

Sonic Pi Generative Music Unit Plan

Lesson # 5 - Conditional Statements

Lesson Objectives

Students will be able to use conditional statements to provide different possible musical outcomes based on randomly generated conditions stored in variables

Suggested Duration

1 period (45 minutes)

NYS Computer Science and Digital Fluency Learning Standards

7-8.CT.6 *Design, compare and refine algorithms for a specific task or within a program.*

7-8.CT.7

Design or remix a program that uses a variable to maintain the current value of a key piece of information.

7-8.CT.9 *Read and interpret code to predict the outcome of various programs that involve conditionals and repetition for the purposes of debugging.*

Vocabulary

Assessments

- Assess _____. Check for the ability to:
 - Make if/else conditional statements
 - Store a randomly generated value in a variable
 - Accurately use single line conditional statements
 - Create nested conditional statements

Do Now

Have students log into Peardeck

Have students iterate through code to explain what is happening

```
1
2 live_loop :conditional do
3   use_random_seed Time.now.to_i
4   if rand_i == 0
5     | play 60
6     | sleep 1
7   else
8     | play 80
9     | sleep 1
10  end
11 end
```

Get students responses to explain what this code is doing

Lesson

Part 1 - Single Line conditional statements

1. In Sonic Pi, there is a way we can simplify a conditional statement into a single line of code:

This:

```
2 live_loop :conditional do
3   use_random_seed Time.now.to_i
4   if rand_i == 0
5     | play 60
6   end
7   sleep 1
8 end
```

Is the same as this:

```
2 live_loop :conditional do
3   use_random_seed Time.now.to_i
4   play 60 if rand_i == 0
5   sleep 1
6 end
```

This can be a good way to simplify our code to make it more readable and not have to add extra 'end's which are hard to keep track of and can make our code more confusing to read

2. Ask students how we might refactor the code in the Do Now using this method.

Possible student solution:

```
2 live_loop :conditional do
3   use_random_seed Time.now.to_i
4   play 60 if rand_i == 0
5   play 80 if rand_i == 1
6   sleep 1
7 end
```

3. Have students copy and paste code sample from Peardeack into an empty buffer and observe what happens.

```
1 live_loop :conditional do
2   use_random_seed Time.now.to_i
3   puts "flip!"
4   play 60 if rand_i == 0
5   play 80 if rand_i == 1
6   sleep 1
7 end
```

Write observation in Peardeck slide

Possible observations: Sometimes nothing plays, sometimes two notes play

4. Have students turn and talk to discuss predictions as for why this may be. Have students write predictions in Peardeck
5. Remind students that `rand_i` is a function that will return either 0 or 1 Just like flipping a coin

Explain code: If `rand_i` is a coin that we are flipping, when we have `rand_i` written twice in our code, it is like we are flipping two different coins. Sometimes they will both be heads, sometimes they will both be tails, sometimes one will be heads and one will be tails.

Have students change the second if statement to `rand_i == 0`
They will see that the program behaves the same

Explain to students that there isn't necessarily anything wrong with this approach and it could be useful in their program if they wanted to have a different number of notes play each time

6. If they want to just have one note play each time, they need to store the result of the coin flip (`rand_i`) in a variable and use that variable name in the condition.

```
2 live_loop :conditional do
3   use_random_seed Time.now.to_i
4   flip = rand_i #variable to store result of rand_i
5   play 60 if flip == 0
6   play 80 if flip == 1
7   sleep 1
8 end
```

Part 2 - Exercise

Create a live loop.
Store the results of the dice roll in a variable.
Have a different note play for each number on the dice.
Use single line conditional statements.

Part 3 - Homework assignment

1. Present students with Choose Your Own Adventure Template
[Lesson 5 - Out of Class Assignment](#)
2. Explain directions.
3. Go through Example assignment.
[Lesson 5 - Out of Class Assignment - Example](#)
4. Assignment should be done on Google Classroom

Wrap Up/Assessment

Present example code of solution for Dice roll exercise.

Example of end result

```
2  live_loop :conditional do
3    use_random_seed Time.now.to_i
4    roll = dice
5    play 50 if roll == 1
6    play 55 if roll == 2
7    play 60 if roll == 3
8    play 65 if roll == 4
9    play 70 if roll == 5
10   play 75 if roll == 6
11   sleep 1
12 end
```

Choose Your Own Adventure Story

Line 1 - Create a scenario where a character is presented with a choice (Give two options)

| |
|------------------|
| |
| Option 1: |
| Option 2: |

If your character chooses the first option from line 1:

Write the outcome of the character's choice on line 2. This outcome should result in having to make another choice.

Line 2

| |
|------------------|
| |
| Option 1: |
| Option 2: |

If your character chooses the first option from line 2:

Write the outcome of the character's choice on line 3. This should end the story.

Line 3

| |
|--|
| |
|--|

If your character chooses the second option from line 2:

Write the outcome of the character's choice on line 4. This should end the story.

Line 4

| |
|--|
| |
|--|

If your character chooses the second option from line 1:

Write the outcome of the character's choice on line 5. This outcome should result in having to make another choice.

Line 5

| |
|-----------|
| |
| Option 1: |
| Option 2: |

If your character chooses the first option from line 5:

Write the outcome of the character's choice on line 6. This should end the story.

Line 6

| |
|--|
| |
|--|

If your character chooses the second option from line 5:

Write the outcome of the character's choice on line 7. This should end the story.

Line 7

| |
|--|
| |
|--|

Choose Your Own Adventure Story - Example

Line 1 - Create a scenario where a character is presented with a choice (Give two options)

You enter a room. On the table in this room, there is a plate of cookies and a single cupcake.

Option 1: You eat the cookie

Option 2: You eat the cupcake

If your character chooses the first option from line 1:

Write the outcome of the character's choice on line 2.

This outcome should result in having to make another choice.

Line 2

Eating the cookie has given you the power to read people's minds.

Option 1: You see a doctor to try and figure out what has happened

Option 2: You use this power to your own benefit

If your character chooses the first option from line 2:

Write the outcome of the character's choice on line 3. This should end the story.

Line 3

The doctor discovers that the effects are only temporary. You spend the day resting at home and are back to normal the next day.

If your character chooses the second option from line 2:

Write the outcome of the character's choice on line 4. This should end the story.

Line 4

You use this power to find out the answers to your math test. You get in trouble for cheating, fail the test and can no longer read minds.

If your character chooses the second option from line 1:
Write the outcome of the character's choice on line 5.
This outcome should result in having to make another choice.

Line 5

The cupcake causes all your hair to fall out.

Option 1: You get a wig

Option 2: You wear a hat.

If your character chooses the first option from line 5:
Write the outcome of the character's choice on line 6. This should end the story.

Line 6

The adhesive from the wig causes an allergic reaction to your scalp. Your hair never grows back and your head becomes too sensitive to cover up with anything else.

If your character chooses the second option from line 5:
Write the outcome of the character's choice on line 7. This should end the story.

Line 7

While wearing the hat, Someone on the street mistakes you for someone they owe \$1000 to. They give you the money and you use it to buy the latest iPhone. Your hair grows back two days later.