Project 0 : “Flicker fusion threshold” – Task Description

“The flicker fusion threshold (or flicker fusion rate) is a concept in the psychophysics of vision. It is defined as the frequency at which an intermittent light stimulus appears to be completely steady to the average human observer.”

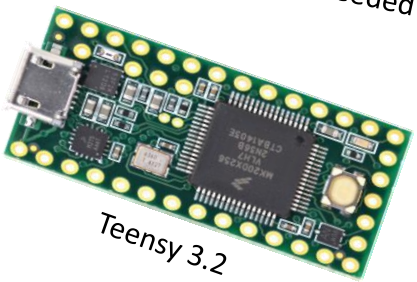
Flicker fusion threshold - Wikipedia. (n.d.). Retrieved March 15, 2017, from https://www.wikipedia.com/en/Flicker_fusion_threshold

Your Task:

Set up a prototype of an Embedded System for the measurement of a person’s subjective flicker fusion threshold. A flashing LED(50% duty cycle) should serve as the visual stimulus.
A potentiometer should be used to allow for the adjustment of the LED’s blink frequency.
A button should be part of the system.
If pressed a hardware interrupt should be triggered and the currently set blink frequency should be displayed in a serial monitor on a connected PC .

Use the pictured components to build the described Embedded Systems.

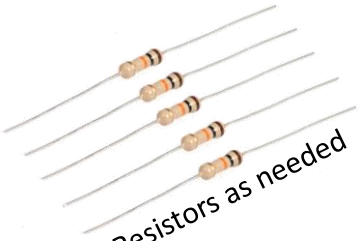
Buttons as needed



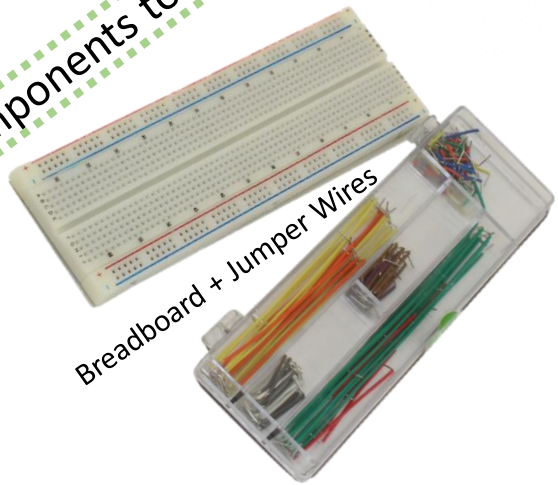
Teensy 3.2

LEDs as needed

10 kΩ Potentiometer



Resistors as needed



Breadboard + Jumper Wires

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RULES

REQUIRED PROJECT OUTPUT

RULES:

- No *delay()* function -- *millis()* , *micros()* are valid alternatives
- Use of an external interrupt for the button
- Debouncing of the button
- The frequency output in the serial monitor must be verified by means of an output signal measurement using an oscilloscope

Questions:
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This Projects accounts for 10% of your overall course mark.

REQUIRED PROJECT OUTPUT:

- Working hardware prototype
- Video of yourself explaining the operation of your system (YouTube ?)
- A brief project report (as a **README.md** file on github) including
  - General project description (purpose, …)
  - Description of your design process steps
  - Schematic (e.g. EasyEDA, Eagle, KiCad, ...) + Why and how did you select relevant components and their values ?
  - Source Code (well commented as a repo on **github**)
  - Picture of the oscilloscope output and the serial monitor output
  - Limitations of your project + possible future improvements
  - Appendix with relevant datasheets
  - Use of proper APA referencing if applicable

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