EdPy worksheets

Student worksheets and activity sheets

Name_____

Lesson 5: Worksheet 5.1 – Play tones

In this activity, you need to write a program to make Edison play a musical note and learn how Edison plays sounds in a program.

You can play individual musical notes through Edison's small speaker using the Ed.PlayTone() function in EdPy.

The Ed.PlayTone() function takes two input parameters: the note and the duration. The note determines what note to play and the duration determines the given length of time the note should be played.

This list includes the possible parameter values:

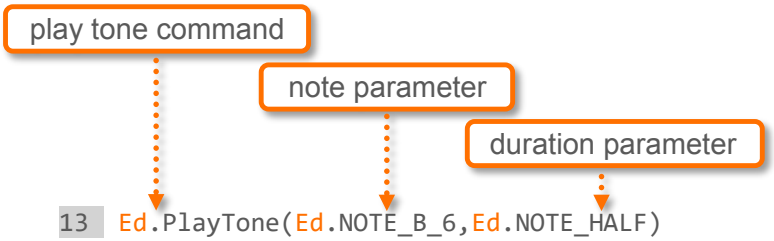
note

Parameter input options	Plays musical note
Ed.NOTE_A_6	low A
Ed.NOTE_A_SHARP_6	low A sharp
Ed.NOTE_B_6	low B
Ed.NOTE_C_7	C
Ed.NOTE_C_SHARP_7	C sharp
Ed.NOTE_D_7	D
Ed.NOTE_D_SHARP_7	D sharp
Ed.NOTE_E_7	E
Ed.NOTE_F_7	F
Ed.NOTE_F_SHARP_7	F sharp
Ed.NOTE_G_7	G
Ed.NOTE_G_SHARP_7	G sharp
Ed.NOTE_A_7	A
Ed.NOTE_A_SHARP_7	A sharp
Ed.NOTE_B_7	B
Ed.NOTE_C_8	high C
Ed.NOTE_REST	rest

duration

Parameter input options	Plays note for
Ed.NOTE_SIXTEENTH	125 milliseconds
Ed.NOTE_EIGHTH	250 milliseconds
Ed.NOTE_QUARTER	500 milliseconds
Ed.NOTE_HALF	1,000 milliseconds
Ed.NOTE_WHOLE	2,000 milliseconds

Let's take a closer look at the play tone function in a program:



Using the parameter values tables as a reference, can you work out what the program will do?

This program will play a low B note for a duration of 1 second.

Name_____

Your turn:

Task 1: Play a note

Write the following program:

```
1
2  #-------------Setup----------------
3
4  import Ed
5
6  Ed.EdisonVersion = Ed.V2
7
8  Ed.DistanceUnits = Ed.CM
9  Ed.Tempo = Ed.TEMPO_MEDIUM
10
11 #--------Your code below-----------
12
13 Ed.PlayTone(Ed.NOTE_A_SHARP_7,Ed.NOTE_HALF)
14
```

Download and test the program to see what it sounds like.

Task 2: Play a note, then drive? Or play a note while driving?

When Edison plays sounds, it does this in the background. This means that as soon as Edison starts playing the sound, the program will move onto the next line of code. The sound will keep playing 'in the background' while Edison continues on with the program.

If you want Edison to wait for the sound to finish, you need to use the Ed.ReadMusicEnd() function in a 'while' loop.

Write the following program:

```
1
2  #-------------Setup----------------
3
4  import Ed
5
6  Ed.EdisonVersion = Ed.V2
7
8  Ed.DistanceUnits = Ed.CM
9  Ed.Tempo = Ed.TEMPO_MEDIUM
10
11 #--------Your code below-----------
12 Ed.PlayTone(Ed.NOTE_C_8, Ed.NOTE_WHOLE)
13 while Ed.ReadMusicEnd()==Ed.MUSIC_NOT_FINISHED:
14     pass
15 Ed.Drive(Ed.FORWARD, Ed.SPEED_6, 5)
16
```

Download and test the program.

Name_____

1. Describe what happened when you ran this program.

_____

_____

_____

2. Look at line 13 and 14 of the program. Remember that expressions compare the left side to the right side of the notation in the expression. What is this loop doing?

_____

_____

_____

Write the following program:

```
1
2  #-------------Setup---------------
3
4  import Ed
5
6  Ed.EdisonVersion = Ed.V2
7
8  Ed.DistanceUnits = Ed.CM
9  Ed.Tempo = Ed.TEMPO_MEDIUM
10
11 #--------Your code below-----------
12 Ed.PlayTone(Ed.NOTE_C_8, Ed.NOTE_WHOLE)
13 Ed.Drive(Ed.FORWARD, Ed.SPEED_6, 5)
14
```

Download and test the program.

3. Describe what happened when you ran this program.

_____

_____

_____

4. Why did this program behave differently than the last program?

_____

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Name_____

Lesson 5: Worksheet 5.3 – Play a tune

In this activity, you need to write a program to make Edison play a musical tune.

You can get Edison to play a tune using the Ed.PlayTune() function and a special type of input called a 'string.'

Using a string to play a tune

In Python, a 'string' is a list of characters in order. A 'character' is anything you can type on the keyboard like a letter, a number, or a special character like $ or #. For example, 'Meet Edison' is a string, 11 characters long (10 letters and 1 space).

In the EdPy app, we need to use a string to play a musical tune. We call this a 'tune string.'

Tune strings are a special string of characters that represent particular tunes. Tune strings are made up of notes and duration inputs, which are represented by single characters.

A tune string looks like this: "ndndndndnd…ndz" where n is a note from the notes table and d is duration from the duration table:

Notes Table

String character	Plays musical note
m	low A
M	low A sharp
n	low B
c	C
C	C sharp
d	D
D	D sharp
e	E
f	F
F	F sharp
g	G
G	G sharp
a	A
A	A sharp
b	B
o	high C
R	rest
z	end of tune

Duration Table

String character	Plays
1	whole note
2	half note
4	quarter note
8	eighth note
6	sixteenth note

All tune strings must end with the 'z' character to end correctly.

To create a tune string, you need to call the function Ed.TuneString(), which has two input parameters. The size of the string (in other words, the number of characters in the string) is the first parameter, and the actual string you want to play is the second parameter.

You can change the speed your tune plays by changing the Ed.Tempo variable in the Setup code.

Name_____

Your turn:

Write the following code to play the tune 'Mary Had a Little Lamb':

```
#-------------Setup----------------

import Ed

Ed.EdisonVersion = Ed.V2

Ed.DistanceUnits = Ed.CM
Ed.Tempo = Ed.TEMPO_MEDIUM

#--------Your code below-----------
maryLamb = Ed.TuneString(53,"e4d4c4d4e4e4e2d4d4d2e4g4g4e4d4c4d4e4e4e4e4d4d4e4d4c1z")

Ed.PlayTune(maryLamb)
while Ed.ReadMusicEnd() == Ed.MUSIC_NOT_FINISHED:
    pass

```

This is the tune string in the program:

"e4d4c4d4e4e4e2d4d4d2e4g4g4e4d4c4d4e4e4e4e4d4d4e4d4c1z"

Experiment with changing the Ed.Tempo value in the Setup code.

1. What are the different values that Ed.Tempo can take?

Hint: Remember you can use the autocomplete feature in the EdPy. Try typing 'Ed.TEMPO' and see all the possible values for Ed.TEMPO the autocomplete brings up.

_____

_____

2. Which Ed.TEMPO value will make the tune play the fastest?

_____

3. Modify your program to only play some part of the tune. Describe the changes you had to make to your program to only play a part of the tune.

_____

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