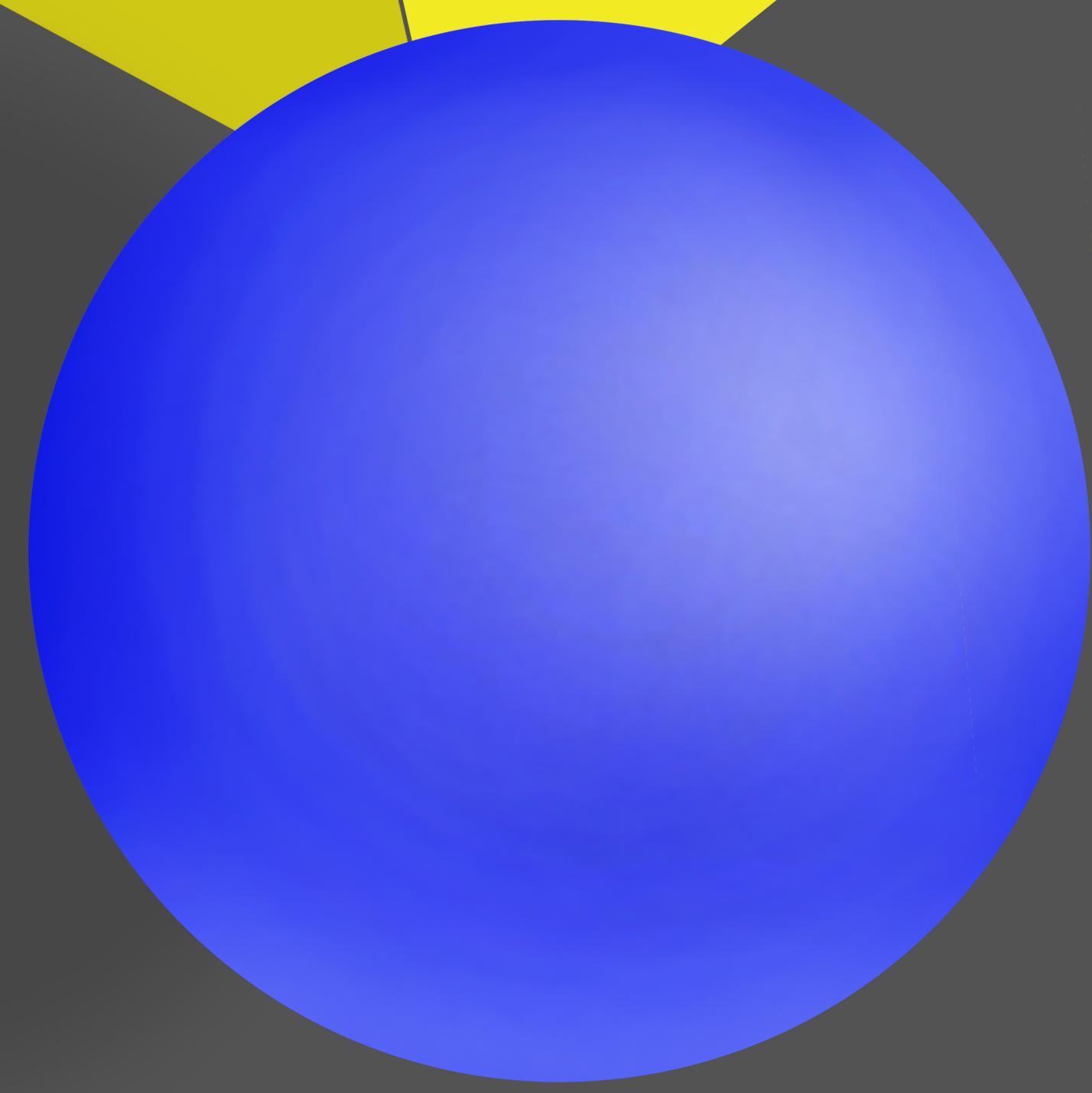


SPHERO MAZE



What is Sphero Maze?

Sphero maze is a real-time, interactive demonstration to show how we can use computers, cameras, and wireless devices to solve real-world problems and finish complex tasks.

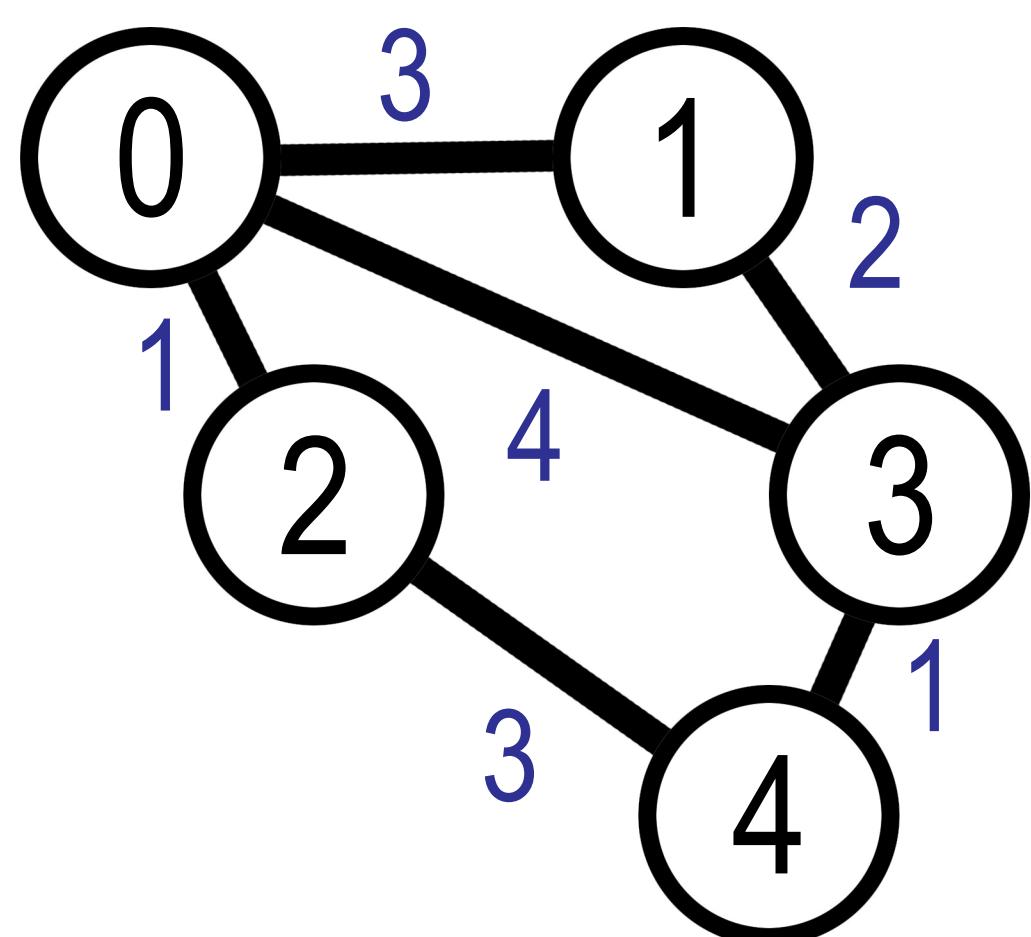
How Does it Work?

The maze uses a Python script to run color detection and identify the different parts of the maze. A process called Dijkstra's Algorithm is then run to identify a path for the ball to follow and solve the maze.

How do I use it?

Place the blue ball in the maze. The ball will navigate around the yellow walls to reach the square, red endpoint. The walls and endpoint can be moved to create a different maze every time.

So What Exactly is Dijkstra's Algorithm?



Possible paths:

$$0 \rightarrow 1 \rightarrow 3 \rightarrow 4 \\ 3 + 2 + 1 = 6$$

$$0 \rightarrow 3 \rightarrow 4 \\ 4 + 1 = 5$$

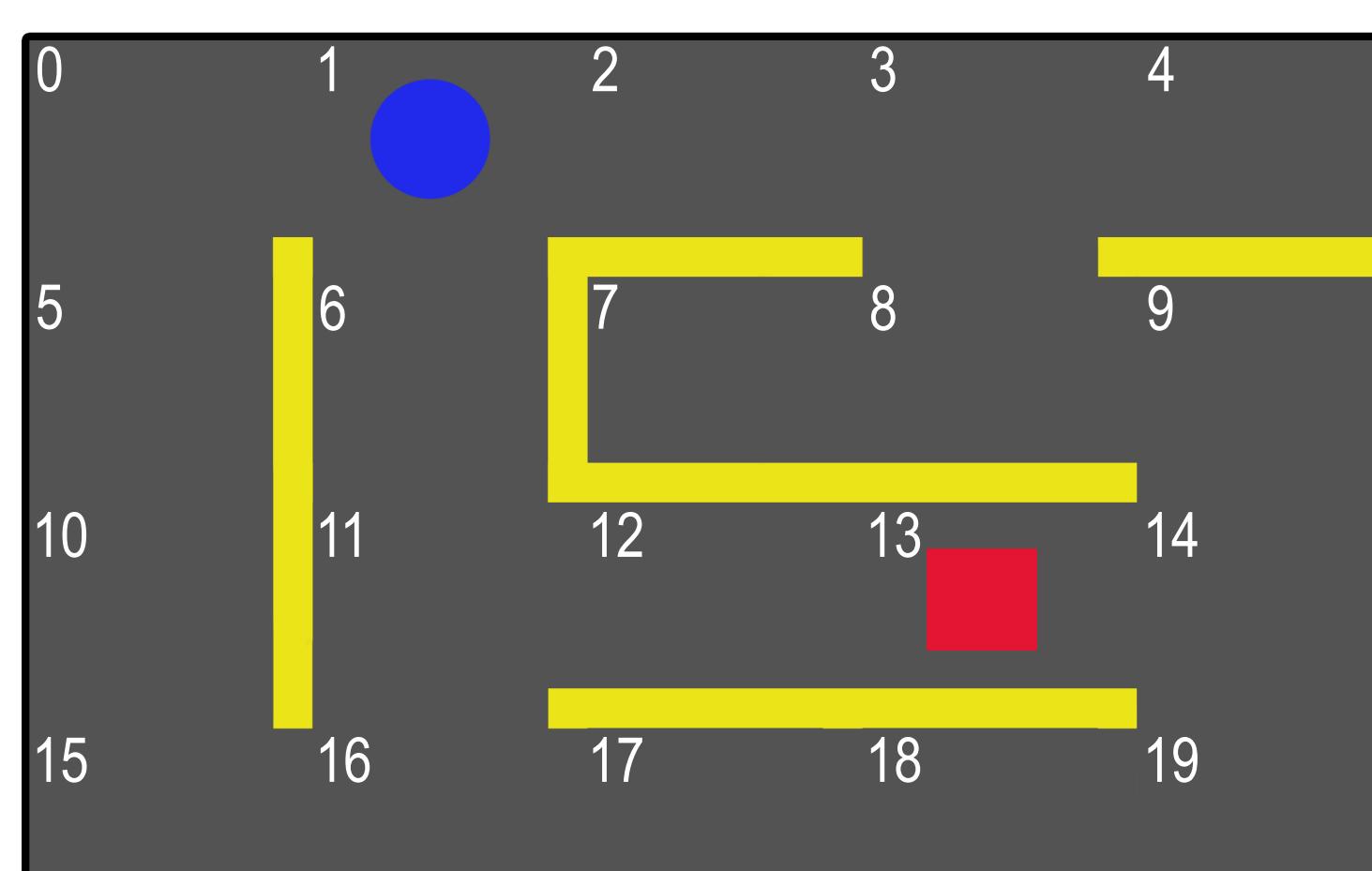
$$0 \rightarrow 2 \rightarrow 4 \\ 1 + 3 = 4$$

Dijkstra's algorithm is a method of finding the shortest path between two points.

In the example shown here. The black circles represent different locations. The smaller, blue numbers represent distances. The shortest path from point 0 to point 4 is through point 2, with a total distance of just 4.

How Does That Help Solve the Maze?

The camera allows the computer to see the maze from above. From an aerial perspective, the maze can be divided into a grid, with each square a labeled point.



From there, just like in the example on the left, Dijkstra's algorithm can be used to find the shortest path to the finish.

The shortest path for this maze is 1→6→11→12→13. That might seem easy for you to figure out, but by teaching a computer to do it, we can solve any maze without having to do anything ourselves!