Code (Android App for HAR)

- Results

Every Activity has a type and will be detected by this terminology: -

1. IN_VEHICLE (If the device is in moving Vehicle)
2. ON_BICYCLE
3. ON_FOOT
4. STILL
5. TILTING
6. UNKNOWN (This is shown when users activity is not detected / recognised)
7. WALKING (This is sub type of ON_FOOT)
8. RUNNING (This is sub type of ON_FOOT)
9. INVALID (used for parsing errors)

A number ranging from 0 – 100 is shown which is the accuracy / confidence level.

Human Activity Recognition

Activity	Confidence	Timestamp
STILL	93	2021-12-06 10:23:13
TILTING	100	2021-12-06 10:23:13
STILL	91	2021-12-06 10:23:08
STILL	86	2021-12-06 10:23:03
STILL	97	2021-12-06 10:22:58
STILL	99	2021-12-06 10:22:53
STILL	100	2021-12-06 10:22:47
STILL	99	2021-12-06 10:22:44
STILL	99	2021-12-06 10:22:44
STILL	99	2021-12-06 10:22:42
STILL	97	2021-12-06 10:22:39
STILL	99	2021-12-06 10:22:34
UNKNOWN	40	2021-12-06 10:22:32

Working of
App.mp4

10. To Download the files for the App, go to: -

   https://drive.google.com/drive/folders/1dz7zBkJviUxgHTWGfUcb2KEyTu-

   CoiiC?usp=sharing

Code (TensorFlow for HAR with LSTM)

- Results
  1. The Bar Graph represents a chart between Number of Users & Activity type.

  2. The Line graph represents Activity and axis (Based on accelerometer): - Standing, Walking, Sitting, Jogging.

Standing

3. Model contains 2 LSTM Layers stacked on each other and then the data is trained up to 50 epochs and hence we observe the test accuracy increase from 0.77 to 0.94 and loss decreasing from 1.27 to 0.25

```
epoch: 1 test accuracy: 0.7992897033691406 loss: 1.3222434520721436
epoch: 10 test accuracy: 0.914488673210144 loss: 0.678021252155304
epoch: 20 test accuracy: 0.9447227120399475 loss: 0.4672027826309204
epoch: 30 test accuracy: 0.9647573232650757 loss: 0.33668482303619385
epoch: 40 test accuracy: 0.9653947949409485 loss: 0.2878262996673584
epoch: 50 test accuracy: 0.9695838093757629 loss: 0.2508734166622162

final results: accuracy: 0.9695838093757629 loss: 0.2508734166622162
```

4. At last, we plot the graph between Training Accuracy and Loss and also Test Accuracy and loss and observe the deviations. Our model seems to learn well with accuracy reaching above 97% and loss hovering at around 0.2.
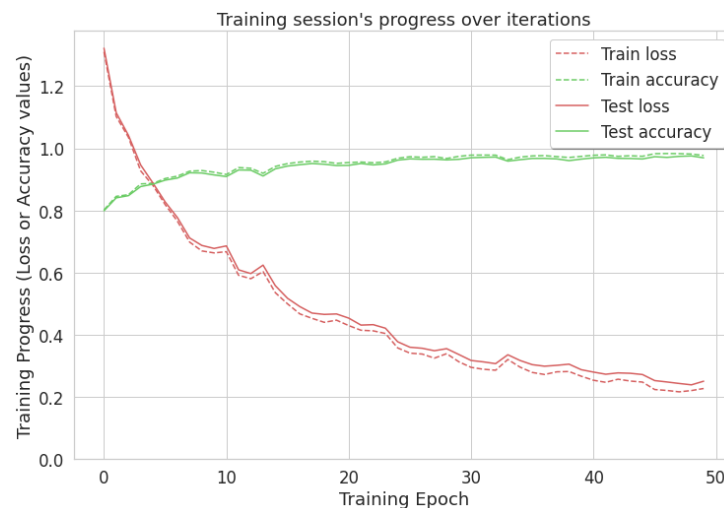
5. A confusion matrix is made between activities predicted and true.

Confusion matrix