

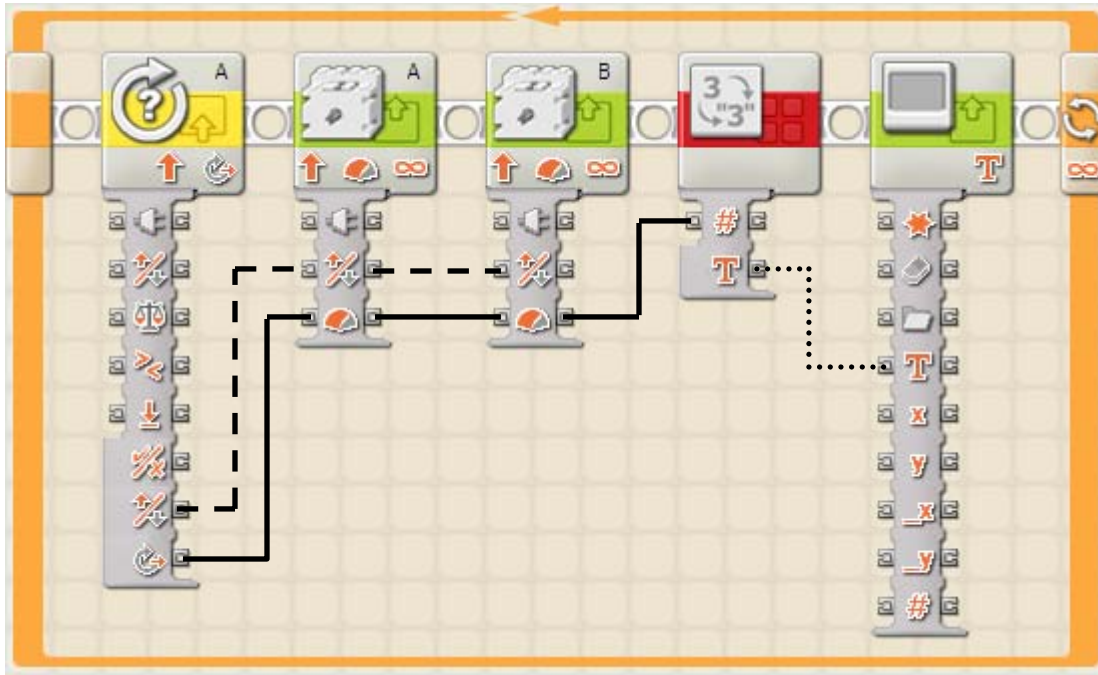
# BUILD IT

## Vertical Challenge NXT Questions

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. Consider the following incomplete program:

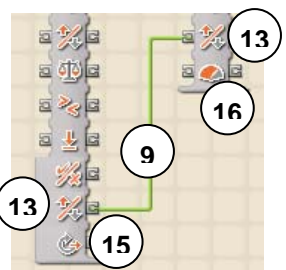
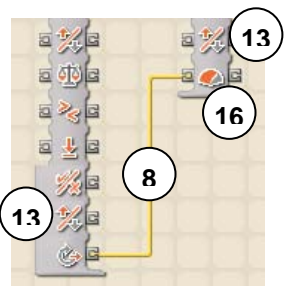
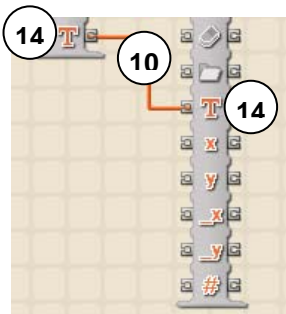


The goal of this program is to control both motors using the rotation sensor and to display the rotation angle on the screen. All that has to be done is to add data wires. Draw them in the picture above, and make sure that they are connected to the appropriate plugs so that the program will work correctly. Use **solid lines** for *number data*, **dashed lines** for *logic data*, and **dotted lines** for *text data*.

2. Next to each picture, write the number of the appropriate description.

Picture

Description



(1) Rotation Sensor

(2) Touch Sensor

(3) Loop

(4) Light Sensor

(5) Motor\*

(6) Sound Sensor

(7) Ultrasonic Sensor

(8) Number Data

(9) Logic Data

(10) Text Data

(11) Switch

(12) Number to Text Converter

(13) Direction Plug (More than one.)

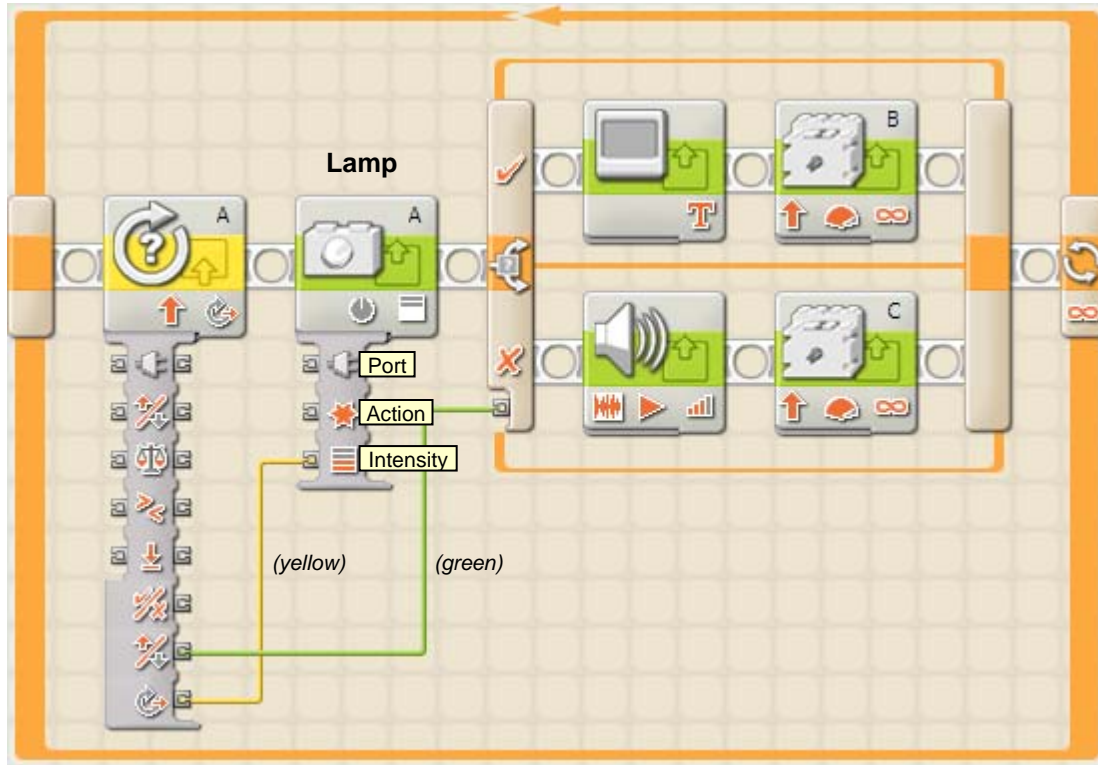
(14) Text Plug (More than one.)

(15) Degrees Plug

(16) Power Plug (More than one.)

(17) Lamp

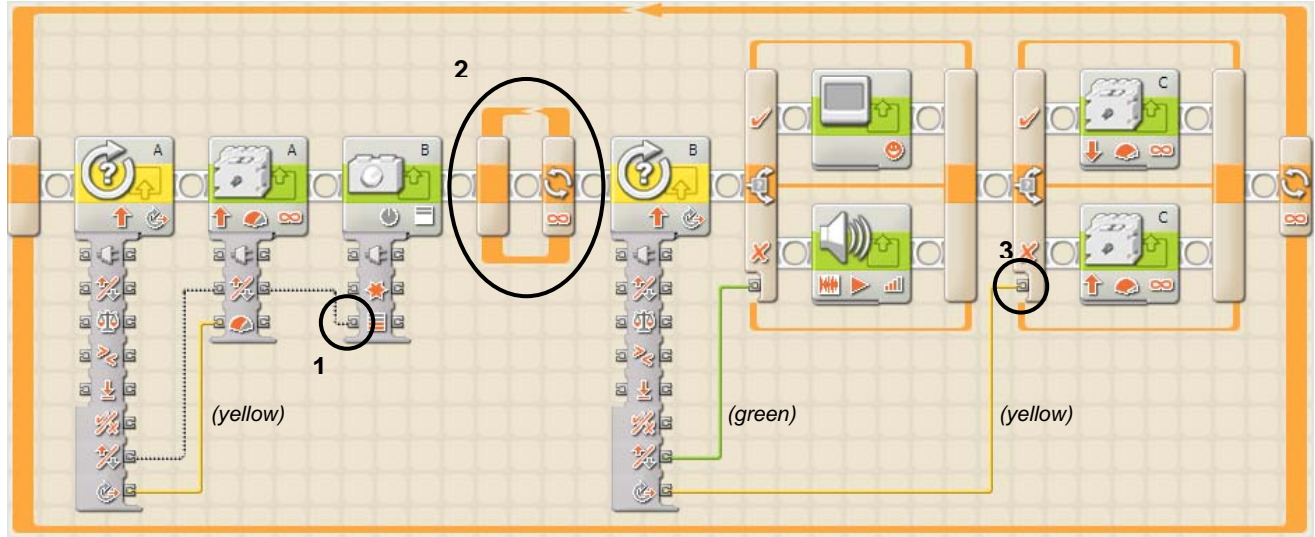
3. Consider the following program:



What does it do?

- Reads the amount of degrees rotation sensor A is turned and sends that value to lamp A. This more rotation, the brighter the lamp.
- Reads the direction that rotation sensor A was turned and uses that to do one of two things:
  - If the rotation sensor was turned forward, then some text would be displayed on the screen and motor B would run forward.
  - If the rotation sensor was turned backwards, then a sound would be played and motor C would run forward.

4. The program below has 3 problems, or bugs, which will prevent it from working correctly:



Circle each bug, put a number next to it (1, 2, or 3), and briefly describe it below.

Bug Number	Description
(1)	<i>Data wire is connecting the Direction plug, which gives <b>logic</b> data, into the Intensity plug, which receives <b>number</b> data. Since the data types don't match, the wire is bad.</i>
(2)	<i>Empty infinite loop. Once the program reaches here, it will just get stuck in the loop, doing nothing until the program is stopped.</i>
(3)	<i>Connecting the Degrees plug into the switch value plug. The switch needs a True/False or Yes/No signal – logic data. Instead, it is being sent a number, which won't work. For example, what does the switch do when it gets 73 degrees? It's not clear.</i>