

Go, Sphero, Go!

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Please Help Professor Brown

- This class is new to Professor Brown.
- He needs to know how he's doing.
- Please answer a 10-question survey.
- This is ***not for a grade.***
- Put your computer number, not your name on it.
- Put your grade on it.
- If you're not sure, pick the answer that seems best.

The Plan !

In the next few weeks we will

- Work together on Sphero projects at first.
- Work in teams on independent projects.
- Learn as we go along!

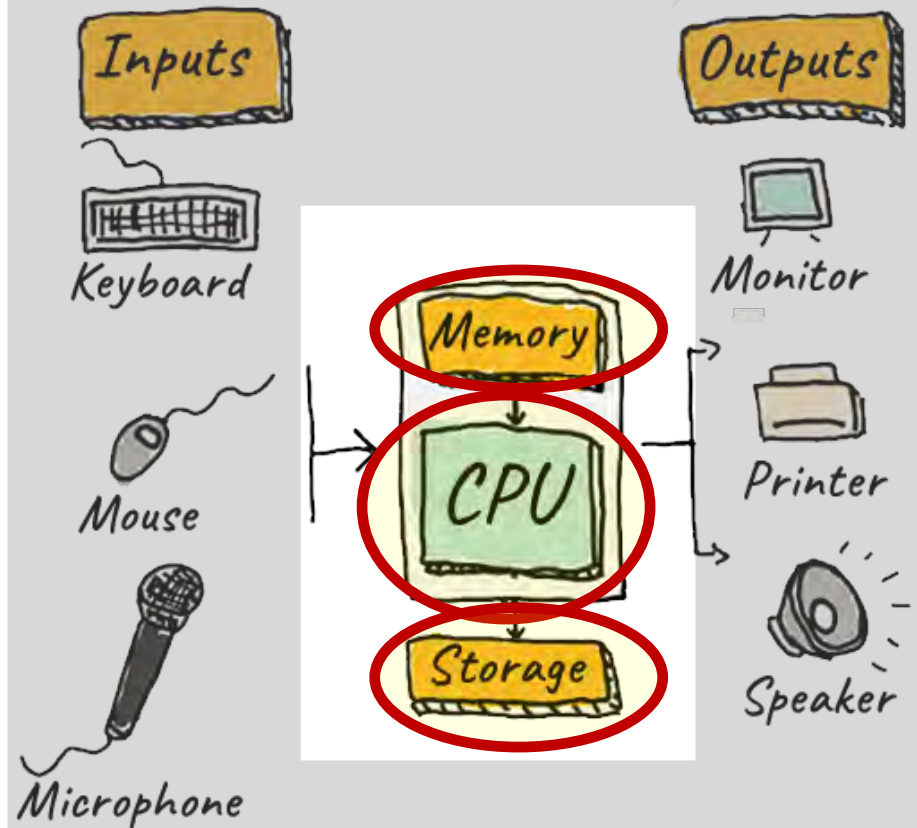


What is a Computer?

- A computer is a machine.
- It takes simple actions in response to commands.
- The commands can be stored, to be used over and over.
- The stored commands are called a *program*.
- Programs are written in computer code.

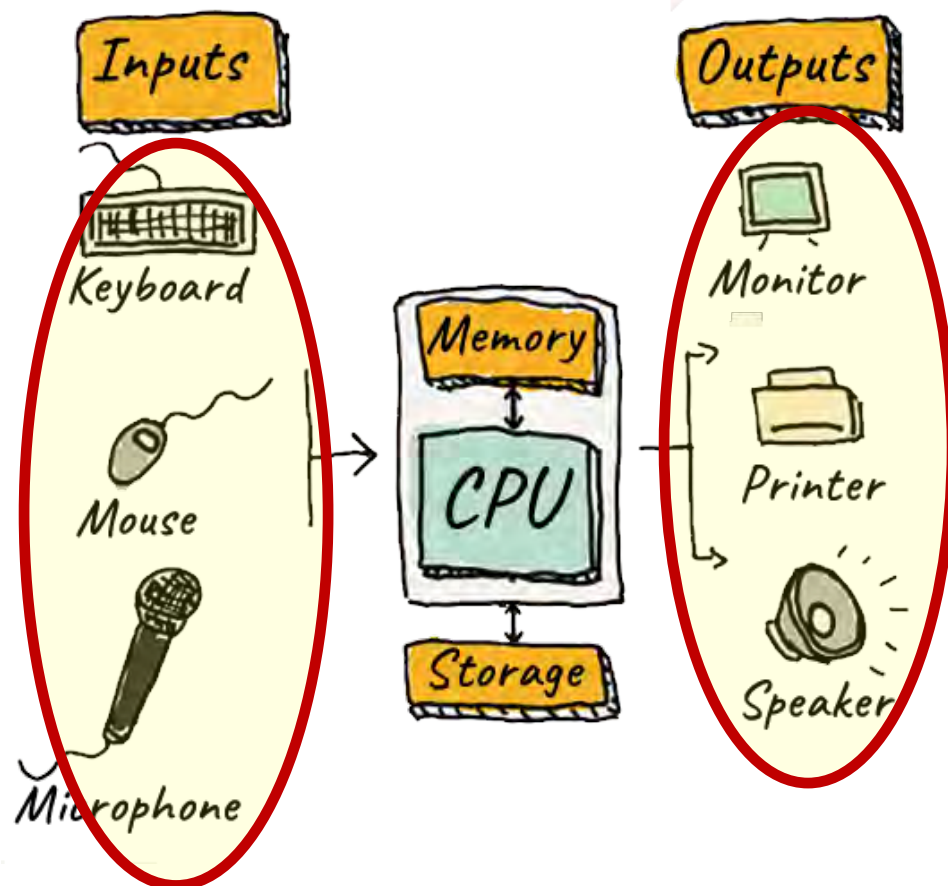
The CPU and Memory

- The **CPU** executes commands, one at a time.
- The **memory** holds the program and its data. Called **RAM**.
- **Storage** holds programs and data. **Hard disk, SSD, or flash** memory.



Input and Output

- **Inputs** are processed by the CPU as commanded by the program.
- **Outputs** are produced by the CPU as commanded by the program.
- There are different kinds of **devices** for input and output.



Another Way to Think

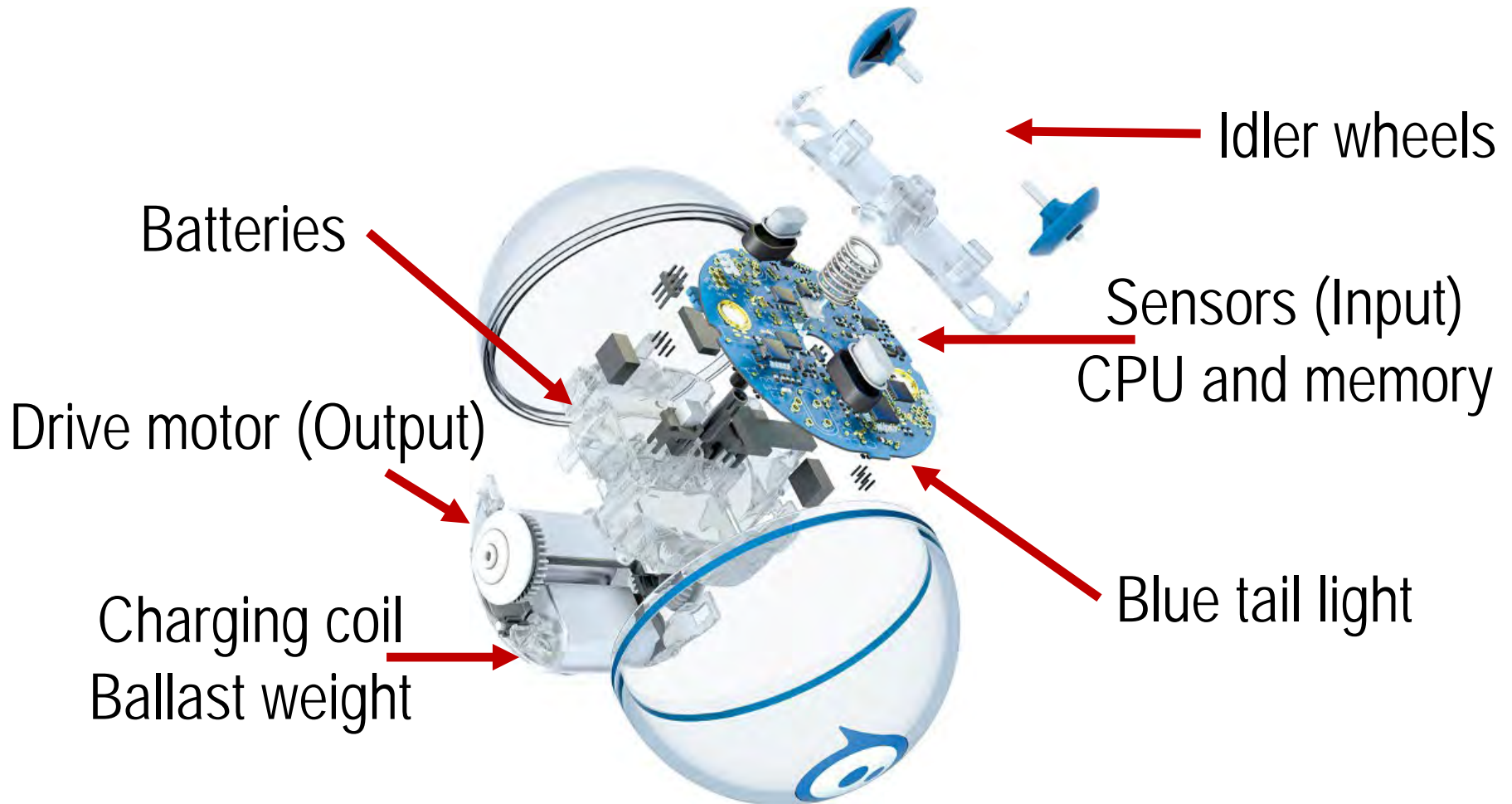
- Computers receive ***inputs***.
- Inputs are ***processed*** by a ***program***.
- Which produces the ***outputs***.



Exploring the Sphero



Exploring the Sphero



Exploring the Sphero



Charging base

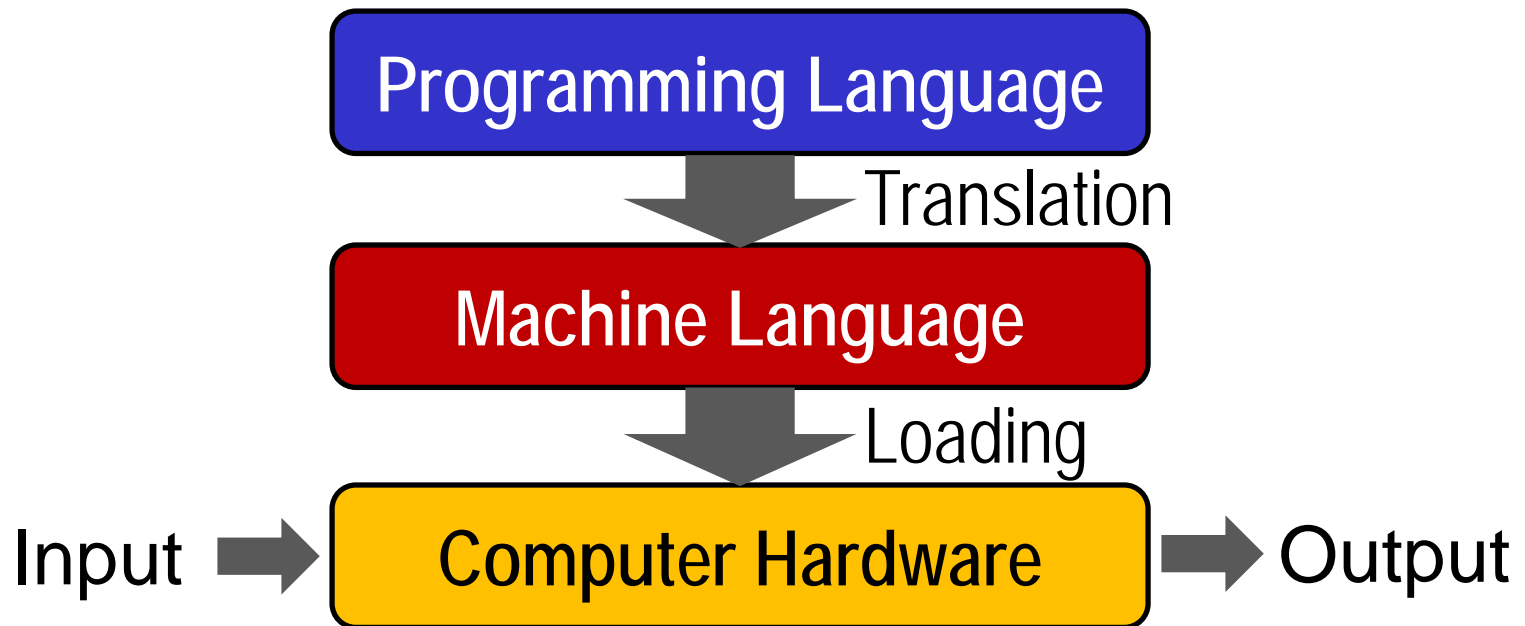


Computers, Humans, and Languages

- Humans speak English (Or Spanish, or French, or Japanese...)
- Computers understand only strings of ones and zeros, called ***machine language***.
- Humans write for computers in highly-structured languages called ***programming languages***.

Translation to Machine Language

Programming languages must be ***translated*** to ones and zeros for the computer.



Connect to Your Sphero

- The Sphero app uses Bluetooth to communicate.
- Open the Sphero app.
- Log in
 - Your user ID is your student number:
s12345678
 - Your password is also your student number

Connect to Your Sphero

- Click the “Connect” button.
- The robot number to connect is on the pink sticky note on your desk.

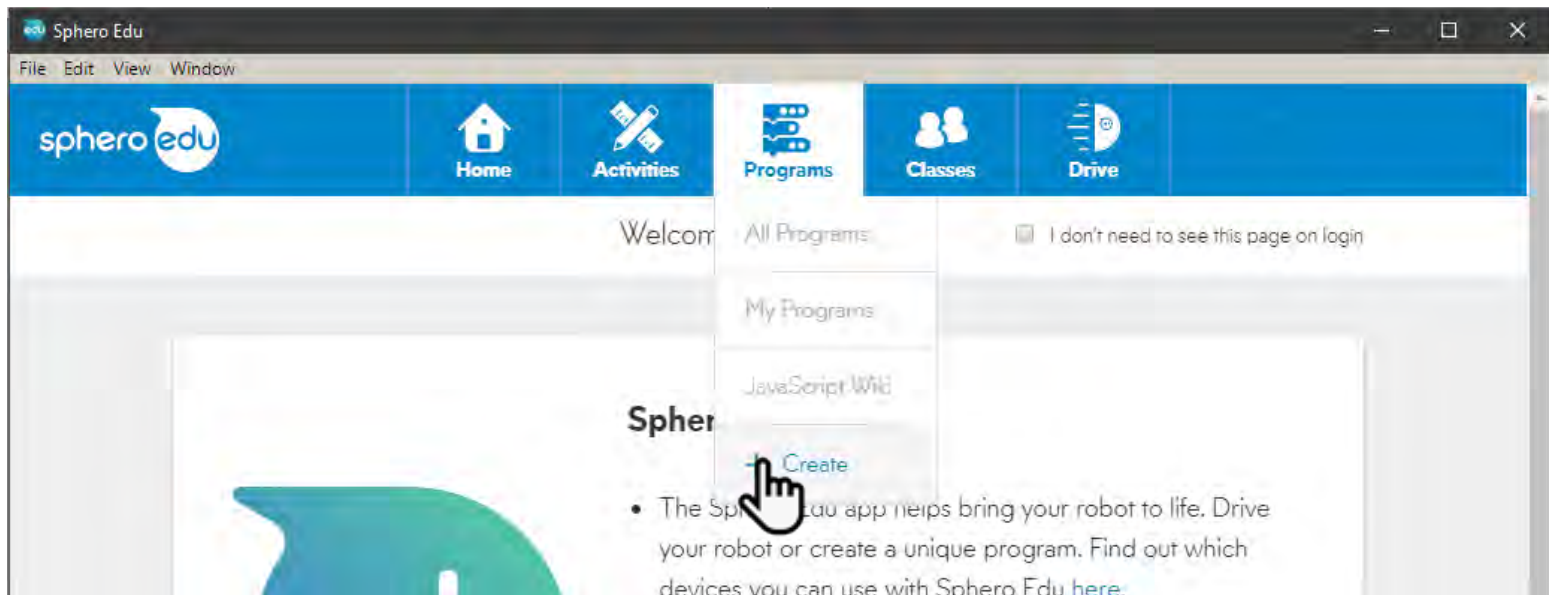
How Fast is Sphero ?

Algorithm:

- When “Start” is clicked:
 - Make Sphero roll
 - Duration 3 seconds
 - Speed 20
 - Heading 0
- Stop

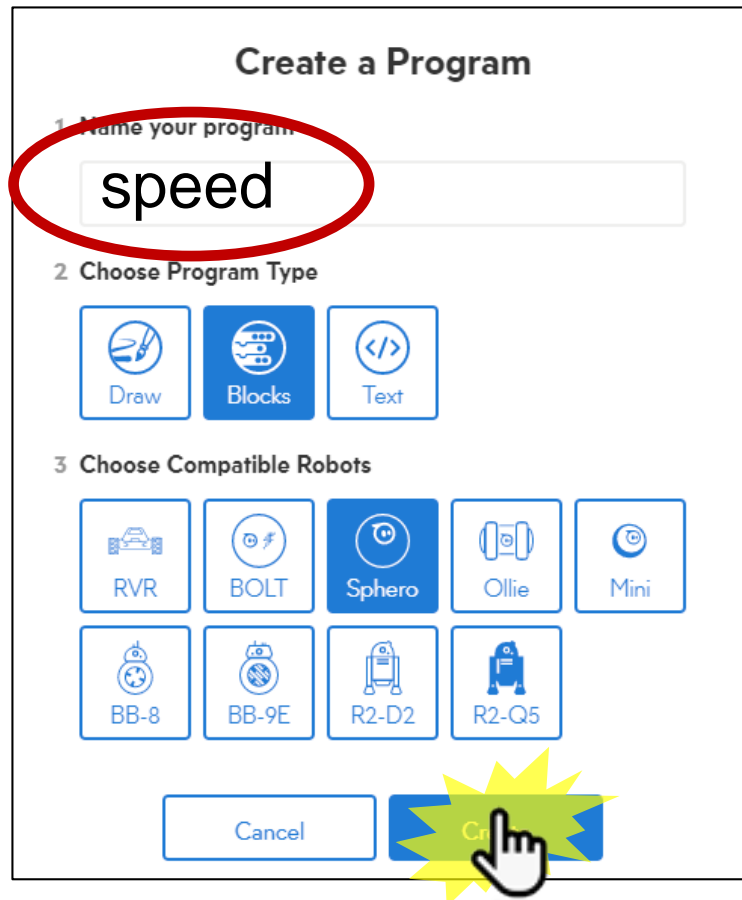
Create a Sphero Program

In the Sphero app, click “Programs” and “Create.”



Create a Sphero Program

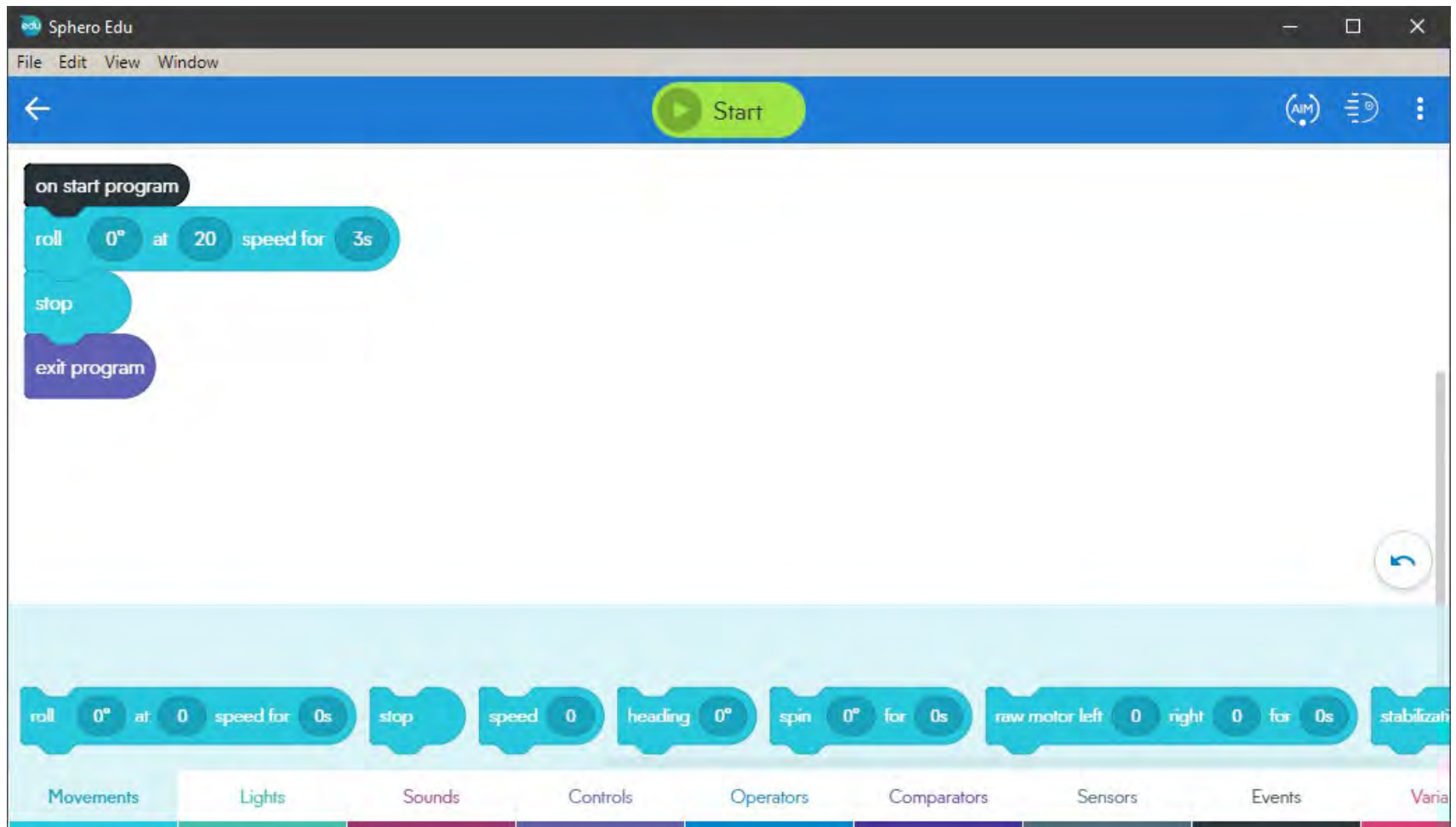
Name your program “speed” and click “Create.”



The screenshot shows the 'Create a Program' interface. Step 1, 'Name your program', has a text input field containing 'speed', which is circled in red. Step 2, 'Choose Program Type', shows three options: 'Draw', 'Blocks', and 'Text'. Step 3, 'Choose Compatible Robots', shows a grid of robot icons: RVR, BOLT, Sphero (highlighted in blue), Ollie, Mini, BB-8, BB-9E, R2-D2, and R2-Q5. At the bottom, there are 'Cancel' and 'Create' buttons. A hand cursor is clicking the 'Create' button, which is highlighted with a yellow starburst.



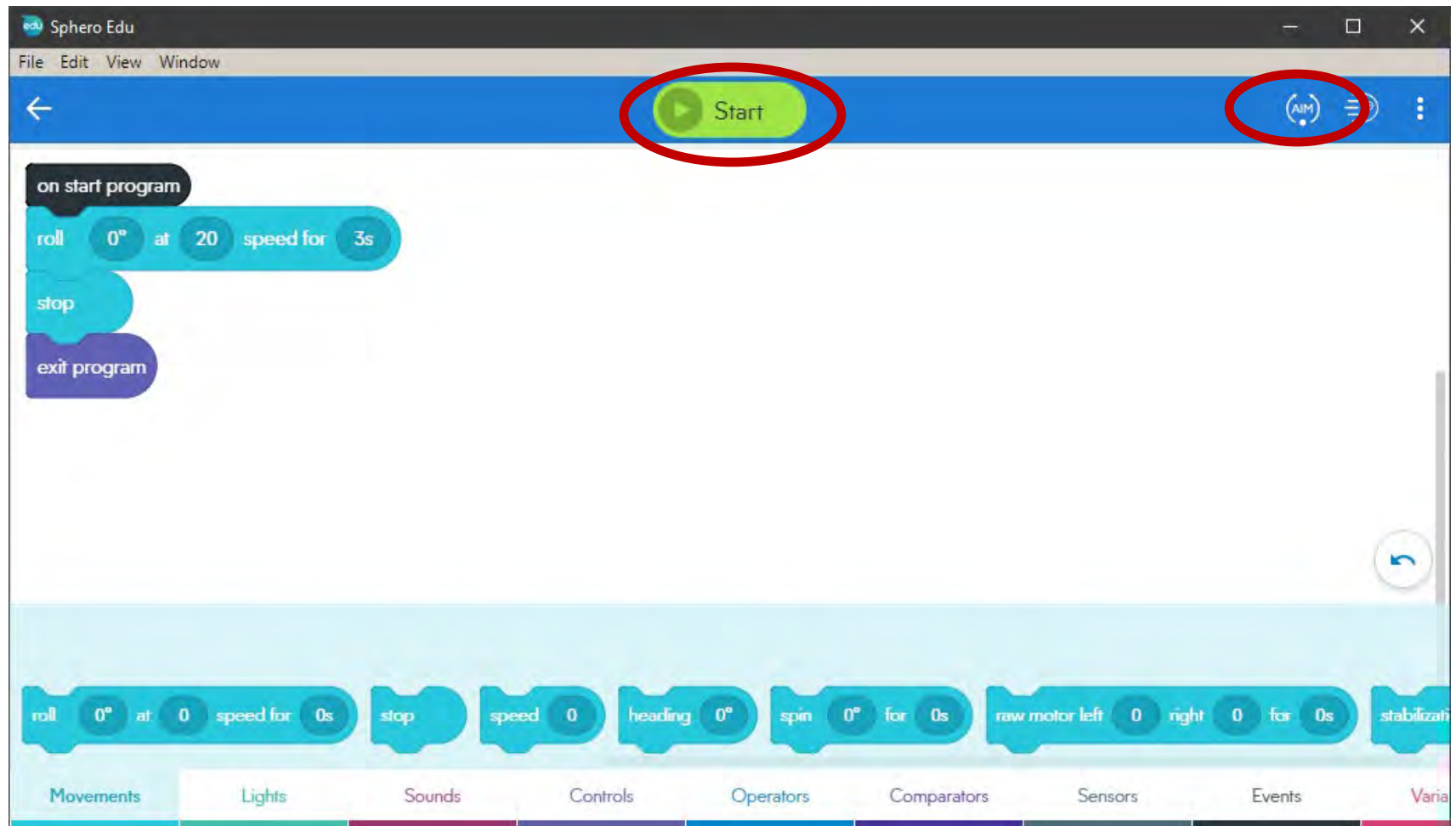
Your Program !



Run Your Program

- Put a tiny bit of masking tape on the floor.
- Place your Sphero on the masking tape.
- Aim Sphero so that the tail light faces you.
- Start your program. Measure how far Sphero traveled.

Run Your Program



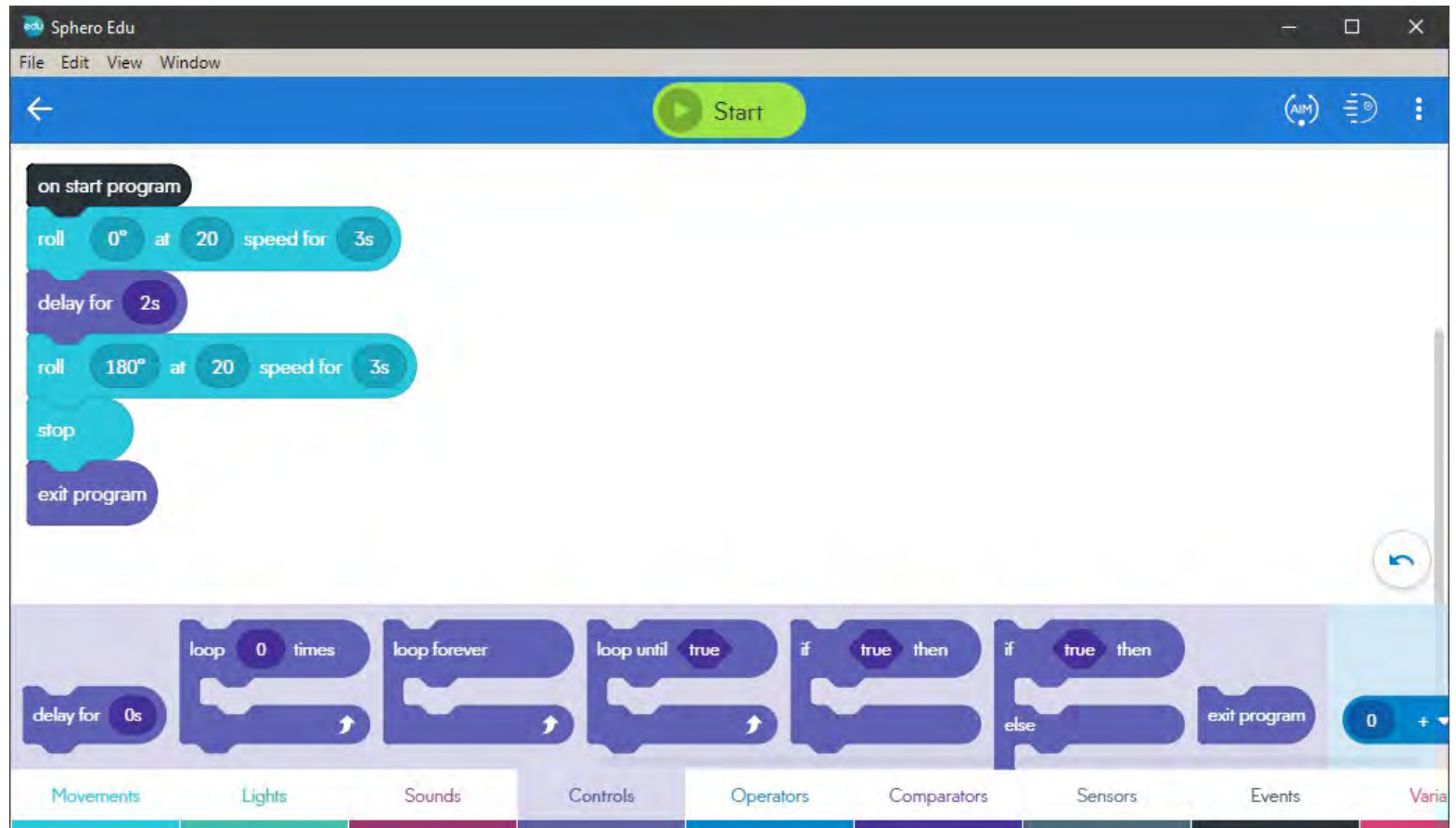
Thought Challenges

- Measure the distance your Sphero traveled.
- Compute the speed in inches per second.
- What would happen if you changed the speed?
- What would happen if you changed the direction?
- Try it!

Programming Challenge

- Can you make your Sphero go out and come back?
- Hints:
 - The opposite of 0 degrees is 180 degrees.
 - You need a short delay after the “Stop” when your Sphero is heading away, then use another “roll” command to make it come back.
- Test it!

Making Your Sphero Come Back



Explore a Little More

- Your program is ready, but let's explore!
- Right click on one of the blocks in the program area. What happens?
- Right click on one of the blocks in the band at the bottom. What happens?
- Click the different colored words along the bottom of the screen.
- Left-click one of the blocks in the band at the bottom and slide left or right.



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