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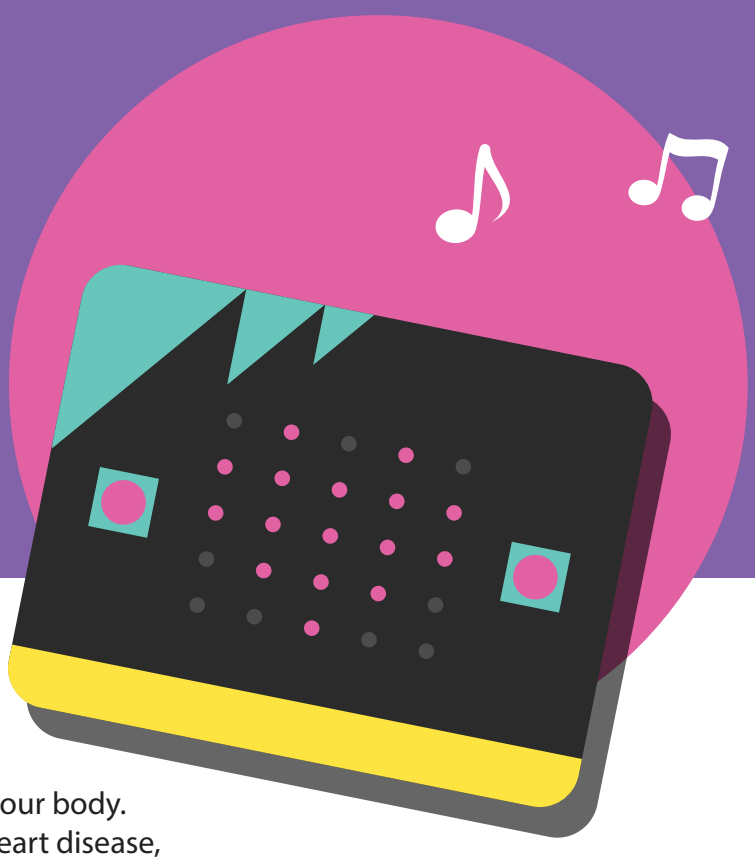
micro-bit Musical Fitness Tracker



PROBLEM STATEMENT:

Regular physical exercise is critical to ones health. Going just two weeks without regular exercise can cause serious muscular and metabolic changes to your body. These changes can increase ones risk of diabetes, heart disease, high blood pressure, and even depression.
The goal is to help combat these risks with an interactive device that promotes regular physical movement. The constraint to this goal, however, is usability. The device has to be simple and easy to use as to not add further obstacles for the user to complete their exercise.

DESIGN:

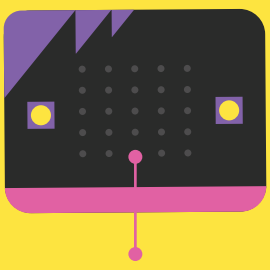
Solution One:
A device which records and times exercise sessions to allow users to monitor their physical exercise.

Solution Two:
A step counter that records distance travelled, sets goals, and promotes an easy form of regular exercise.

Chosen Solution: Solution Two

Solution Two seemed like the most promising solution to the problem, as it promoted a simple and easy form of exercise which would be accessible to most people, and easy to incorporate into a regular routine. Users could wear it all day wherever they go, and it would support them in achieving their step goals while being mindful about how they get around during the day - perhaps more destinations are walkable than originally anticipated!

PROTOTYPE:



LED Display

The LED display will be used to provide the user with a visual indicator of their progress. The LEDs will read their step count, unless a change is made to the step goal, in which case the step goal will be displayed.

Button Inputs

Button inputs A and B will be used to set metrics on the fitness tracker. One will allow the user to set and increase their step goal, and the other will reset the device.

Shaking Sensor

The built in shaking sensor on the micro-bit will be used to detect steps as the user walks. Each up and down motion will trigger a counter variable to increase.

Audio / Visual Output

To signal the user that they have completed their goal, as well as to provide a cheery congratulations, upon completion of the step goal the micro-bit will display a heart and play an uplifting musical tune. For motivation along the way, the device will also charm when the user reaches the half-way point to their goal.

See Prototype: https://makecode.microbit.org/_hehKd7FEbbkK

Instructions:

1. Turn on the fitness tracker to view your step count on the display. This will always reset at 0.
2. Press the B button to set a step goal. Each time the B button is pressed the step goal will increase by 1000 steps.
3. Press the A & B buttons to reset the tracker. This will reset the step count and step goal to 0.

4. Set your goal and place your tracker in your pocket. Go about your day and wait until you hear your audio signal that you've achieved your goal!

FUTURE:

Currently, the fitness tracker is simply a battery-operated micro-bit. In the future, it could be enhanced by being embedded into various forms of atheletic accessories, like wristbands or water bottle pouches for example. Making every day objects that already facilitate a healthy active lifestyle interactive with the micro-bit fitness tracker could further solve the problem statement and encourage more users to be active.

In creating this project I hoped to not only tackle the problem statement of encouraging more people to fit regular physical exercise into their daily routines, but to do so in a creative way. I think the Musical Fitness Tracker achieved these goals by implementing a simple system that allows users to track their steps, while encouraging them along the way with whimsical musical reminders.

REFERENCES:

- https://www.mayoclinic.org/healthy-lifestyle/fitness/in-depth/10000-steps/art-20317391

- https://www.hopkinsmedicine.org/health/conditions-and-diseases/diabetes/diabetes-and-high-blood-pressure

- https://www.health.com/condition/type-2-diabetes/two-weeks-sedentary-raise-diabetes-risk