CompSci 94
Random Numbers, Making Decisions with If statements
September 24, 2019

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Constant Variable

• What is a constant variable?

• How do you create a constant variable in Alice?

• How do you use a constant variable?
Constant Variable

• What is a constant variable?
  – Storage location
  – Can only store one value there

• How do you create a constant variable in Alice?
  – Drag in variable tile
  – Be sure to select constant
  – Give it a type and initial value

• How do you use a constant variable?
  – Use it in place of anything of the same type
Random Numbers

• What is a random number?

• In Alice, how does one get a random number in an instruction?

• Give examples of numbers in this range?
Random Numbers

• What is a random number?
  – Some number from a range of numbers
  – Don’t know which number until it is generated

• In Alice, how does one get a random number in an instruction?
  – Put in a number first, then can select “random”

• Give examples of numbers in this range?
  – 0.5, 0.79, 1.3, 1.98
Random Integers

• How many different integers are a possibility with this statement?
Random Integers

• How many different integers are a possibility with this statement?

  – 3 possible numbers. They are: 2, 3, 4
  – Note this says …UpToButExcluding
If statements

• What types can you compare in an if statement?
If statements

• What types can you compare in an if statement?
  – Numbers
  – Directions
  – Paints
  – TextStrings
  – Objects
  – etc
Panda distanceTo

• What does this code do when it executes?

```plaintext
if (this.panda.getDistanceTo(this.bunny) > 2.0) {
    this.panda.moveToward(this.bunny, 2.0);
} else {
    this.panda.say("I'm here");
}
```
Panda distanceTo

• What does this code do when it executes?

  ```
  if this.panda getDistanceTo this.bunny > 2.0 is true then
  this.panda moveToward this.bunny, 2.0 add detail
  else
  this.panda say "I'm here" add detail
  ```

  – If the panda is more than two units from the bunny, the panda moves two units towards the bunny
  – Otherwise the panda says “I’m here”

• If the panda is 3 units from the bunny, can both the panda move and say “I’m here” happen?
  – NO! only one happens
Create line w/ Panda distanceTo

• How does one create **first line** of this code?

```
if this.panda.getDistanceTo(this.bunny) > 2.0
    then
        this.panda.moveToward(this.bunny, 2.0)
    else
        this.panda.say("I'm here")
```
Create line w/ Panda distanceTo

- How does one create **first line** of this code?

- First drag in an IF tile and select True
- Then click on True and select *decimal number compare with greater than*

```plaintext
Relational (DecimalNumber) { ==, !<, <, <=, >=, > }
Relational (WholeNumber) { ==, !<, <, <=, >=, > }
Relational (SThing) { ==, !< }  
Relational (MoveDirection) { ==, !< }  
Relational (TurnDirection) { ==, !< }  
```
Create line w/ Panda distanceTo

- How does one create **first line** of this code?

  - First drag in an IF tile and select True
  - Then click on True and select *decimal number compare with greater than*
  - Select numbers 1.0 and 2.0
  - Replace the 1.0 by dragging the function over it
Making decisions - If statement

• What happens when this code runs?

```plaintext
if (this.panda.getPaint() != RED) {
    this.panda.setPaint(REDD); add detail;
} else {
    this.panda.setPaint(BLUE); add detail;
}
```

```plaintext
if (this.panda.getPaint() != RED) {
    this.panda.setPaint(REDD); add detail;
} else {
    this.panda.setPaint(BLUE); add detail;
}
```
Making decisions - If statement

• What happens when this code runs?

– Panda turns red and then panda turns blue
What happens when this If executes?

```plaintext
if this.bunny isBehind this.panda add detail is true then
    this.bunny turn RIGHT, ≥ 0.5, asSeenBy this.panda
else
    this.panda turn RIGHT, ≥ 0.5, asSeenBy this.bunny
```
What happens when this If executes?

```plaintext
if this.bunny isBehind this.panda add detail is true then
  this.bunny turn RIGHT, ≧ 0.5, asSeenBy this.panda
else
  this.panda turn RIGHT, ≧ 0.5, asSeenBy this.bunny
```
Execute a copy of the if again?
Execute a copy of the if again?
Execute a third copy of the if?
Execute a third copy of the if?

```plaintext
if this.bunny isBehind this.panda add detail is true then
  this.bunny turn RIGHT, ≥ 0.5, asSeenBy this.panda
else
  this.panda turn RIGHT, ≥ 0.5, asSeenBy this.bunny
```
Announcements

• Exam 1 is Oct 10
• Assignment 3 due in one week
  – Have you started yet?
• QZ9 due Sept 26 – 8:30am
Class Today

• Working with random numbers and making decisions