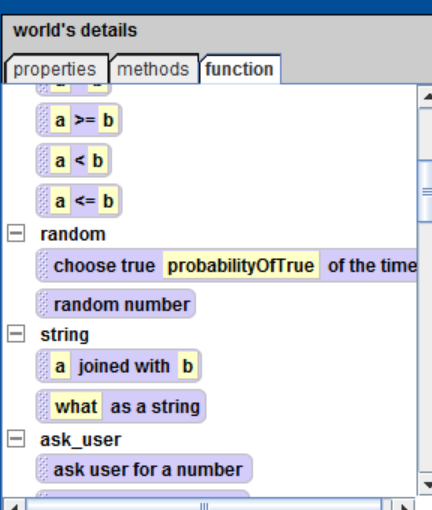
**AP Stats – Introduction to Alice Programming Name:  
Random Number Generation and Sampling**

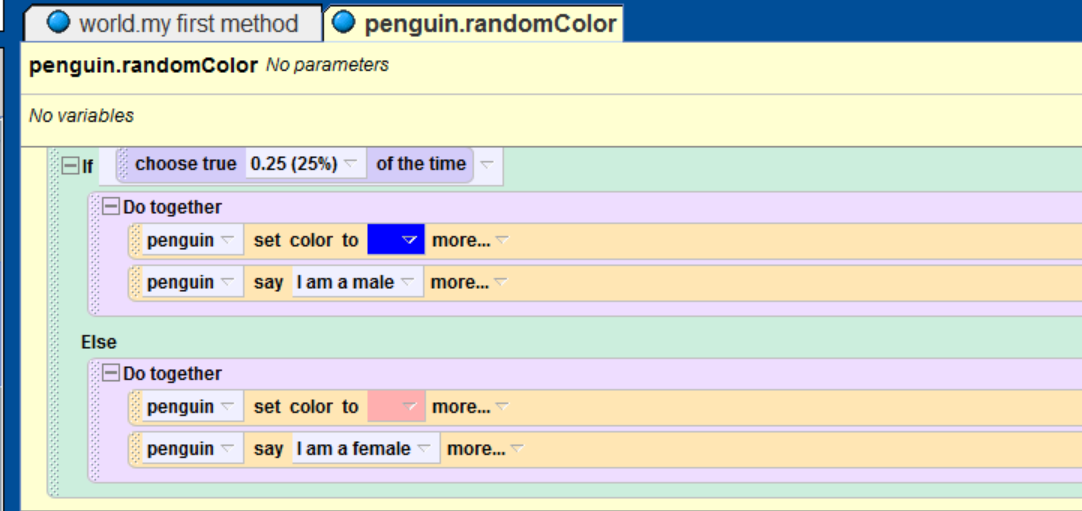
In this activity, we will learn about random number generation. We will then use it to create a simple simulation to draw samples from a population in order to estimate the population proportion.

**Starter World:** Begin by opening a new Alice world. Place a penguin into the world and size it to take up most of the screen.

**Random Color Method:** Create a Penguin method and call it *randomColor*. To begin with we are going to assume the population proportion of males in a colony of penguins is 25%. Choose *world* in the object tree and then click on the *function* tab. Cursor down until you see *random*.



Drag the *choose true* command into the *randomColor* method. Then enter .25 (25%) into the drop down. We are going to make male penguins blue and female penguins pink.



Drag an *If/Else* statement into the *randomColor* method and then drag the *choose true* command into the *if* field. Drag a *Do together* command into both the *If* and *Else* fields. In the *If* *Do together* set the penguin’s color to blue and have the penguin say, “I am a male.” In the *Else Do together* set the color to pink and have the penguin say, “I am a female.”

Play your world. If your world worked, use the *Restart* button to run your world 20 times. Keep a tally of how many males and females were in the sample and compute the sample proportion of males from your results.

Sample Proportion: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How does the sample proportion compare to the true population proportion of 0.25?

**Simulations**

You just created a simple way to simulate sampling from a population to determine the population proportion. However, it is cumbersome to have to repeatedly run the Alice world to obtain a sample of size 20.

**Challenge**: Your task is to use looping and counters to modify this world to take a sample of size *n* and count and report the *sample proportion*. When you think you have accomplished this, call me over to check your world.

* Proper use of looping technique
* Proper use of counters
* Accurate computation and reporting of sample proportion