Experiment1.3

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Subject Name: IoT Lab   **Subject Code: 20CSP_358**

1. Aim:

Demonstration of Autodesk TinkerCad Simulation Platform.

2. Objective:

1. Learn about IoT based simulations.
2. Testing and model in IoT based simulation platform.

3. Script and Output:

TinkerCad is a free, web-based 3D modeling software developed by Autodesk. It is a user-friendly platform that allows individuals, including beginners, to create and design 3D models and objects without needing extensive technical skills. TinkerCad offers a range of tools and features that enable users to easily manipulate shapes, add colours and textures, and export their designs for 3D printing or other uses. It is widely used in educational settings, such as classrooms and maker spaces, to teach students about 3D modeling and digital fabrication.
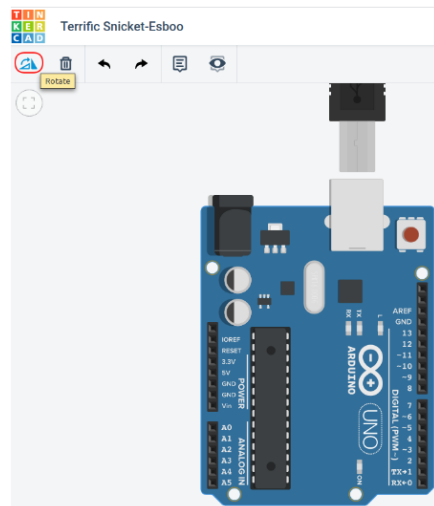
4. Steps:

1. Create a new personal account on TinkerCad website (you can also use your Google account to log in). Then select Circuits on the left pane, and click Create new Circuit.
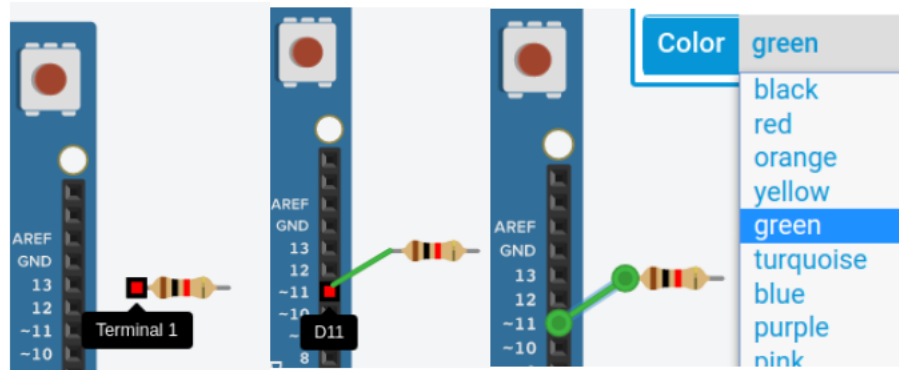
Hardware
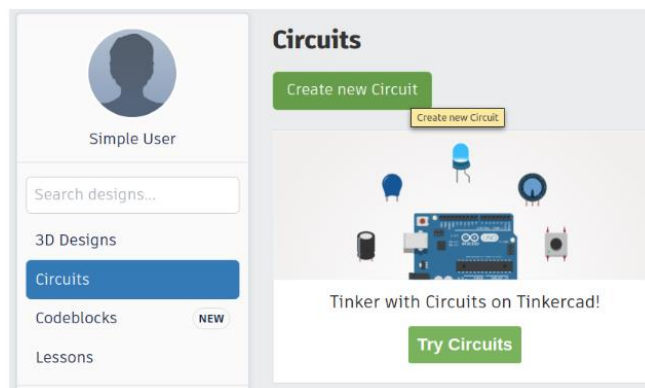
2. In Components Basic, you can select Arduino Uno R3.
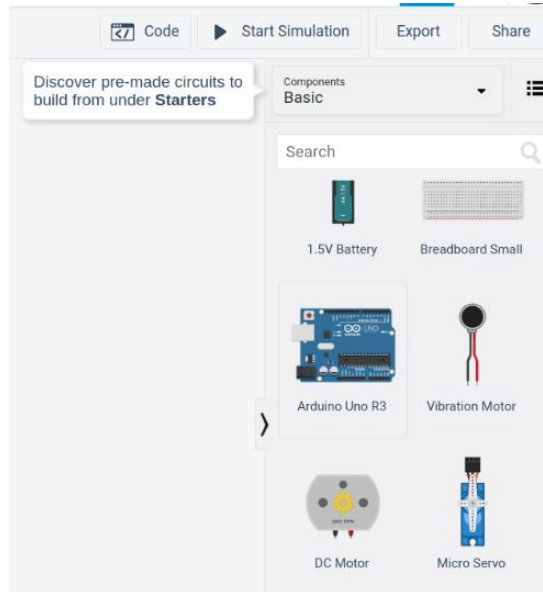
3. You can rotate it to portrait mode if you wish, which will allow more space for other components to be added.

4. You can add more components and wire them up as desired. Clicking on the lead of a component allows you to start a connecting wire from there. Clicking on a wire allows you to change its color.


## Programming and Simulation

To program the Arduino,

1. Click on Code
2. You can choose Blocks or Blocks+Text or Text*. For beginners, it is recommended to use Blocks + Text.
   1. This allows you to see the C++ code generated corresponding to your blocks.
   2. You can copy this code later into Arduino IDE to program the real Arduino, rather than having to write it from scratch.
   3. You can also download the code as an Arduino-compatible .ino file.
3. You can code by selecting the blocks and connecting them appropriately.
4. You can start the simulation by clicking Start Simulation.
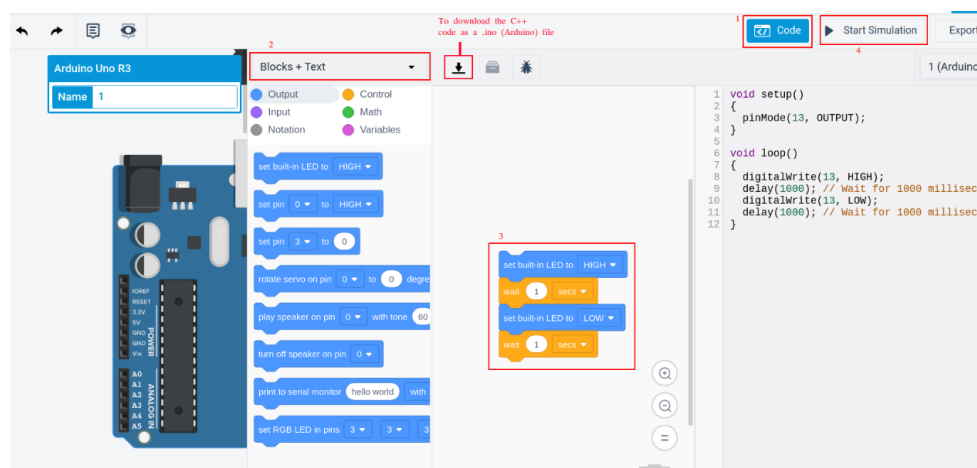
You must click Stop Simulation to stop the simulation before you can modify your program and/or hardware connections.
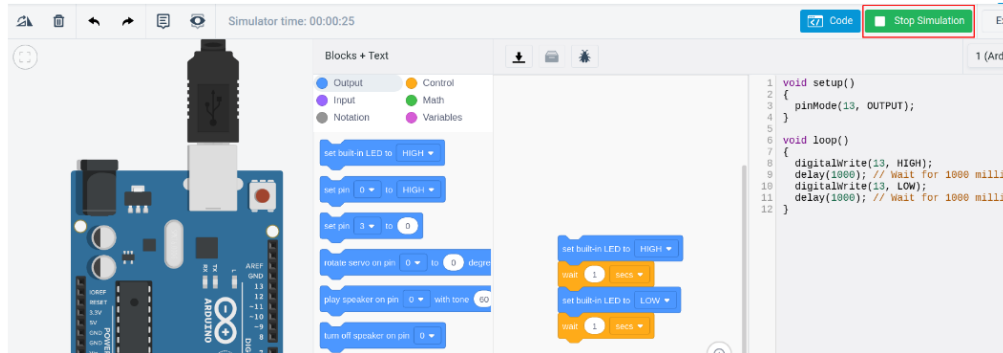
TinkerCad allows for debugging without having to print the values you want to inspect through Serial. The example below shows debugging of the Ultrasonic Distance Sensor example.
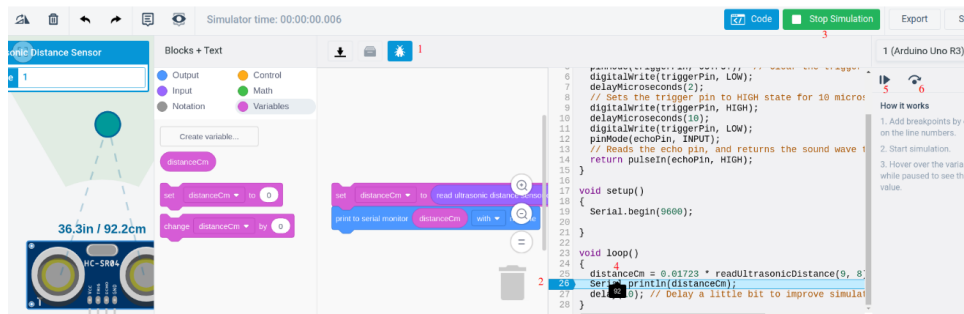
1. Press the Debugger button.
2. Select the line(s) where you want the execution is to be paused. Such a line where you wish to pause execution is called a breakpoint.
3. Click Start Simulation.
4. Hover over the variable values you want to inspect, and determine if the values are along the expected lines. If not, there is something wrong, and use your logic to determine what could be wrong.
5. You can press the Resume execution button to run until the next breakpoint.
6. You can also step line by line by clicking the Step Over Next Function button.