Self-Balancing Dancing Segway
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Access to video and pictures:

https://drive.google.com/drive/folders/1i2_h7K0nHX6o55lKXWxxARlcaVrOX2x7?usp=sharing

Brief summary of files and content:

Challenge1.py	Utilise built-in microphone to develop a beat detection code • Combine beat detection with loudness • Light up LEDs synchronised with music
Challenge2.py	Control speed and direction of motors using IMU • Control speed and direction with potentiometer • Combine with ability to derive pitch and roll angles from IMU measurements • Display each motor on OLED display
Challenge3.py	Implement PID controller for speed of motors • Demonstrate PID control algorithm is functioning • Apply pressure to increase friction (video)
Challenge4.py	Dancing Segway (w/o balancing) • Attach stabalisers to Segway • Develop dancing code with combination of beat detection from Challenge1.py
Challenge4Moves.py	Dance choreography file
Challenge5.py	Self-balancing the Segway • Implement a PID algorithm using the pitch angle as the set-pont variable and control the motors to maintain the pitch angle to be zero (post-calibration)
Challenge5PID.py	PID controller for challenge 5
Challenge5Motor.py	Motor function for challenge 5
Challenges.pdf	• Brief for each challenges and criteria

We use the following standard modules:

- boot.py
- drive.py
- font.py
- main.py
- mic.py
- motor.py
- mpu6050.py
- oled_938.py
- pybench.py
- user.py