CPSC203 – Introduction to Problem Solving and Using Application Software

Winter 2010
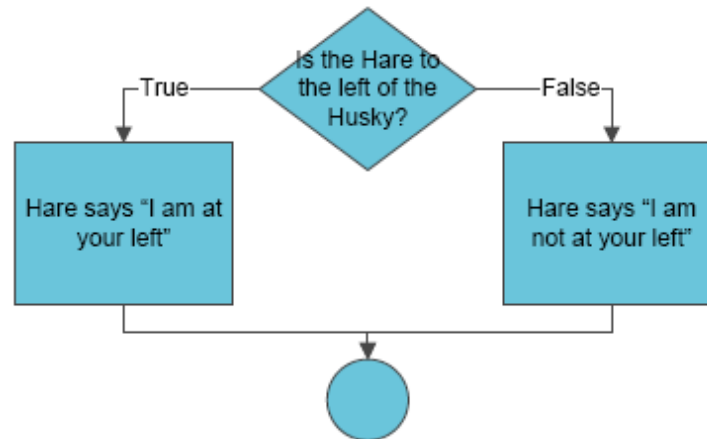
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Introduction

- Conditional Execution (If/Else)

- Relational Operators

- Randomness

- Repetition (Loops)

- While Loops

Conditional Execution

- The conditional execution can be performed by the *If/Else* control structure.

- This structure checks a specified condition, and makes a decision about whether or not a section of the code will be run.

- All conditions in the *If/Else* structure must evaluate to a Boolean (either true or false) value.

I'm at your left

- A hare and a husky stand next to each other. If the Hare is to the left of the Husky, the Hare says "I am at your left". Otherwise, it says "I am not at your left".

Exercise

- Grab the following Alice program file from:
  http://pages.cpsc.ucalgary.ca/~kawash/peeking/tutorials/lab3If1.a2w

- Complete the above code so that the instructions in the flowchart are performed. In the scene window, move the husky or hare around (using your mouse) to test your code.

- Hint: Click the hare in the object tree window, or in the scene. From the functions tab in the details window, drag the hare's function "is to the left of" into the space for the condition.

Relational Operators

Operator	Description
A==B	Is A equal to B?
A!=B	Is A not equal to B?
A>B	Is A greater than B?
A>=B	Is A greater than or equal to B?
A<B	Is A less than B?
A<=B	Is A less than or equal to B?

1. We can use relational operators to write our own conditions.
2. The result of a relational operation is a Boolean value.
3. To use relational operators, click on *world* in the object tree. Go to the functions of the *world* object. Underneath the heading *math*, you will notice the relational operators.

Exercise

- Make the husky to scratch its ears (use the method *husky.ScratchEar*) and wag its tail (use the method *husky.WagTail*) for 2 seconds (in parallel) if the height of the hare is less than or equal to 2.

- Otherwise, the husky has to walk a number of cycles (use the method *husky.WalkCycle*) equal to the hare's height.

Randomness

- We can introduce randomness into our programs.

- We can set the size of the hare to a random size at the beginning of the program using the world function *random.*

- Modify the program so that the hare is resized randomly to a number between 0.1 and 1.5 its original size.

Repetition

- The *Loop* control statement can be used to repeat a number of instructions.

- Drag *Loop* from the statement bar to the editor and specify the number of repetitions.

- The statements in the body of the *Loop* block are repeated the given number of times.
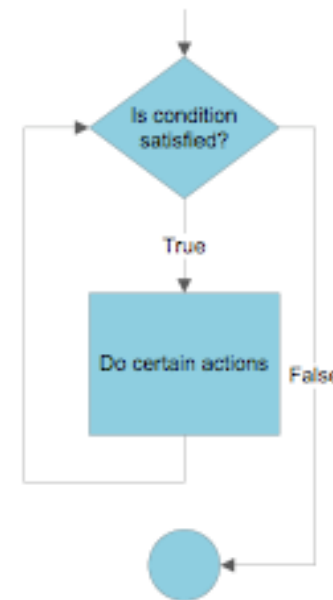
Exercise

- Grab the following Alice program file from:
  http://pages.cpsc.ucalgary.ca/~kawash/peeking/tutorials/lab3Rep.a2w

- Get the robot to kick its left leg and at the same time point its cannon forward.

- The robot must return to its initial position each time.

- The robot needs to repeat this three times.

- The robot must also get smaller by 0.9 at every repetition.

While Loops (1)

- Sometimes we don't know the exact number of repetitions.

- For example, in the previous exercise suppose that we want to repeat everything while the height of the robot is greater than 1.

- The *While* control statement keeps repeating the code inside its block until the *While* condition becomes false.

While Loops (2)

- When the condition is false, the program continues to execute the code that comes after the *While block.*

Exercise

- Modify the previous program so that the robot does it moves and shrinks by 0.9 while its height is greater than 1.