Github URL:
https://github.com/shreyan-collab/PES-FINAL-PROJECT.git

Video URL:
https://drive.google.com/drive/folders/1OXiwXq0vsnInMMWZApwPhWgTRiT4M86i?usp=sharing

If you cannot view the file, try to download
If you are getting the following error, enable third party cookies for google drive

Try these steps

1. On your computer, open Chrome.
2. At the top right, click More. Settings.
3. Click Privacy and security. Cookies and other site data.
4. Select an option: Allow all cookies. Block all cookies (not recommended). Block third-party cookies in Incognito. Block third-party cookies.

My final project is to measure a digital gauge meter.

Features of digital gauge (specifics not mentioned in the proposal):

1) The digital gauge meter can measure angles from 0 -180 degrees.
2) The user is also having a provision to software calibration of zero references from 0 - 90 degrees with respect to which he can calculate the angle.
3) I am using the rolling reading to measure the angle from the accelerometer

In our application, the user can calibrate or have reference zero only from 0 - 90 degrees beyond the user is not having a provision to give zero references because the angle with which he can measure will become less as we can measure only from 0 to 180 degree. This is the reason we are giving zero references from 0 - 90 degrees.

The project consists of the following segments

1)Testing
2)Command processor

- Calibrate - to calibrate a zero reference or actual zero as the starting point for measuring the angle
- Set an angle - To measure an angle from the calibrated offset
- Using PWM to indicate how close or far the user is from the destination/ final angle
- Through roll command, the user can get the current roll value
- Through the info command, the user can see all the possible commands and their syntax
- Through author command, the user
- The command processor also handles backspace, case insensitiveness, wrong syntax

Additional feature implemented

I have implemented an additional feature that will the user visual feedback on how close or how far he is from the destination angle. I have not included it in the proposal we submitted earlier. As the user is far away from the destination angle, it transitions from GREEN to BLUE. As the user is close to the destination angle, it transitions from GREEN to RED.

All the features which have been mentioned in the proposal have been implemented.

Screenshots of working:

The peripheral switch, LED's, I2c transactions, and accelerometer readings are checked. In this case, the user didn't press the button and didn't move the accelerometer to any angle within 5 seconds. Either it can mean, the peripheral is not working/ timeout is reached

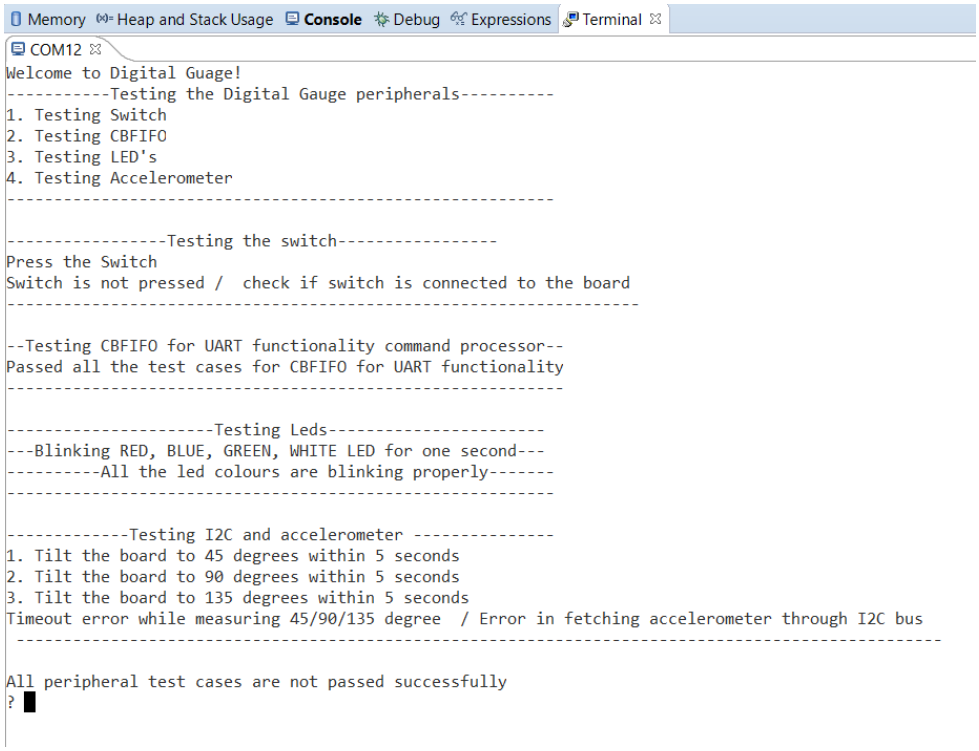

Fig 1: Unhappy case

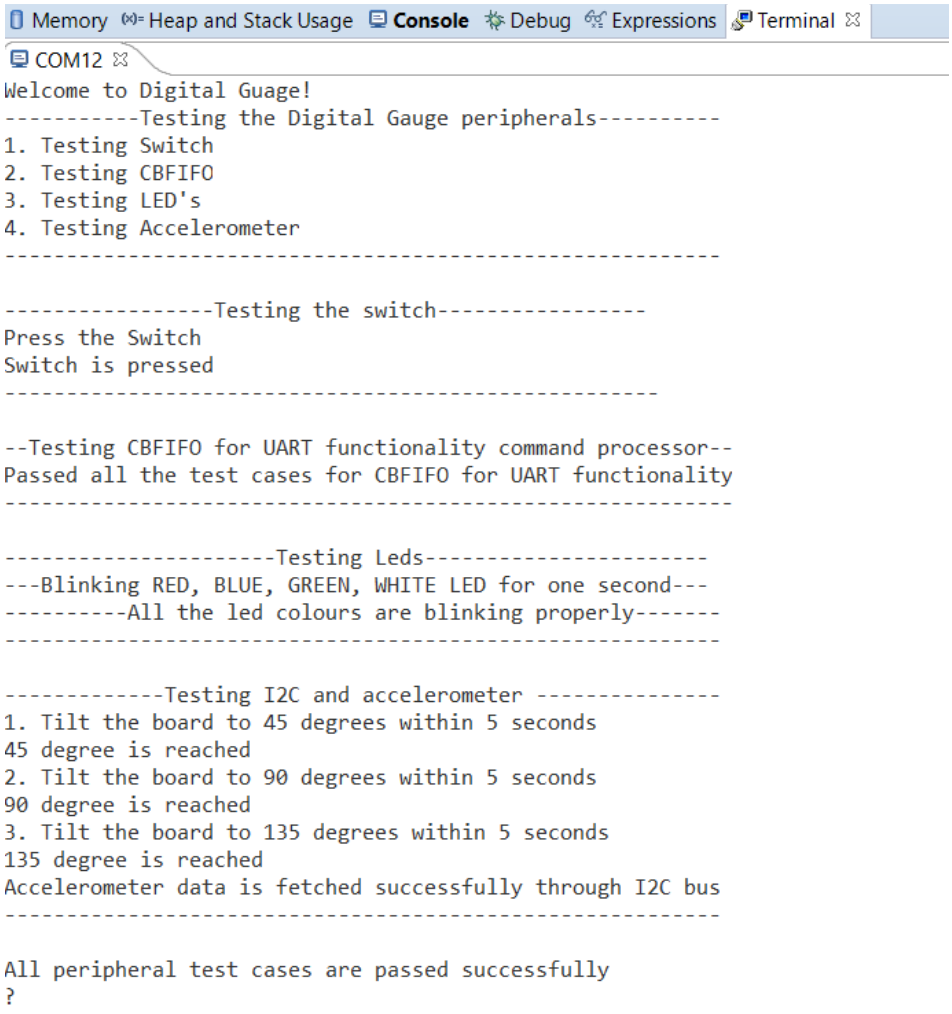

Fig 2: Happy Case

In our application, the user can calibrate or have reference zero only from 0 - 90 degrees beyond user is not having a provision to give zero references because the angle with which he can measure will become less. This is the reason we are giving zero references from 0 - 90 degree.

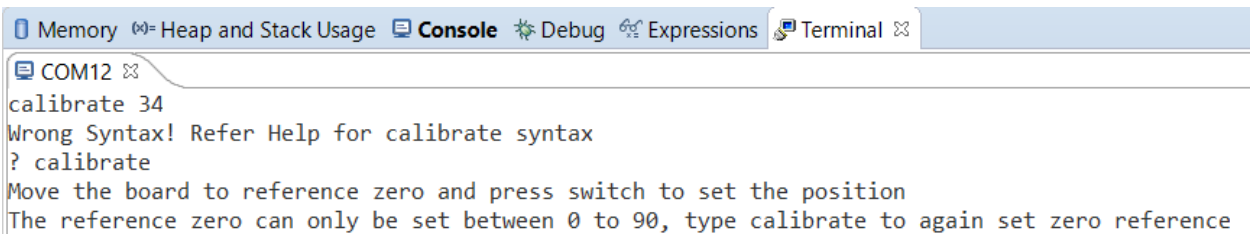

Fig 3: Calibrate Unhappy case

In this screenshot Fig 4, the user is only giving 50 degrees as zero reference value which is a valid case. He can set a maximum angle of 130 degrees beyond which he gives, our command processor will throw a warning message. The experiment is also carried out flat surface where reference is zero.

```
? calibrate
Move the board to reference zero and press switch to set the position

Switch is pressed, Reference zero angle is set as 44, Use this to measure the angle you require

With this zero reference , you can measure up to 136
? set 150
The maximum angle that can be measured is 136
? set 50
Input angle given as 50, Move the accelerometer to the desired angle
Desired angle is reached
Type calibrate if you want to set reference position before measuring another angle
Current Reference Angle = 0
? set 100
Input angle given as 100, Move the accelerometer to the desired angle
Desired angle is reached
Type calibrate if you want to set reference position before measuring another angle
Current Reference Angle = 0
```

Fig 4: Calibrate Happy case and set angle screenshots

Fig 5 consists of the additional commands of the command processor such as if user types info, it will print the current roll angle

```
? help
1. Type <Author>(case insensitive) to know the author's name
2. Type <calibrate> to set a reference position as 0 with respect to which angle wll be measured
3. Type <help>(case insensitive) to know about the possible commands
4. Type <info>(case insensitive) to know about the build information
5. Type <set> followed by <angle> to measure angle with respect to the reference position you have given
? info
Current Roll Angle: 0
? author
Shreyan
?
```

Fig 5: Other helper commands