

## Activity: Using MATLAB to visualize sounds

Draw how a sound wave looks with a lot of noise

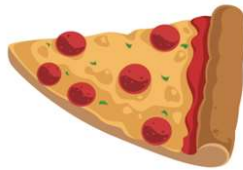
Draw how a sound wave looks with no noise

### NOTES:

## Activity: Calculations in MATLAB



Fries = \$3



Pizza = \$3



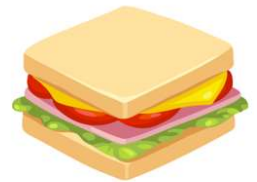
Ice cream = \$4



Chips = \$2



Soda = \$2



Sandwich = \$4

Calculate each person's cost on paper and then in MATLAB:

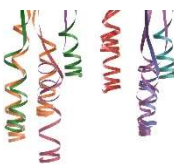
Name	Order	Total Price (by Hand)	MATLAB
Hulk	1 sandwich, 2 sodas	$1 \times 4\$ + 2 \times 2\$$ $= 4\$ + 4\$$ $= 8\$$	>> 1*4 + 2*2
(student 1 name)			>>
(student 2 name)			>>
TOTAL		$8 + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$	>>

Go back and change the price of soda to \$1 in your calculations.

Activity: Party Planning – Shopping List



Item	Balloons	Party Hats	Party Blowers	Masks	Cups
Paradise(\$)	5	6	5	2	3
Utopia (\$)	4	8	3	2	4



Item	Party Streamers	Plates	Napkins	Cutlery	Cake
Paradise(\$)	3	5	3	5	8
Utopia(\$)	3	7	2	6	9

Add 3 more items to your shopping list table:

	Balloons	Party Hats			
Items	"balloons"	"hats"			
Paradise Prices	5	6			
Utopia Prices	4	8			

## Activity: Playing Happy Birthday Song

### Use MATLAB to play the Happy Birthday Song

#### Notes to the Birthday Song

**G4 G4 A4 G4 C5 B4**  
 Happy birthday to you  
  
**G4 G4 A4 G4 D5 C5**  
 Happy birthday to you  
  
**G4 G4 G5 E5 C5 B4 A4**  
 Happy birthday dear <Name>  
  
**F5 F5 E5 C5 D5 C5**  
 Happy birthday to you

#### Frequencies to the Birthday Song

392 392 440  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

#### Conversion Table:

Reference this web site for a table that provides notes and frequencies

[seventhstring.com/resources/notefrequencies.html](http://seventhstring.com/resources/notefrequencies.html)

### Come up with your own tune!

#### Notes to my song:

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#### Frequencies to my song:

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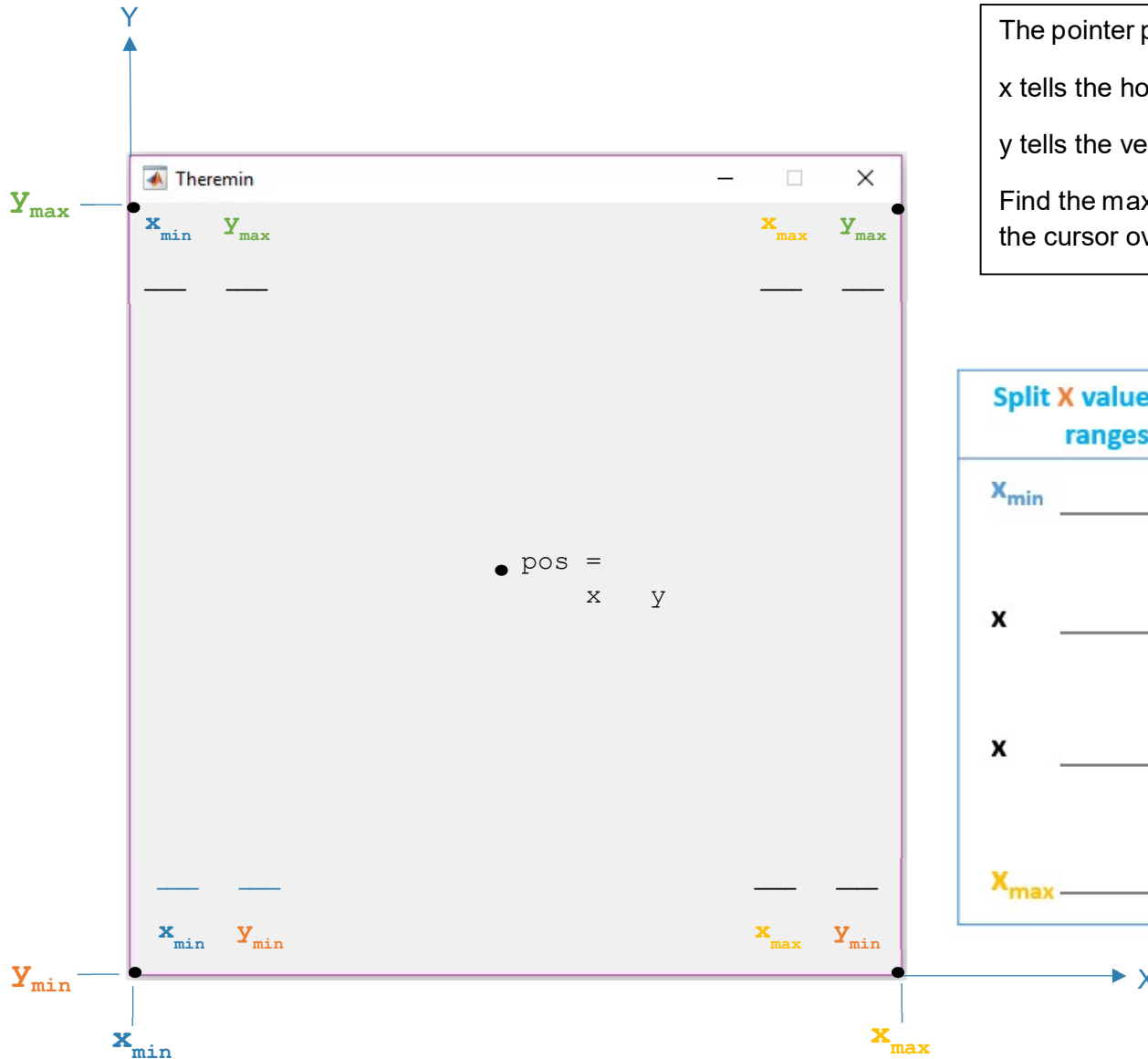
Activity: Keyboard Piano

Key	a	s	d	f	g	h	j	k
Sound (frequency)	C4 261.6	D4	E4	F4	G4	A4	B4	C5

Key								
Sound								

Key								
Sound								

## Activity: Virtual Theremin



The pointer position is denoted by two numbers – x , y

x tells the horizontal location

y tells the vertical location

Find the maximum and minimum values of x and y by moving the cursor over corner points.

Split X values into ranges	Pick a sound for each range	What do we do in each range?
$x_{min}$ _____	_____	If X is between _____ and _____ , Play _____
<b>X</b> _____	_____	If X is between _____ and _____ , Play _____
<b>X</b> _____	_____	If X is between _____ and _____ , Play _____
$x_{max}$ _____	_____	If X is between _____ and _____ , Play _____

## Activity: Customizing the theremin

How can we make the frequency and amplitude dependent of x and y (horizontal and vertical pointer locations)?

	<i>x</i>	<i>operation</i>	<i>number</i>	<i>freq (Hz)</i>
<i>Min</i>	1	*	_____	_____
<i>Max</i>	500		_____	2000

**Code:**

freq = x \* \_\_\_\_\_

	<i>y</i>	<i>operation</i>	<i>number</i>	<i>amp</i>
<i>Min</i>	1	/	_____	_____
<i>Max</i>	500		_____	1

**Code:**

amp = y / \_\_\_\_\_

## Activity: Creating a melody

We are going to create the melody below:

Timing	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cabasa	C	C	C	C	C	C	C	X	C	C	C	C	C	C	C	X
Guitar	G3	G3	D3	D3	E4	F4	G4	E4	D3	C3	C3	B3	B3	A3	A3	G3
Tambourine	T	X	T	X	T	X	T	X	T	X	T	X	T	X	T	X

## Activity: Creating a melody of your own

Create your own melody here:

Timing	1	2	3	4	5	6	7	8	9	10

Give a name to your melody: \_\_\_\_\_

Timing	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Give a name to your melody: \_\_\_\_\_