MATLAB – HW7 Upload Date: 13 Dec. 2020

Dorreen Rostami – 97243034
Zahra Hashemi – 97243072

7-1) DTMF works by assigning eight different audio frequencies to the rows and columns of the keypad. The columns on the keypad are assigned high-frequency signals, while the rows are assigned low-frequency signals.

		High-Group Frequencies			
		1209Hz	1336Hz	1477Hz	1633Hz
Low-Group Frequencies	697Hz	1	ABC 2	DEF 3	A
	770Hz	GHI 4	JKL 5	MNO 6	B
	852Hz	PRS 7	TUV 8	WXY 9	C
	941Hz	*	OPER 0	#	D

The DTMF keypad

Source : https://www.onsip.com/voip-resources/voip-fundamentals/dtmf-tones-and-signaling-explained#:~:text=DTMF%20works%20by%20assigning%20eight,and%20columns%20of%20the%20keypad.&text=When%20you%20press%20a%20key,of%20the%20row%20it's%20in.

7-2) Using the frequency of note A in Octave 0 (55.0 Hz) we can compute the frequency of the input, given the notes and their octaves.

Notes	Frequency (octaves)				
A	55.00	110.00	220.00	440.00	880.00
A#	58.27	116.54	233.08	466.16	932.32
B	61.74	123.48	246.96	493.92	987.84
C	65.41	130.82	261.64	523.28	1046.56
C#	69.30	138.60	277.20	554.40	1108.80
D	73.42	146.84	293.68	587.36	1174.72
D#	77.78	155.56	311.12	622.24	1244.48
E	82.41	164.82	329.64	659.28	1318.56
F	87.31	174.62	349.24	698.48	1396.96
F#	92.50	185.00	370.00	740.00	1480.00
G	98.00	196.00	392.00	784.00	1568.00
A♭	103.83	207.66	415.32	830.64	1661.28

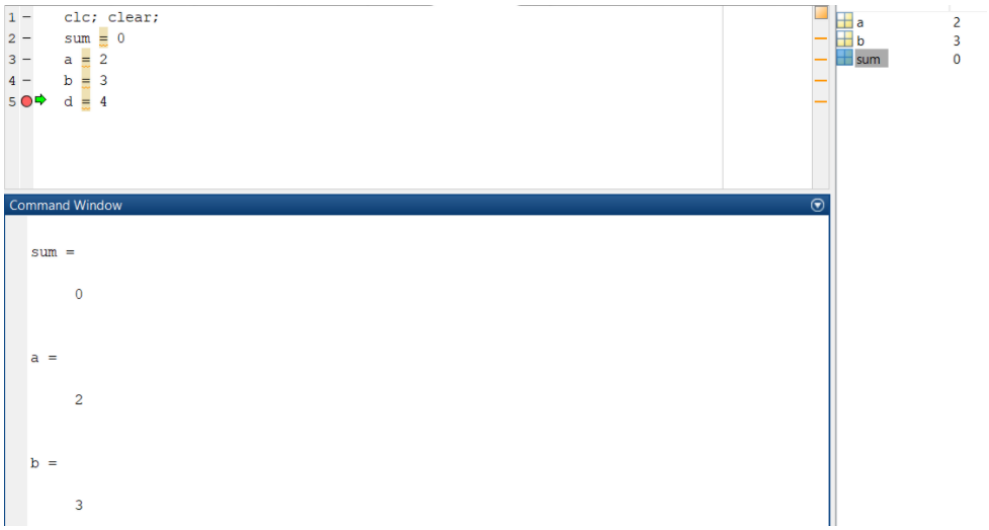
Source : http://techlib.com/reference/musical_note_frequencies.htm

- Note that A♭ is G# (we can easily confirm this by looking at a guitar fretboard)

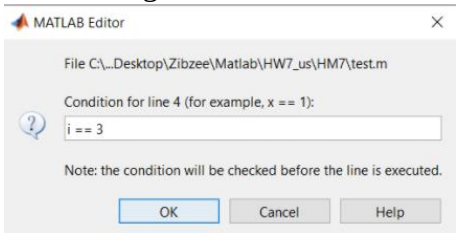
7-3) Debugging in MATLAB using breakpoints:

You can set breakpoints only at executable lines in saved files that are in the current folder or in folders on the search path. You can set breakpoints at any time, whether MATLAB is idle or busy running a file. There are 3 main types of breakpoints:

- Standard Breakpoint: pauses at the specified line.



- Conditional Breakpoint: pauses when given condition is met.



- Error Breakpoint: pauses when the selected error occurs.