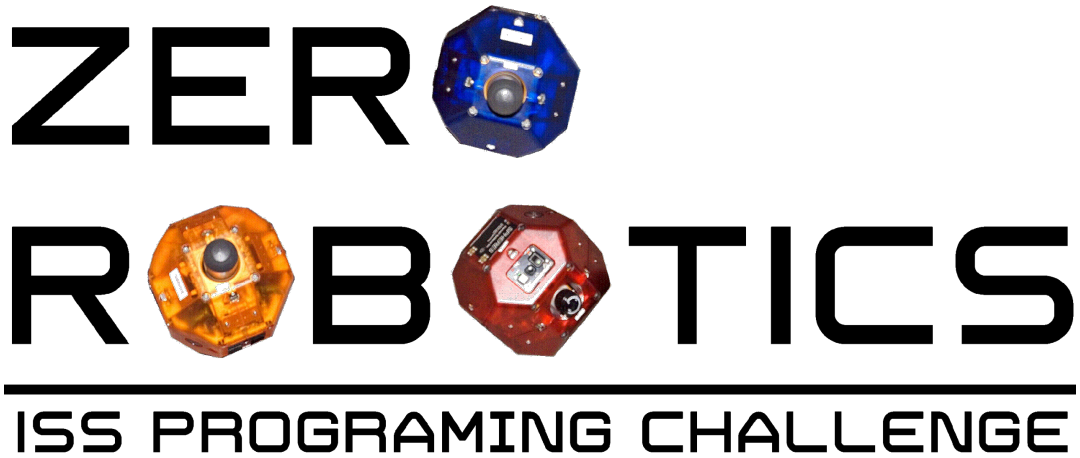


Conditionals Continued:

"Else-If"

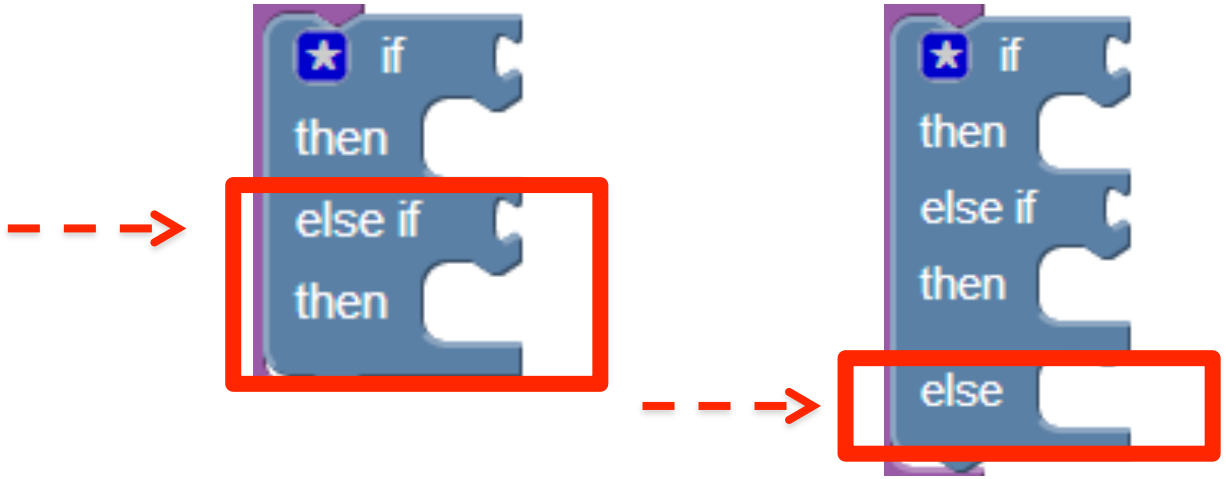
(Project 7)

Goals

- In this tutorial you will:
  - Learn to use “Else-If” statements in programming
  - Use “Save As” to create a new project

Introduction to "Else-If"

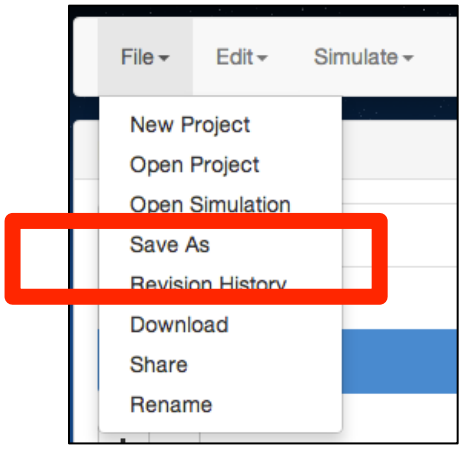
- "Else-If" statements give more flexibility in programming



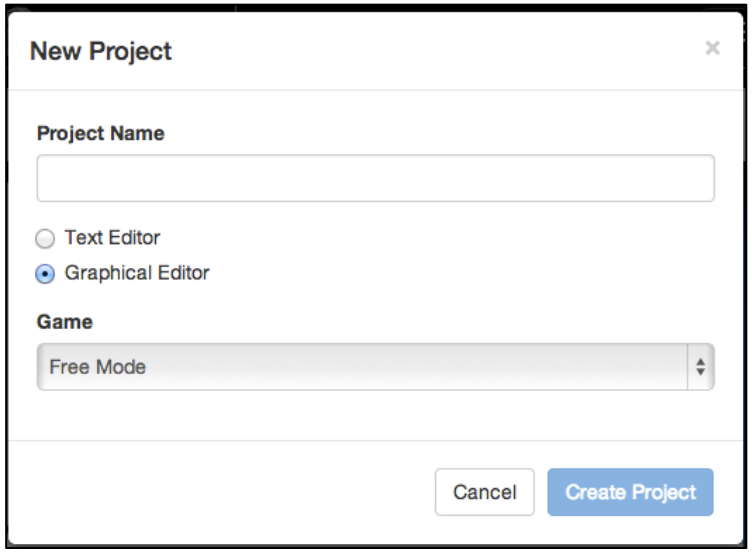
- The code in the final "**else**" slot will run when the "**If**" conditions are **not** true
  - Else statements can contain
    - Other "if" statements
    - Any other code

Use “Save As” to Create a New Project

- We will start with a simple example to show how “Else-If” statements work
- Since we will be using the variable **counter** and the arrays **positionA** and **positionB**, we will modify a program created previously.

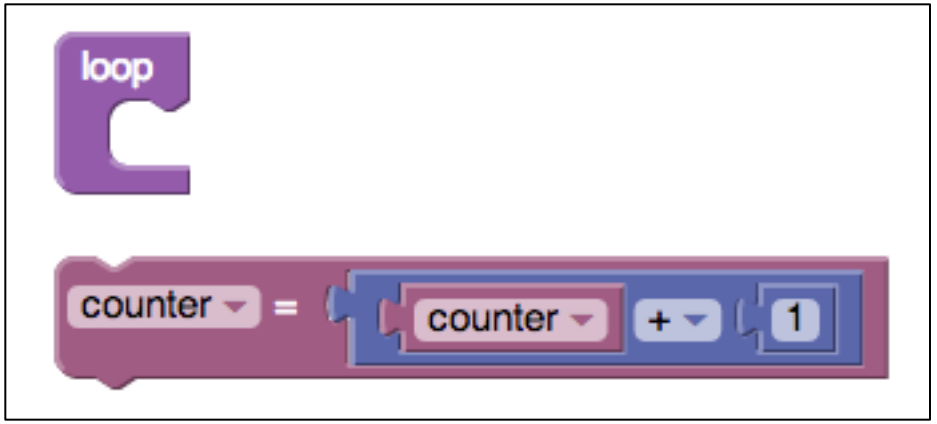


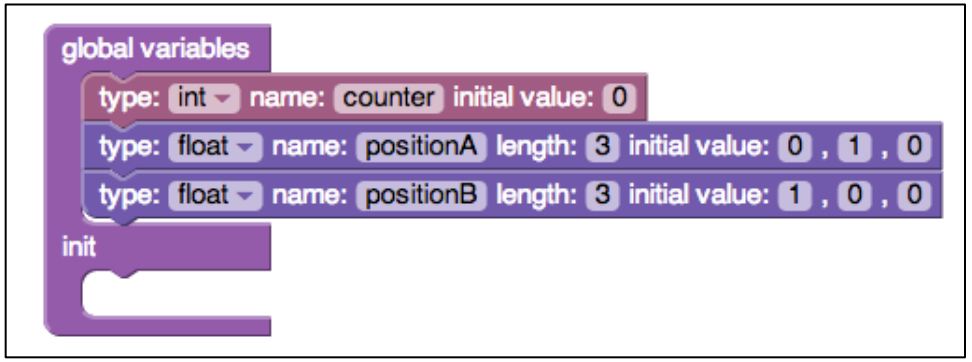
- Open the ZR IDE
- Open **Project 4** that you created previously (Conditionals: The Basics of “If-then”)
- On the menu bar select “File” and then “Save As” from the drop down menu.
  - Note: It may take several seconds for the copy to show up
- Type in **Project 7** and select **Graphical Editor** and **FreeMode**
- Click **“**Create Project”



Modify your project

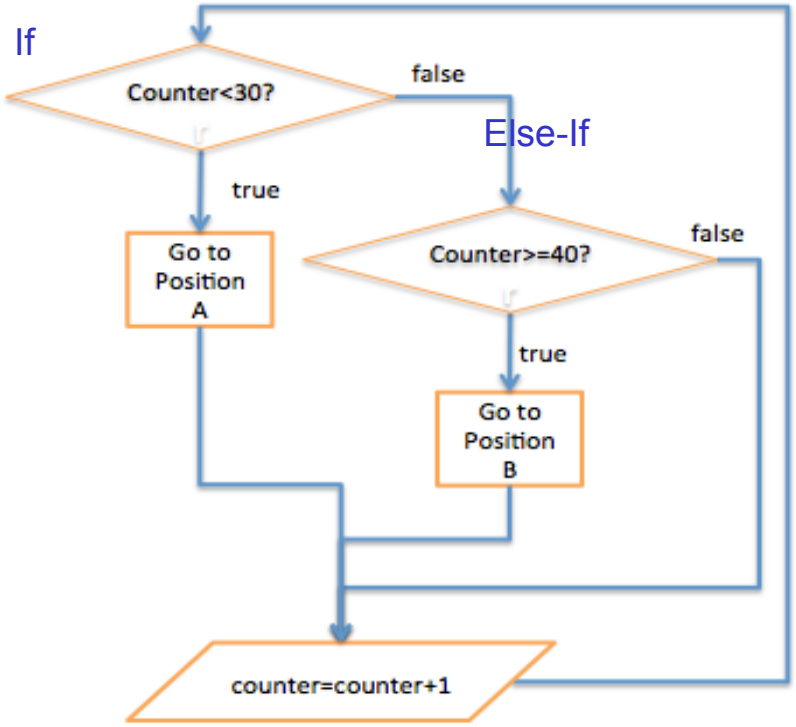
- Drag **counter = counter + 1** out of the loop but do not delete
- Delete all other blocks from the loop
- You are ready to start your new project with
  - 1 variable and 2 arrays already created
  - **counter=counter+1** block already created





Else-If

- We will create a project described by the flow diagram below

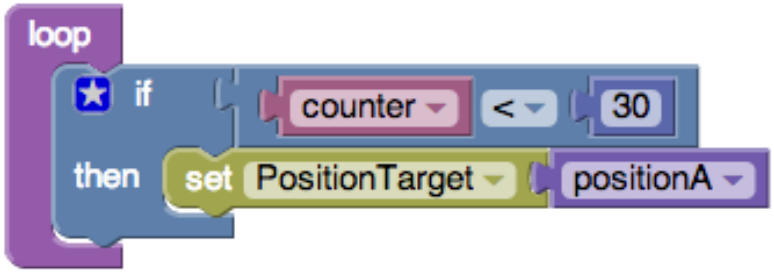


Else-If (cont.)

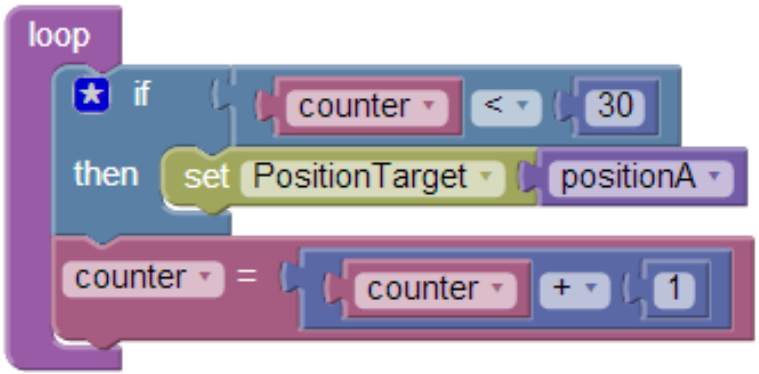
- First use what you have learned before to write code for the following "If" statement (we'll add the "Else-If" statement later on):

  "If counter < 30, go to positionA"

  Hint: Drag the "__==__" block from the logic accordion into the if statement and toggle to "<"

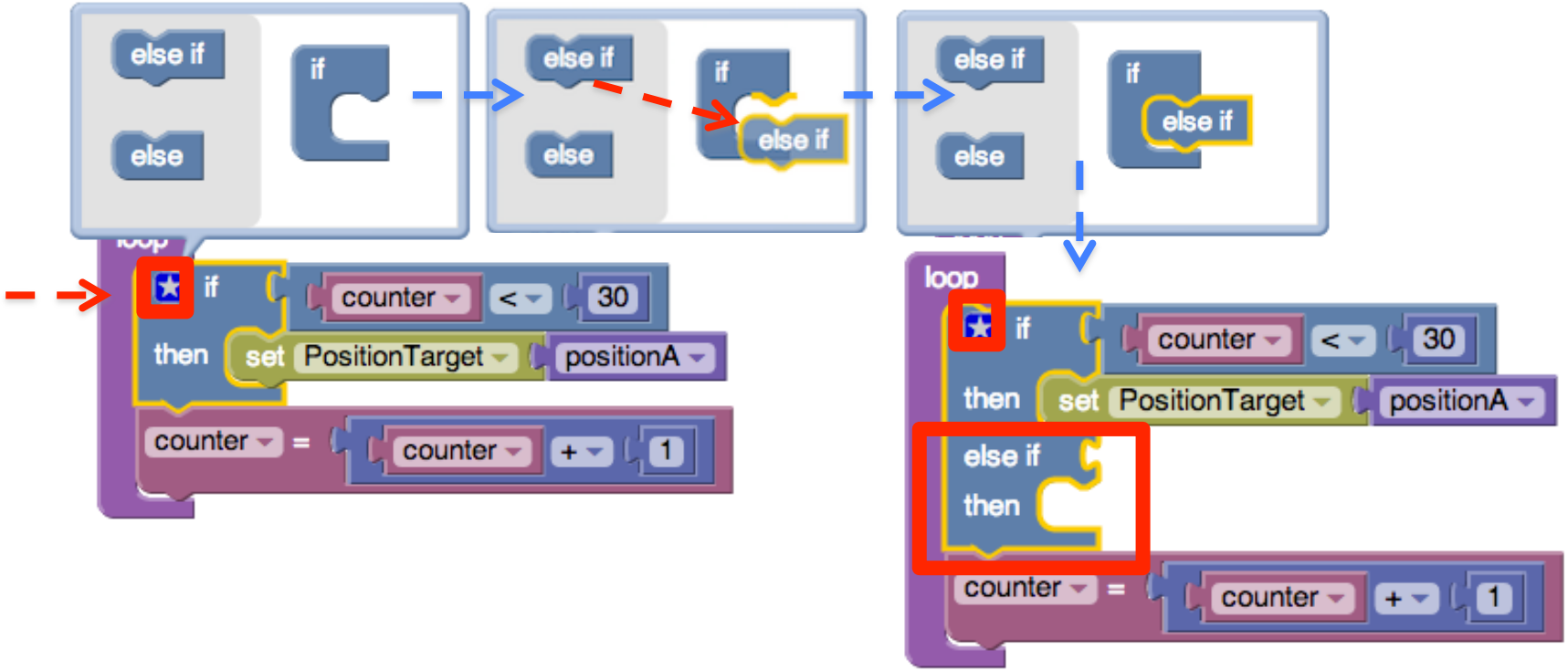


- Drag the **counter= counter +1** block back into the loop after the **if- then** block



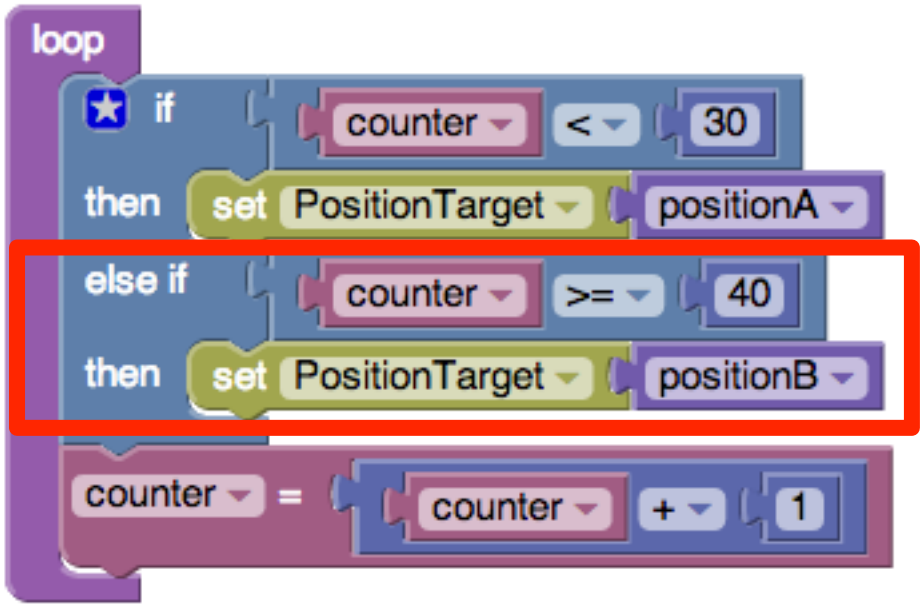
Else-If (cont.)

- Next add an **“else If”** statement below the “**if-then**” statement as follows:
  - Click the white star on the “if-then” block
  - In the popup window drag an “**else if** ” block to the “**if**” block
  - Click on the white star again to close the popup window. You will see an “**else-if**” statement has been added into the loop



Else-If (cont.)

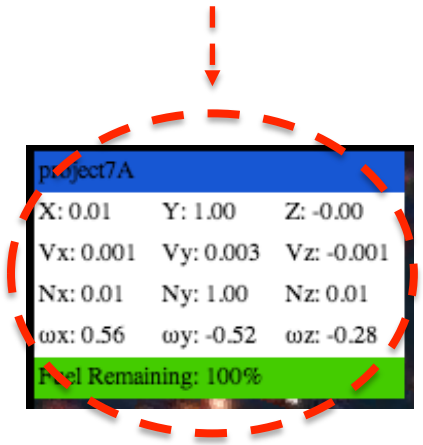
- Add (as shown)
  - Counter >= 40 logic statement
  - SPHERES Control function to setPositionTarget to positionB



Else-If (cont.)

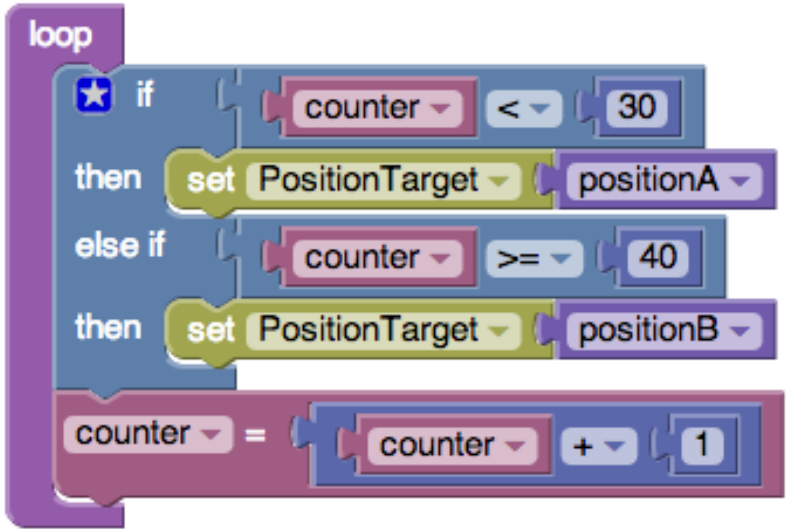
- Compile
- Simulate
  - Maximum time: 90 seconds
- View your simulation
- Watch the x,y,z position coordinates in the Scoring box and write down the x,y,z, coordinates for the Blue SPHERES when it pauses before moving to position B.
- Do the coordinates you wrote down match the coordinates entered **for position A?** Click "Back to Project" and find the declaration for positionA on the init page to find out.

Blue satellite should move from:
initial position➔ positionA ➔ pause ➔ positionB



Else-If (cont.)

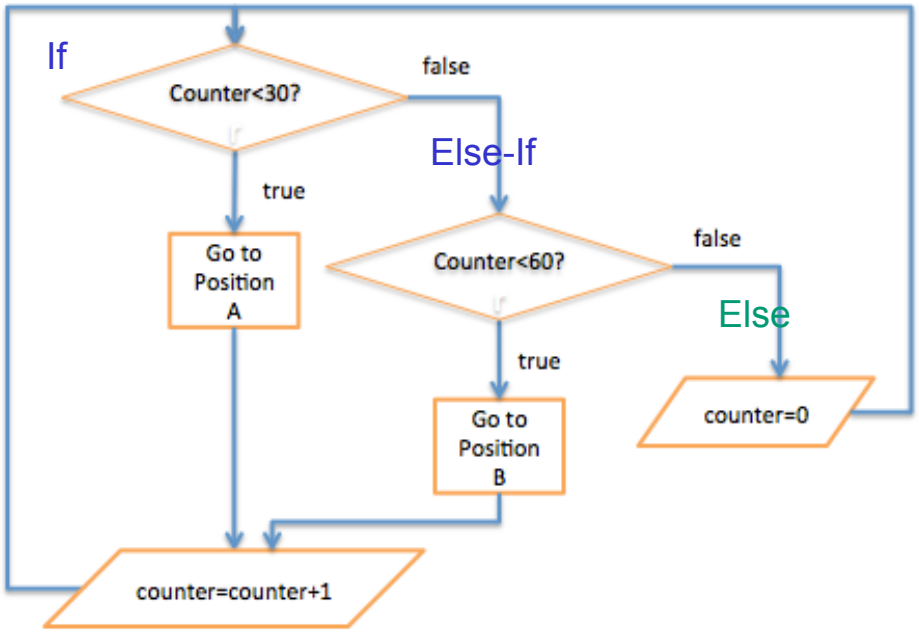
- Compare: Your program - versus - C Code




```
1 void loop() {
2   if (counter < 30) {
3     api.setPositionTarget(positionA);
4   } else if (counter >= 40) {
5     api.setPositionTarget(positionB);
6   }
7   counter = counter + 1;
8 }
```

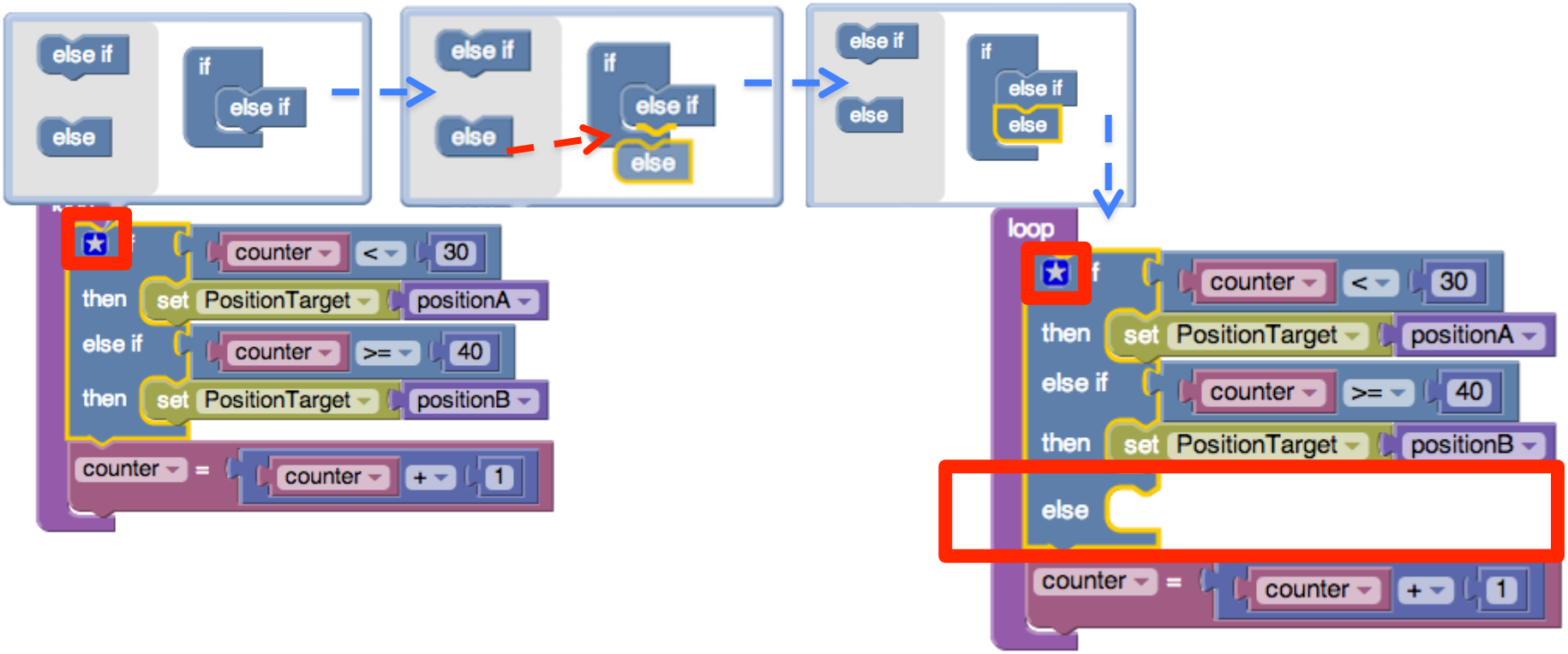
"Else-If" statements

- Now let's modify your program to match the flow diagram on the right
  - Your new program will have an "Else-If" statement followed by an "Else" statement
    - In this example, both use the same logic operator "**<**"
- The simulation for this program will be fun to watch since the "Else" statement resets the counter to "0". Can you guess what happens?



Modify your program

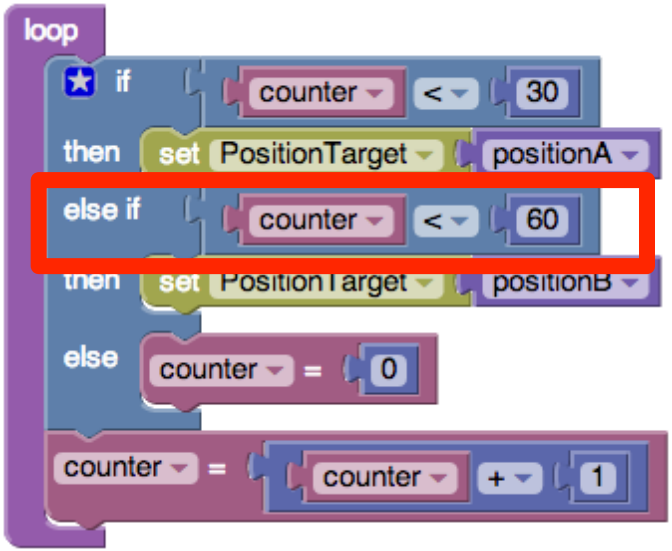
- Add an “else” statement below the “else-if” statement as follows:
  - Click the white star on the “if-then” block
  - In the popup window drag an “**else**” block into the “**if**” block below the “**else-if**” block
  - Click on the white star again to close the popup window. You will see an “**else**” statement has been added into the loop



Modify your program (cont.)

- Change the condition of the "Else-If" statement
  from: counter >= 40
  to: counter < 60

- In the "Else" clause set "**counter = 0**"
- Compile
- Simulate
  - Maximum time: **180 seconds**!!
- View your simulation

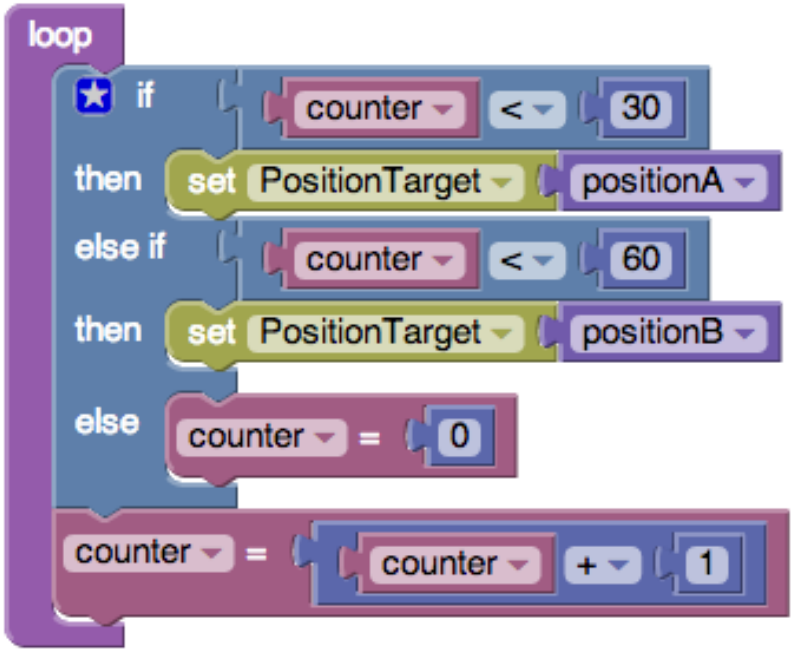


Blue satellite should move from:
initial position➔ positionA ➔ positionB

Repeat until time runs out

"Else-If" statements (cont.)

Compare: Your program - versus - C Code




```
1  void loop() {
2    if (counter < 30) {
3      api.setPositionTarget(positionA);
4    } else if (counter < 60) {
5      api.setPositionTarget(positionB);
6    } else {
7      counter = 0;
8    }
9    counter = counter + 1;
10 }
```

More about "Else-If"

- An "if, else if, else" lineup can have as many "else if" statements as you need.
- The first condition in the lineup that is satisfied will be the one performed. For example, if the "if" condition is true, it will be performed even if all other "else if" statements are also true. If there are five "else if" statements and the second one is true, only the second one will be performed.
- In the example on the previous slide, the position target will be positionA as long as counter<30, even though counter<60 is also true. The counter<30 conditional comes first.
- Like an **if** statement, an **else if** does NOT need to be followed by **else** unless there is something that needs to be done in the **else** case

Review

- Congratulations!
  - –You have learned how to:
    - Use “Else-If” statements, which will be useful for programming your satellite for the game
    - Use “Save As” to create a new project