Lecture 10: Educational robotics. Debugging Techniques

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Lesson Objectives

1) Learn the importance of debugging
2) Learn some techniques for debugging your code

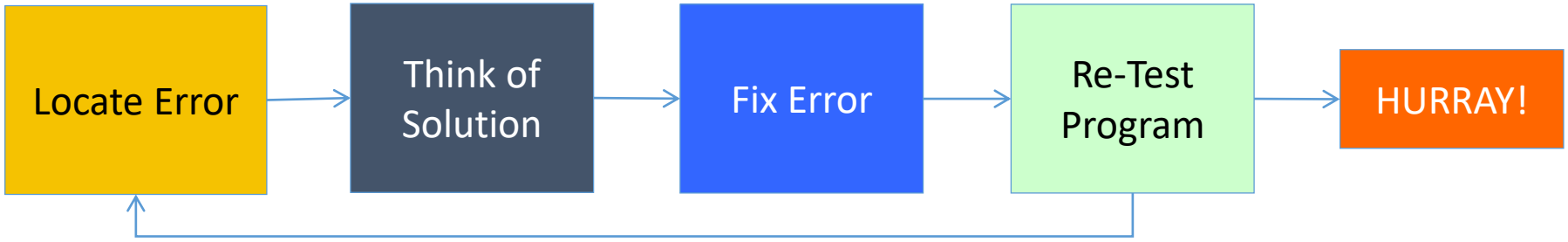
Why Debug?

Debugging is a useful strategy to figure out where in your program something is going wrong or what went wrong

Once your code starts to become long or complicated (e.g. using sensors), it can become hard to figure out where in the program you are

The following slides show you some ways of knowing where you are in your program or knowing what values your sensors see

You will see that these techniques can be VERY USEFUL to any programmer.



Different Techniques

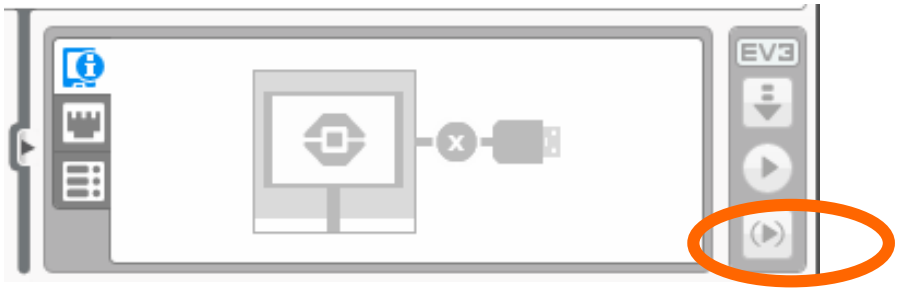
- Play Selected vs. Button Press
- Very similar techniques
- Lets you try out smaller portions of code
- Play Selected requires bluetooth
- Button Press requires some care so you don't jostle the robot when pressing the button

Light, Sound and Display

- Very similar techniques
- Light and Sound are used in the same way
- Teams enjoy the sound more and it is easier to identify sometimes
- Display Block comes in handy for knowing what block is played if your robot gets stuck and if you want to see the sensor values

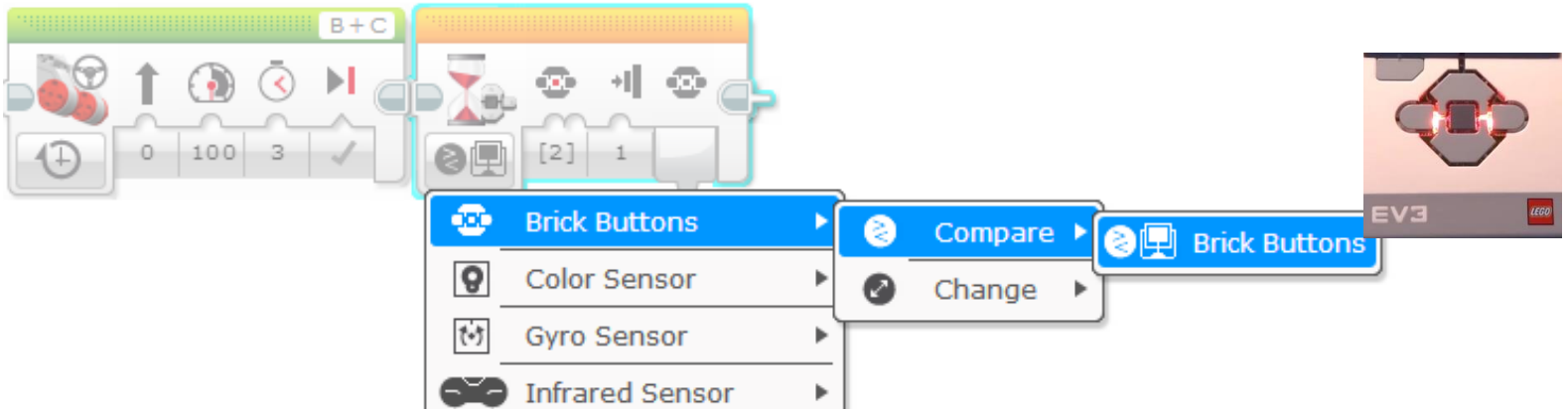
Play Selected

- Play selected is useful for running small parts of the program
- Use when you don't want to wait for your robot to complete other parts of the program before getting to the part you want to see
- If you don't have bluetooth built in the computer, we recommend that you purchase a bluetooth dongle (US $10-15) because it makes this type of debugging easier
- To use, highlight the parts of the program you want to run and pick the play button with the parentheses (>)

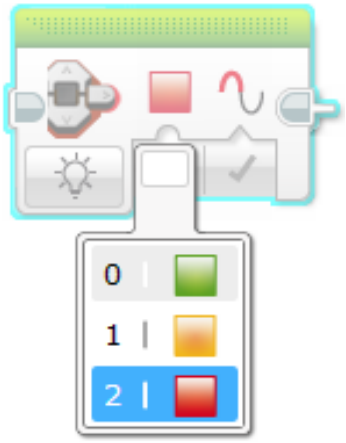


Wait For Button Press

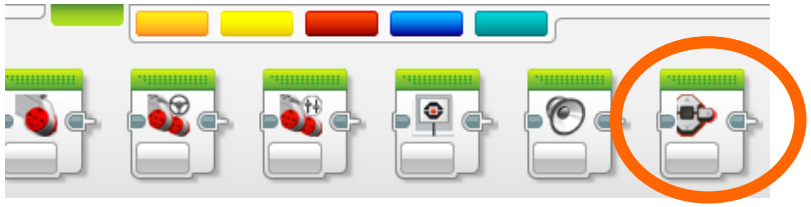
- To place a Wait for Button Press block in your program, place a wait block into your program
- Go under brick buttons > compare > brick buttons, then choose which button needs to be pressed to continue the program
- Place these wait for button presses every block or two close to where the robot is not working correctly
- This can help you pinpoint which block is causing the robot to fail
- The robot will stop and “wait for you to press the button”



Visual Alerts: Brick Status Light



- Brick status light blocks can be used for warnings

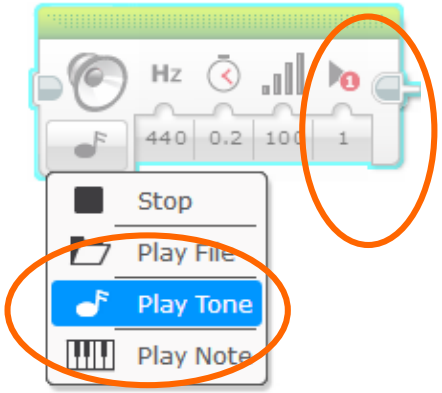


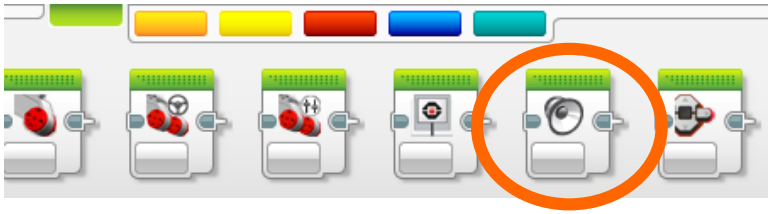
Brick Status Light block

- Place these blocks at critical steps in your program
- You will then be able to visualize what block is playing and figure out where the error might be

Sound Alerts: Sound Block

- You can insert different sounds at intervals (about every 5 blocks or so, and then run the program again while listening for beeps.
- Once you pick Play Tone, select Play Type and pick “play once”
- These sounds can help you narrow down where in the program something is going wrong.

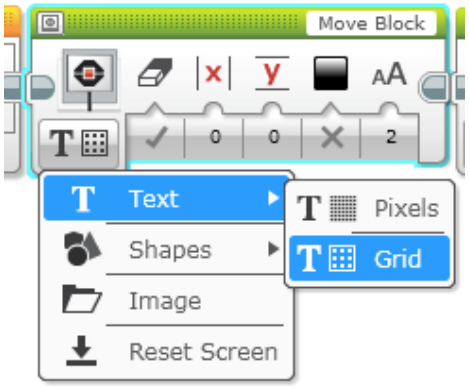


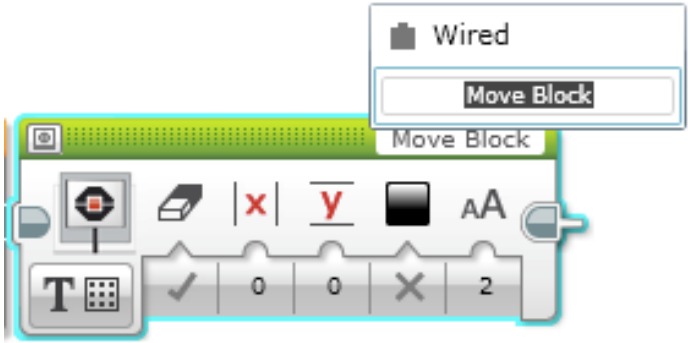


Sound block

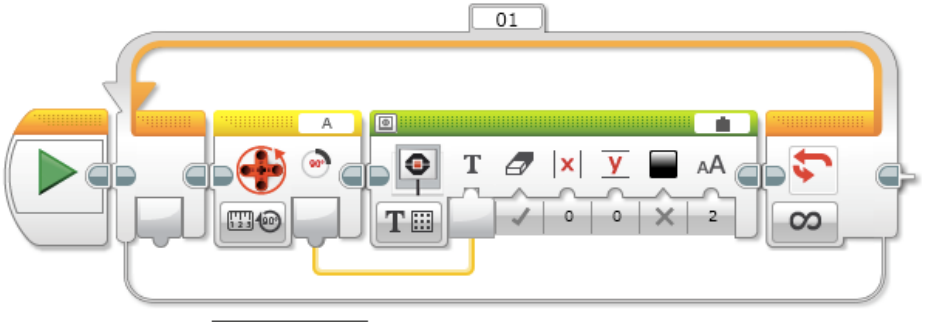
Print to Screen: Display Block

- Showing which block is playing on your robot
  - Helps identify what block the robot is stuck on





- Seeing the sensor readings – to see what the robot sees!



References

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