



Unit 2: for loops with the TI-Innovator™ Hub

Application: Computer Music

In this lesson you will generate random computer music.

Objectives:

- Use the **for** loop to control the number of notes
- Use the random number generator to create random musical notes

In this unit you used **for** loops to control light, colors, and sounds. In this application, you will create a program to play computer-generated random sound or music. This challenge can take three approaches: a) play purely random tones (frequencies), b) play random notes using their special frequencies, or c) play random notes using their names (in a list). You will also use random durations (timings) for each tone/note. And, for the icing on the cake, each note can create a different color using the color LED.

1. Make a new Python Hub Project (this one is named MUSICB) and import **color** and **sound** from the [math] ti_hub... menu.

You will also need a function that can produce ‘random’ numbers. These functions are part of the standard Python commands but are found in a separate module that the Hub Project template does not import.

Press [math] random... and add the statement

from random import *

to your collection of **import** statements at the top of your code.

```

EDITOR: MUSICB
PROGRAM LINE 0007
# Hub Project
from ti_system import *
from time import *
import color
import sound
from random import *
-
Fns... a A # Tools Run Files

```

2. Write an **input** statement to enter the number of sounds to play (**n**).

Convert the value of **n** to an integer.

Use **n** in a **for** loop to play the random sounds.

```

EDITOR: MUSICB
PROGRAM LINE 0011
# Hub Project
from ti_system import *
from time import *
import color
import sound
from random import *

n=input("number of notes?")
n=int(n)
for i in range(n):
--
-
Fns... a A # Tools Run Files

```

3. Use the **randint()** function found in [math] random...

r = randint(,)

The variable **r** is assigned a *random integer* from *min* to *max* for later use. *min* and *max* will be replaced with numbers. But, before you enter those numbers, consider the next step...

```

EDITOR: MUSICB
random module
random
1:from random import *
2:random( )
3:uniform(min,max)
4:randint(min,max)
5:choice(sequence)
6:randrange(start,stop,step)
7:seed()
Esc

```

4. **r** represents a sound frequency. Not all frequencies are ‘audible’. Very small frequencies and very large frequencies should be avoided

