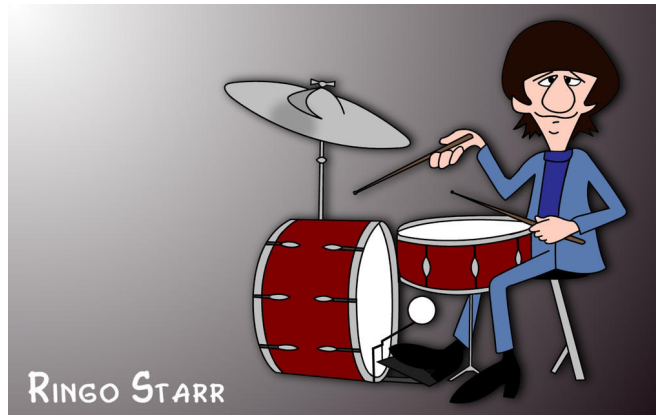


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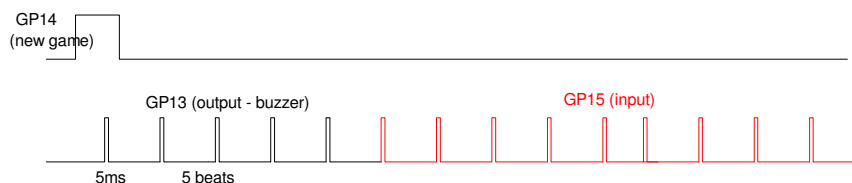
Edge Interrupts, Timer Interrupts

Drummer Trainer

One of the hallmarks of Ringo Starr was that he was very good at maintaining a beat throughout a song. Are you?



Write a python program that generates a random tempo from 40 to 80 beats-per-minute (bpm) and then has you maintain that tempo.



Drummer Trainer	
BPM	57
# Beats	6
Error	-13ms
Mean	4.3ms
St Dev	7.6ms

Specifically

- When the program starts, a random number in the range of 40 to 80 is generated.
- The Pico will then output five beats at that tempo
- The user is then to continue playing that tempo for another ten beats by pressing button GP15
- Each time you press GP15, the error in your tempo (in milliseconds) is displayed
- As you go along, the LCD displays
 - The target beats per minute
 - The beat number (increase by one each time you press GP15),
 - The error in your current beat in ms
 - The mean error since the start of this round
 - The standard deviation of your error in this round

- A new game is triggered by pressing GP14 (new random tempo, clear variables)

The goal is to make the mean and standard deviation of the error as small as possible,

Grading

- 10pt A random tempo is generated and displayed on the LCD in the range of 40 to 80 bmp
- 10pt Periodic timer interrupts play five beats at this tempo
- 10pt One-shot timer interrupts set the duration of the buzzer to 5ms (you can change this)
- 10pt After five beats, edge interrupts are triggered each time you press GP15
- 10pt The LCD displays the total number of beats you've done (GP15 presses)
- 10pt The LCD displays the error, mean error, and standard deviation of the error
- 10pt Edge interrupts start a new game on pressing GP14
- 10pt Demonstrate your Drummer Trainer