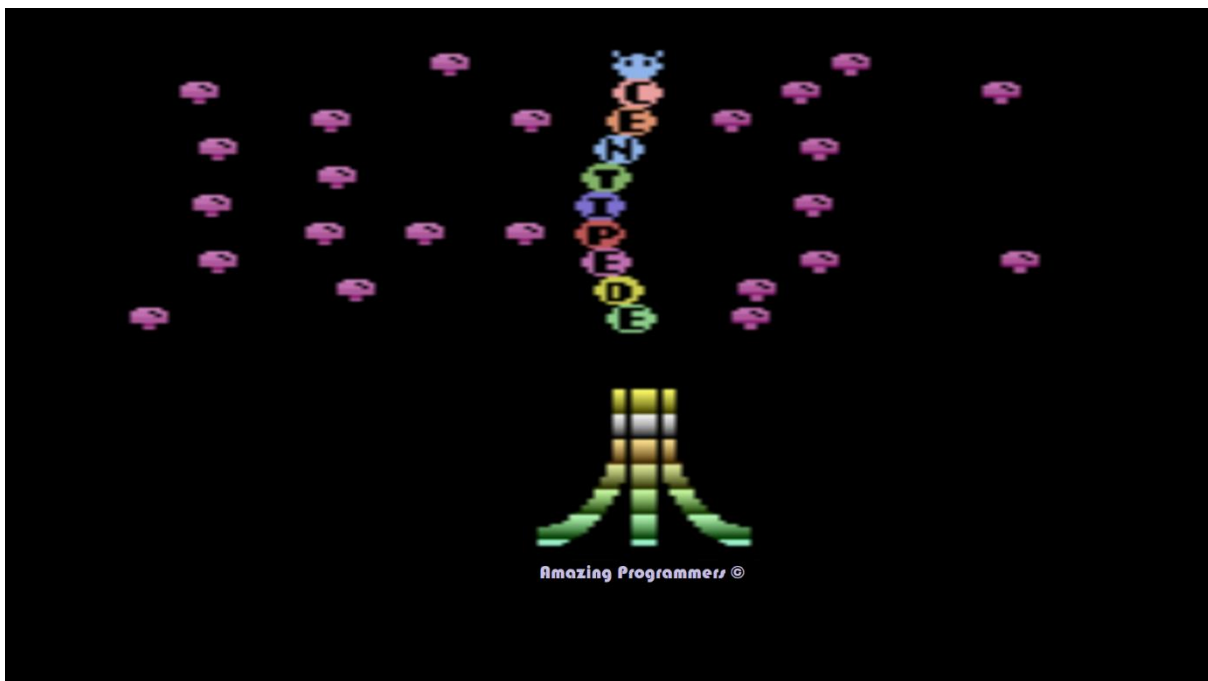
**CS217: Object-Oriented Programming**

**Spring 2019**

**Second Phase**

**Deadline: 6 May 2019 9:00 AM**

# Centipede



## 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. 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.

## Gameplay

### Fighter Vs. Centipede

- The entire field is divided into rows and columns.
- The player's fighter is represented by a small, "somewhat humanoid head" at the bottom of the screen, (though described as being a garden gnome).
- The player 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.
- The player moves the fighter around the bottom area of the screen and fires laser shots at a segmented centipede advancing from the top of the screen down through a field of mushrooms.
- Shooting any segment of the centipede creates a mushroom; shooting one of the middle segments splits the centipede 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, the segment behind it becomes the next head.
- The centipede starts at the top-right of the screen, traveling left. There are two types of segments of a centipede - called *lazy* and *magic* segments. The magic segments of the centipede blink at random intervals and while blinking a segment cannot be destroyed.
- The head of centipede is always a magic segment while the body is composed of lazy segments.
- The minimum and maximum interval between two blinks are three and nine seconds respectively.
- When the centipede touches 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.
- 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.
- 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.
- The fighter will be destroyed when hit by an enemy
- The player also encounters other creatures besides the centipedes. *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.
- The speed of a creature is measured in steps per second, where a step is considered as a row or a column at a time. The speed is 2 and 6 steps a second for the centipede and flea respectively

## Scoring

- Mushrooms: 1 (destroyed)
- Centipede: 10 (body) or 100 points (head).
- Fleas: 200 points.

## Bonus:

### Levels:

- 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.
- Each level has 20% more mushrooms than its previous level.
- The first-level centipede (a complete centipede) has 10 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. Each level has an increasing number of mushrooms, often with higher levels have the upper half of the screen covered entirely in mushrooms, causing the centipede to instantly descend toward the player area.

### Other Creatures:

- The player also encounters other creatures besides the centipedes.
- *Fleas* are less likely to appear on higher levels when there are more mushrooms available on the screen.
- *Spiders* move across the player area in a zig-zag pattern and eat some of the mushrooms.
- *Scorpions* move horizontally across the screen, turning every mushroom they touch into poisonous (white) mushrooms.
- A centipede touching a poisonous mushroom will change color and hurtle straight down toward the player area, then returns to normal behavior upon reaching it.
- Whenever fighter will be destroyed, any poisonous or partially destroyed mushrooms revert to normal. Points are awarded for each regenerated mushroom.
- 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.

## References

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

[https://www.retrogames.cz/play\\_137-Atari2600.php?language=EN](https://www.retrogames.cz/play_137-Atari2600.php?language=EN)

[https://en.wikipedia.org/wiki/Centipede\\_%28video\\_game%29](https://en.wikipedia.org/wiki/Centipede_%28video_game%29)