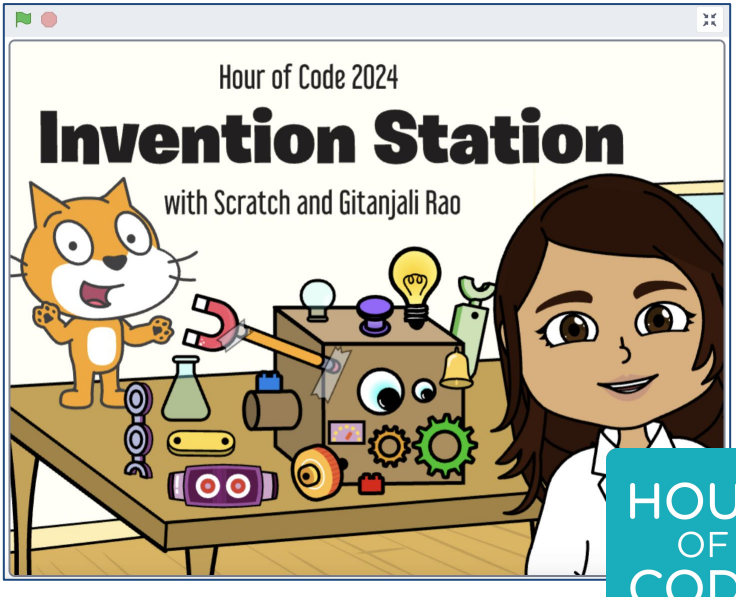
Hour of Code™ 2024 with Scratch



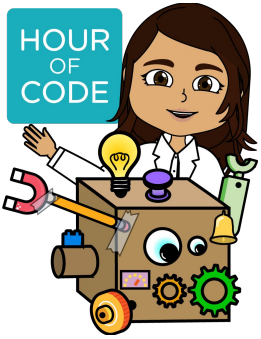
Inventing with Gitanjali Rao

Cards in This Pack

- Meet Gitanjali Rao / Gitanjali's Innovation Process
- Invention Station Project
- Options to Customize Sprites
- Record Your Message
- Make Sprites Draggable
- Conditional Statements
- Create a Sprite to Represent You / Create a Sprite by Remixing
- Using the Paint Editor

The 'Hour of Code™'/'Hora del Código®' is a global initiative by Computer Science Education Week and Code.org to introduce millions of students to one hour of computer science and computer programming.

Meet Gitanjali Rao



For Hour of Code™, Scratch has teamed up with inspiring young scientist and innovator Gitanjali Rao (gitanjalirao.net).

At the Scratch Foundation, we design products and programs that support learners as they develop their thinking, their voice, and their identity. So, the Scratch Team is excited to create and explore with Gitanjali for Hour of Code because she inspires young innovators to try new ideas and develop meaningful solutions in community with others.

When thinking about a new invention, Gitanjali relies on the design thinking, creativity, and curiosity skills, as well as her Innovation Process. Flip this card over for more.

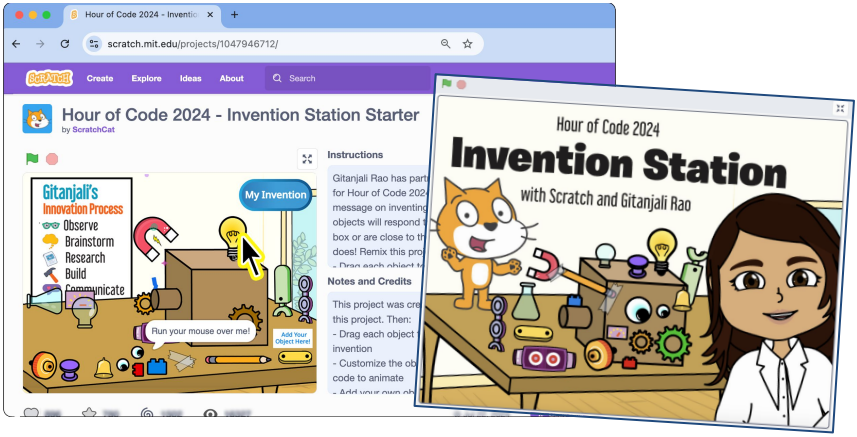
Gitanjali's Innovation Process

- Observe
- Brainstorm
- Research
- Build
- Communicate

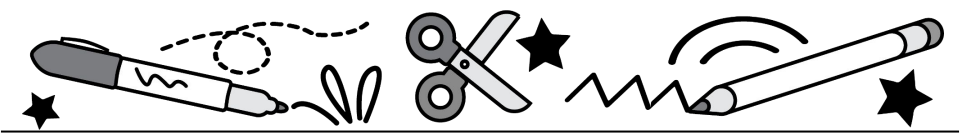
And don't forget to Debug and Iterate!

Learn more about Gitanjali Rao and her inventions on her website at gitanjalirao.net!

Invention Station Project



- As Gitanjali shares in ScratchCat's "Hour of Code 2024 - Invention Station Starter Project" (projects/1047946712), "When I'm inventing, I like to build my idea as soon as possible, so that I'm able to visualize it and I have more motivation to keep going."
- We will build/prototype an invention following her process, and design a solution to a problem that you identify. Let's create something awesome that helps change the world!



Step 1: Click, drag, or hover over objects. Some sprites will respond to your mouse or when touching the box or are close to the box. Experiment to see!

Step 2: Remix the project.

Step 3: Drag each sprite to the box and create your own invention.

Step 4: Customize sprites in the costume editor and/or add your own.

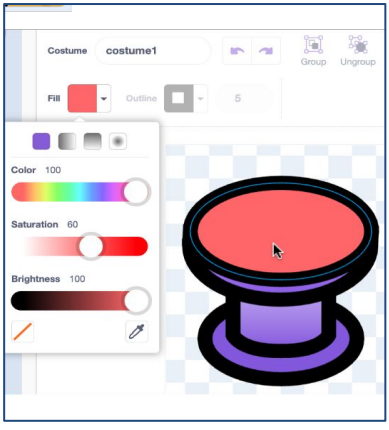
Step 5: Animate! Explore code blocks to rotate sprites, change their size, change their color/brightness/other effect, switch costume, play a sound, etc., when touching the box or when clicked…

Step 6: Share details about your invention! Record and/or write a message to play about what your invention does, and give it a name and description.

Optional: Add a sprite to represent you to the project.

See cards in this set for more information.

Options to Customize Sprites



- Let's explore different ways to rotate sprites, change their size, change their color or brightness, etc.
- We can adjust the look of sprite costumes using the Paint Editor tools.
- Or we can adjust sprites using code blocks.

Options to Customize Sprites

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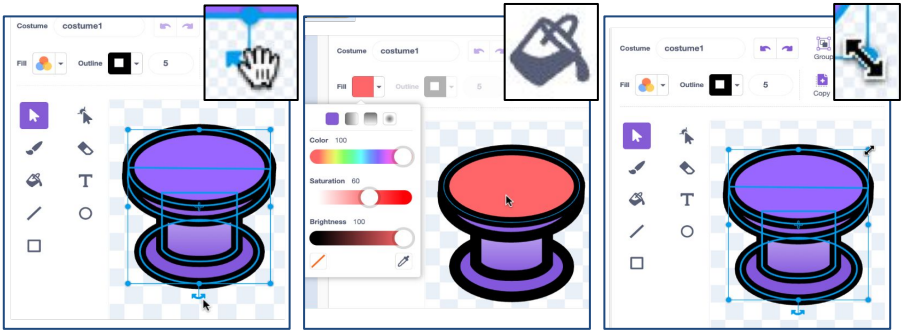
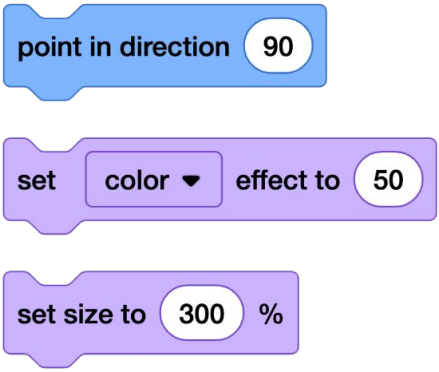
EDIT THE COSTUME IN THE PAINT EDITOR



Rotate with Select Recolor with Fill Resize with Select

ADJUST THE SPRITE WITH CODE



Experiment!

Do you notice any differences between using these code blocks to adjust a sprite versus using the paint editor tools above?

What happens if you use both methods?

Record Your Message

- You can add sounds to project by:
  - Adding a Sound from the Library
  - Uploading a Sound
  - Recording a Sound
  - Using Text to Speech Blocks
- Try sharing details about your invention by recording a message to play about what your invention does using Scratch's record and sound editing functions.
- Add code to the the "My Invention Button" sprite to play your recording.

Record Your Message

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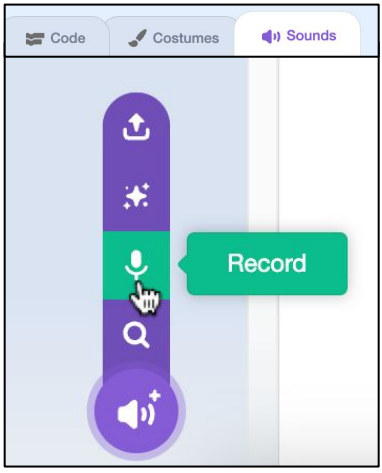
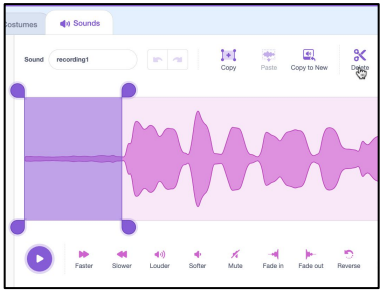
RECORD AND EDIT

1. Select the “Sounds” tab. Hover over the Sounds menu at the bottom of the tab, and select “Record.”



2. See the audio meter on the side registering sounds it is hearing.

3. Press the record button and then stop when done. You check the recording and edit out blank air before and after your recording using the sliders. Save when done.

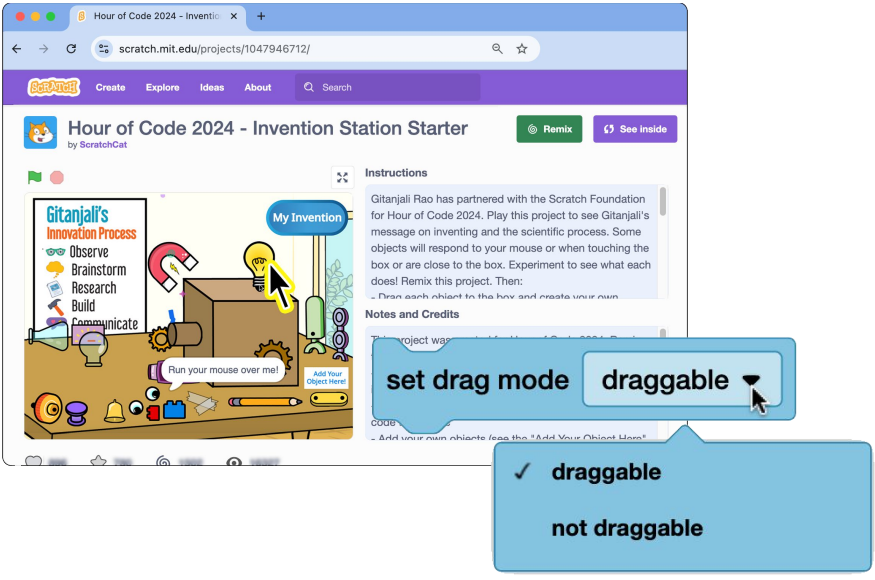


4. Then, use the sound editor tools to make edits, if necessary, like shortening the length or adjusting the volume.

ADD CODE

5. Add code to a sprite to make it play.

Make Sprites Draggable



- By default, sprites can only be dragged/moved around with the mouse when working in the Project Editor, but not when viewed on the Project Page.
- So how do we make objects draggable when on the Project Page? Set the drag mode.

Make Sprites Draggable

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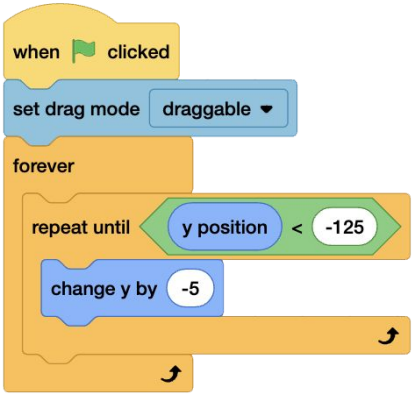
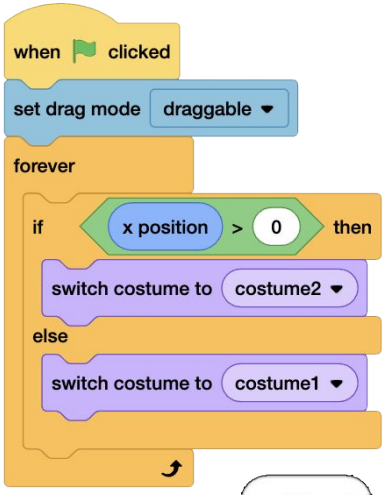
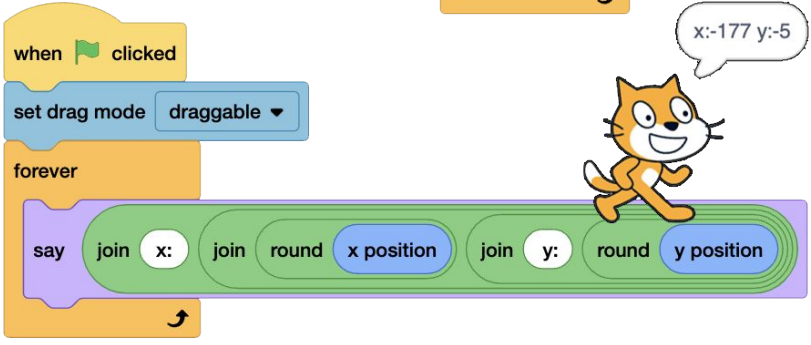
TRY THIS!

Set the drag mode on your sprite as “draggable” or “not draggable.” View the project full screen or view the Project Page. See if you can drag the sprite around with a mouse.

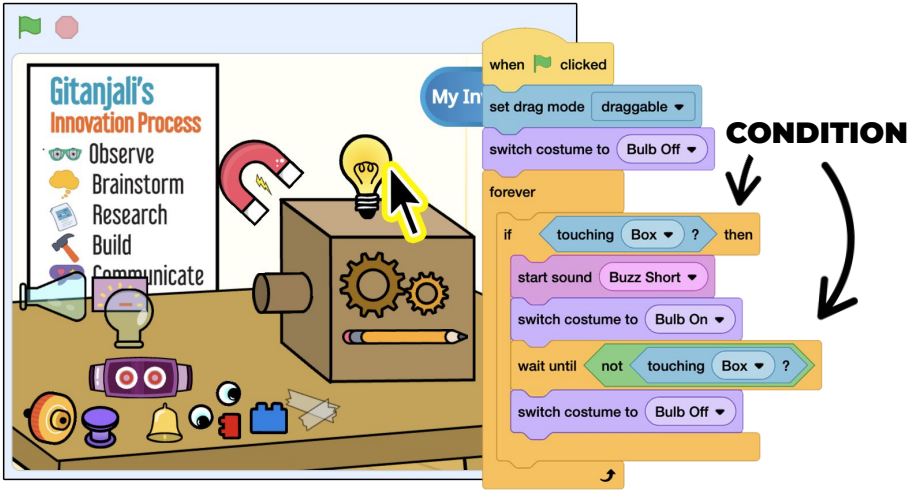
How will you use this? Try these scripts to see what they do.







Conditional Statements



Boolean blocks that report "true" or "false" are used in conditional statement blocks. Try using:

- user actions, such as pressing keyboard keys or mouse positioning or clicking
- sprite interactions (touching another sprite), comparisons (distance between sprites), and touching colors of sprites or backdrops
- data input by users, data stored in variables and lists, or data stored in reporter blocks

Conditional Statements

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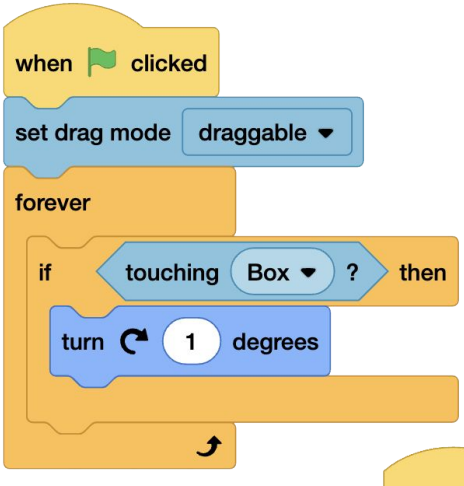
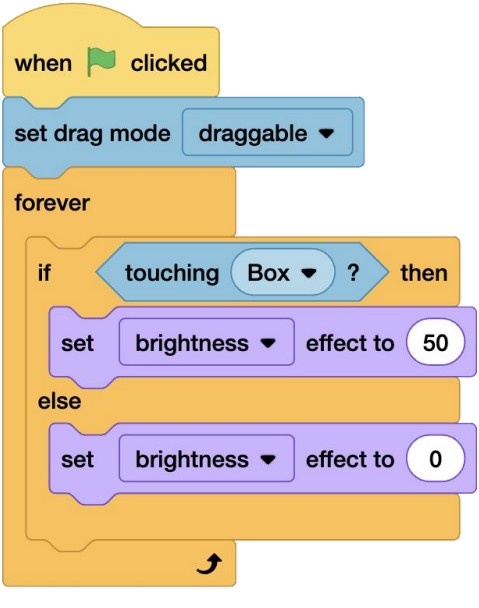
TRY THIS



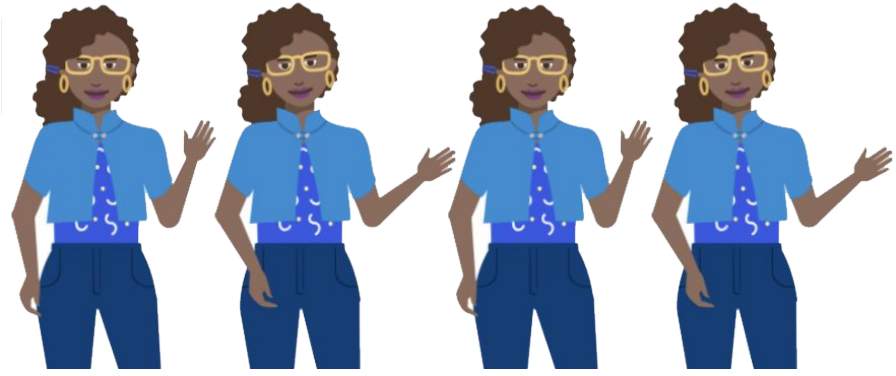
In ScratchCat's "Hour of Code 2024 - Invention Station Starter Project" (projects/1047946712), some sprites are coded using the **"touching box" sensing block** inside an **"if then" or "if then else" conditional statement**.

Create a code stack to make something happen if a sprite is touching the "Box" sprite, if touching the mouse pointer, if a key is pressed…

Sprites could rotate, change their size, change their color/ brightness/other effect, switch costume, play a sound, etc.



Create a Sprite to Represent You



- Perhaps you want to add a character to your project to represent you that can speak about your invention and why you chose to invent it.
- What if you don't have a representation character, or you want to **create or change a character to represent you better**? You could **draw and upload** one, create one using **our Paint Editor tools**, or…
- Let's explore **remixing sprites to create your own**. Flip this card over for more.

Create a Sprite by Remixing

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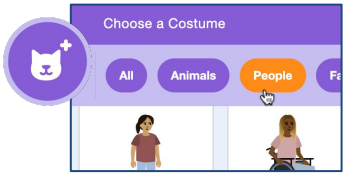
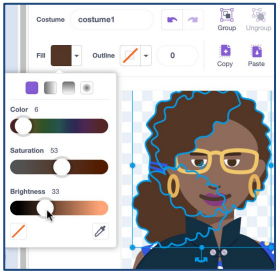
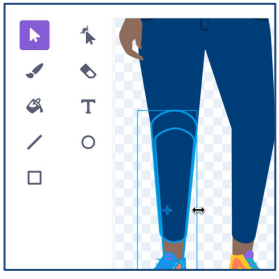
Choose two or more vector sprites with elements you like. Remember, some sprites have multiple costumes with elements/poses.

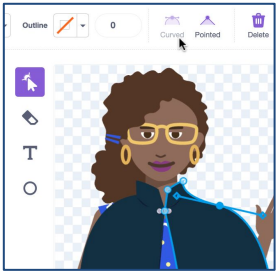




Recolor with Fill

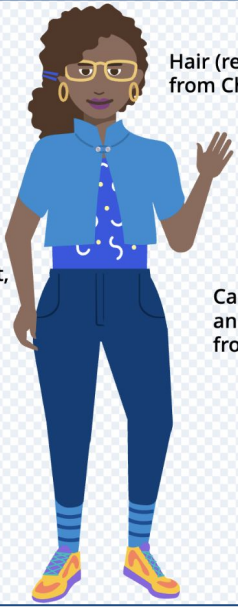


Resize with Select



Use Reshape

Main Body from Luca-b
- changed skin color
- adjusted body shape, pants height, and hairclip angle
- recolored pants and hair clip
- removed belt



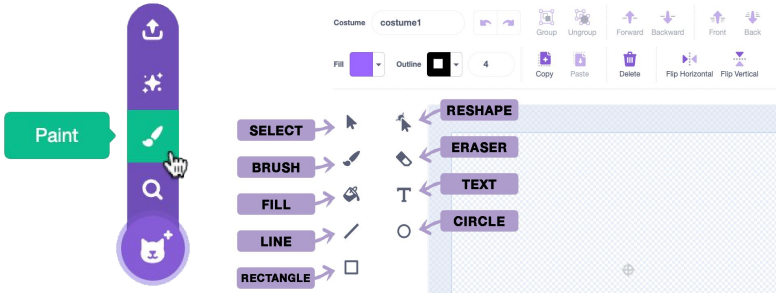
Hair (recolored) and earrings from Character1-m

Glasses and mouth (recolored) from Character2-a

Cape (recolored and reshapped) and striped socks (recolored) from Witch-a

Using the Paint Editor

TOOLS TO TRY



	Click and drag with the Line, Circle, or Rectangle tools to **create a shape**. Hold down the Shift key while dragging to create equal sides, or 45 and 90 degree angles with lines.
	Using the Select tool, select a shape and click and drag one of the corner points to **resize** it.
	To **rotate** a shape once you've made it, use the Select tool to grab the anchor under the shape and drag it. Hold down the Shift key while dragging to rotate at 45 degree angles.
	Using the Reshape tool, click on one of the points of a shape and **move the point** around to alter the shape. Click + Shift key to select and move multiple points at once.
	Using the Reshape tool, click on a part of the shape that doesn't have a point to **add a new point**, or click on a point and press "Delete" to **remove a point**.

Using the Paint Editor

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	Using the Reshape tool, click on a point and choose whether it is **curved or pointed**. Click on a point and drag rotate the handles attached to the point to **alter the shape of a curve**.
	Using the Select tool, select a shape and click the buttons on the top menu to **copy and paste** a duplicate.
	Using the Select tool, select a shape and click the flip horizontal or flip vertical buttons on the top menu to **flip** a shape.
	Using the Select tool, select a shape and click the Forward, Backward, Front, or Back buttons to change the **layer order.**
 	Select the fill from the dropdown and use the fill (paint bucket) tool to adjust a shape's color. Or using the Select tool, select a shape and then use the Fill and Outline dropdowns to adjust the **color, saturation, brightness, and outline**. You can also choose to use a **gradient**. Use the eyedropper to select a color from another shape. Use the red strikethrough to fill with no color.
	Using the select tool and holding down the "Shift" key, select multiple shapes to **group** them (helpful to move several shapes together).
	Use the brush tool for **freehand line drawing**. The example to the right shows hand drawn whiskers.
	Use the **eraser** tool to remove parts of the drawing from *all* shapes and layers it comes into contact with when clicking and dragging. You can use the reshape tool to then adjust the new points created.
	The **text** tool comes with a dropdown list of font options to choose from, and Fill and Outline dropdowns to change text color and outline.