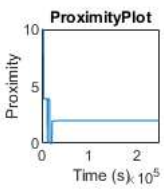
Contents

- Import data from spreadsheet
- verifying the data
- Gyroscope
- Set up the Import Options and import the data
- Create output variable
- Create table
- Allocate imported array to column variable names
- Clear temporary variables
- Speed Calculation
- Gravity Variations in a Lift
- Import the data
- Light Sensor
- Accelerometer
- Import data from text file
- Set up the Import Options and import the data
- Convert to output type
- Import the data
- Create output variable
- Create table
- Allocate imported array to column variable names
- Clear temporary variables
- Functions

Import data from spreadsheet

```
%read the data required from whole data sheet
%proximity data taken to a
Data_Set=xlsread ('Team_1_Data_Set.xlsx');
[prox_0] = Data_Set(:,30);
[prox_1] = Data_Set(:,20);
% plotting the value of proximity sensor against time
%plot the graph
subplot(3,4,9);
plot(prox_0,prox_1);
xlabel("Time (s)");
ylabel("Proximity");
title("ProximityPlot");
```



verifying the data

```
disp('put any obstacle near phone')
b=1;
for loop = 1:30
    if (prox_1(b)==0)
        disp(prox_1(b))
        disp('obstacle find within 5CM')
        b = b+1;
    elseif (prox_1(b)>0 && prox_1(b)<=10)
        disp(prox_1(b))
        disp('obstacle find within 10CM')
        b = b+1;
    else
        disp(prox_1(b))
        disp('safe, no obstacle')
        b = b+1;
```

```
    end
end
```

```
put any obstacle near phone
    10

obstacle find within 10CM
    10

obstacle find within 10CM
    10

obstacle find within 10CM
    10

obstacle find within 10CM
    10

obstacle find within 10CM
    10

obstacle find within 10CM
    10

obstacle find within 10CM
    10

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
     0

obstacle find within 5CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
    3.9000

obstacle find within 10CM
```

Gyroscope

Import data from text file Script for importing data from the following text file:

```
filename: D:\Akshay_Files\androsensor.csv
```

Auto-generated by MATLAB on 20-Dec-2020 14:29:29

Set up the Import Options and import the data

```
opts = delimitedTextImportOptions("NumVariables", 31);

% Specify range and delimiter
opts.DataLines = [1, Inf];
opts.Delimiter = ";";

% Specify column names and types
opts.VariableNames = ["ACCELEROMETERXms", "ACCELEROMETERYms", "ACCELEROMETERZms", "GRAVITYXms", "GRAVITYYms", "GRAVITYZms", "LINEARACCELERATIONXms", "LINEARACC
opts.VariableTypes = ["double", "double", "double", "double", "double", "double", "double", "double", "double", "double", "double", "double", "double", "double", "double

% Specify file level properties
opts.ExtraColumnsRule = "ignore";
opts.EmptyLineRule = "read";
opts.ConsecutiveDelimitersRule = "join";

% Specify variable properties
opts = setvaropts(opts, ["LOCATIONLatitude", "LOCATIONLongitude", "LOCATIONAltitudeM", "LOCATIONSpeedKmh", "LOCATIONAccuracyM", "LOCATIONORIENTATION", "YYYYMOD
opts = setvaropts(opts, ["LOCATIONLatitude", "LOCATIONLongitude", "LOCATIONAltitudeM", "LOCATIONSpeedKmh", "LOCATIONAccuracyM", "LOCATIONORIENTATION", "Satell

% Import the data
x_read = xlsread('Team_1_Data_Set.xlsx','J2:J98');
timems = xlsread('Team_1_Data_Set.xlsx','AD2:AD98');
gyro_x = [x_read,timems];
```

Create output variable

```
data = gyro_x;
```

Create table

```
stepdata = table;
```

Allocate imported array to column variable names

```
stepdata.GYROSCOPEXrads = data(:,1);
stepdata.TimeSinceStartInMs = data(:,2);
```

Clear temporary variables

```
clearvars gyro_x x_read timems R;

%data=x_read;
stepdata=table;
stepdata1=table;
%data1=timems;
stepdata.gyroscope=data(:,1);
stepdata.time=data(:,2);
values=numel(data(:,1));
p=[];
cnt=0;
cnt1=0;
for i=1:values
    j=j+1;
    if(stepdata.gyroscope(i,1)>0)
        cnt=cnt+1;
        stem(stepdata.gyroscope(i,1));
        disp("The phone is  being using");
    else
        cnt1=cnt1+1;
        disp("The phone is not being used");
    end
    disp("The number of times the phone is being used is ");
    disp(cnt);
    disp("The number of times the phone is not being used is ");
    disp("cnt1");
end
subplot(3,4,12);
plot(stepdata.time,stepdata.gyroscope);
title("Gyroscope Data");
xlabel("Time (ms)");
ylabel("Radians per sec");
```

```
The phone is not being used
The number of times the phone is being used is
     0

The number of times the phone is not being used is
cnt1
The phone is not being used
```

```
The number of times the phone is being used is
     0

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
     0

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
     0

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
     1

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
     2

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
     3

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
     3

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
     3

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
     3

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
     3

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
     4

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
     5

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
     5

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
     5

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
     5

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
     5

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
     6
```

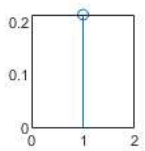
```
The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
     7

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
     8

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
     9

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
     9

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
     9

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    10

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    11

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    12

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    13

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    14

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    15

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    16

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    17

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    18

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    19

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    20

The number of times the phone is not being used is
```

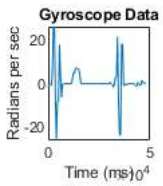
```
cnt1
The phone is  being using
The number of times the phone is being used is
    21

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    22

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    22

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    22

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    22

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    23

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    23

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    23

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    23

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    23

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    23

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    24

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    24

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    25

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    26

The number of times the phone is not being used is
cnt1
The phone is not being used
```

```
The number of times the phone is being used is
    26

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    26

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    27

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    28

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    29

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    30

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    30

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    30

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    30

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    30

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    30

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    31

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    31

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    31

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    31

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    31

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    32
```

```
The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    33

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    34

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    34

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    34

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    34

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    35

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    36

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    36

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    36

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    37

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    37

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    37

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    37

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    38

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    39

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    40

The number of times the phone is not being used is
```

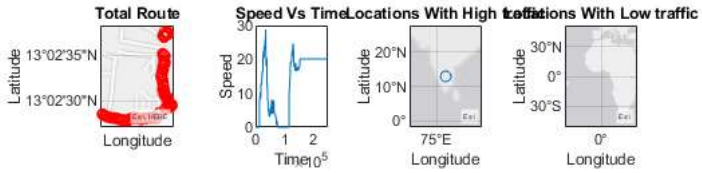
```
cnt1
The phone is  being using
The number of times the phone is being used is
    41

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    41

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    41

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    41

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    41

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    42

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    42

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    42

The number of times the phone is not being used is
cnt1
The phone is not being used
The number of times the phone is being used is
    42

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    43

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    44

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    45

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    46

The number of times the phone is not being used is
cnt1
The phone is  being using
The number of times the phone is being used is
    47

The number of times the phone is not being used is
cnt1
```

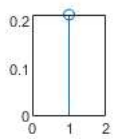


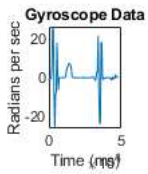


Speed Calculation

```
[Latitude] = Data_Set(:,22);
[Longitude] = Data_Set(:,23);
[Speed] = Data_Set(:,26);
[Time] = Data_Set(:,30);

Lat1 = [];
Long1 = [];
Lat2 = [];
Long2 = [];
Lat3 = [];
Long3 = [];

[a, speedLength]=size(Speed);

for i = 1:speedLength
    if Speed(i) < 10
        [Lat1] = [Lat1;Latitude(i)];
        [Long1] = [Long1;Longitude(i)];
    elseif Speed(i)>=10 && Speed(i)<30
        [Lat2] = [Lat2;Latitude(i)];
        [Long2] = [Long2;Longitude(i)];
    else
        [Lat3] = [Lat3;Latitude(i)];
        [Long3] = [Long3;Longitude(i)];
    end
end
%subplot(2,2,2);

%title('Locations With High traffic');
%xlabel('Latitude');
%ylabel('Longitude');
subplot(3,4,1);
geoscatter(Latitude,Longitude,'r');
title('Total Route');
subplot(3,4,2);
geoscatter(Lat1,Long1);
plot(Time,Speed);
title('Speed Vs Time');
xlabel('Time');
ylabel('Speed');
subplot(3,4,3);
geoscatter(Lat1,Long1,'o');
title('Locations With High traffic');
subplot(3,4,4);
geoscatter(Lat2,Long2,'k');
title('Locations With Low traffic');
```







Gravity Variations in a Lift

Import data from spreadsheet Script for importing data from the following spreadsheet:

```
Workbook: E:\LTTS\Matlab Intermediate\step_data.xlsx
Worksheet: in
```

To extend the code for use with different selected data or a different spreadsheet, generate a function instead of a script.

Import the data

```
Gravity = Data_Set(:,6);%importing Gravity values
[Time]= Data_Set(:,30); %importing data on time
subplot(3,4,5);
plot(Time,Gravity,'r:'); %plotting Gravity i z axis against time
xlabel('Time (s)');
ylabel('Gravity (m/s^2)');
title('Gravity Variations in Lift')
% Understanding the logic
for index =1:100
    if(Gravity(index) > Gravity(index+1))
        disp("The lift is moving up.")
    elseif(Gravity(index)<Gravity(index+1))
        disp("The lift is moving down.")
    elseif(Gravity(index)==Gravity(index+1))
        disp("The lift isn't moving.")
    end
end
% Lift Display on application level
for index =1:100
    if(Gravity(index) > Gravity(index+1))
        disp("You are heading towards higher floors.")
    elseif(Gravity(index)<Gravity(index+1))
        disp("You are heading towards lower floors.")
    elseif(Gravity(index)==Gravity(index+1))
        disp("Please close the lift to move further")
    end
end
```

```
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving down.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving down.
The lift is moving down.
The lift is moving down.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving down.
The lift is moving up.
The lift is moving up.
The lift is moving up.
```

```
The lift is moving down.
The lift is moving up.
The lift is moving up.
The lift is moving up.
The lift is moving down.
The lift is moving up.
The lift is moving down.
The lift is moving down.
The lift is moving down.
The lift is moving up.
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The lift is moving up.
The lift is moving down.
The lift is moving down.
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The lift is moving down.
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The lift is moving down.
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The lift is moving down.
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The lift is moving up.
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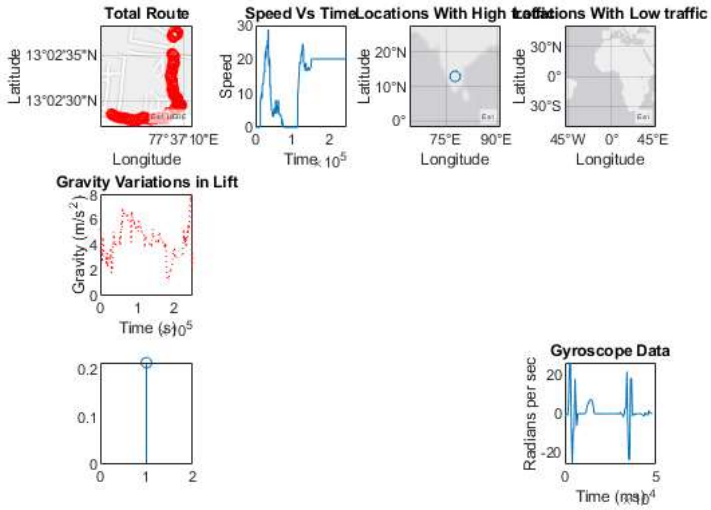

Light Sensor

```
[light12] = Data_Set;
[Area] = Data_Set(:,34);
light_intensity = light12(:,13);
disp('Light intensity');
disp(light_intensity);
presentarea = Area(:,1);
brightness_level(light_intensity);
findpower(light_intensity, presentarea);
```

```
Light intensity
   172
   239
   200
     2
   179
   394
   195
   173
   173
    44
    43
    43
    47
   194
   192
   173
   170
   478
   219
   248
    34
    33
     5
    20
     1
     6
     2
    15
    14
    33
   148
    18
    13
   157
   276
     3
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    10
   213
   208
   196
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15	Moderate
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29	Bright
13	Moderate
12	Dark
32	Moderate
30	Moderate
26	Moderate
15	Bright
8	Moderate
5	Moderate
6	Moderate
12	Dark
3	Moderate
2	Dark
3	Moderate
2	Dark
2	Moderate
5	Dark
8	Moderate
1	Moderate
1	Moderate
9	Moderate
1	Moderate
1	Moderate
2	Bright
2	Moderate
13	Bright
67	Moderate
13	Bright
1	Dark
1	Moderate
1	Dark
2	Moderate
12	Dark
1	Moderate
2	Dark
2	Moderate
2	Dark
2	Moderate
2	Dark
2	Moderate
2	Dark
2	Moderate
2	Dark
2	Moderate
3	Dark
3	Moderate
4	Dark
0	Moderate
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Dark
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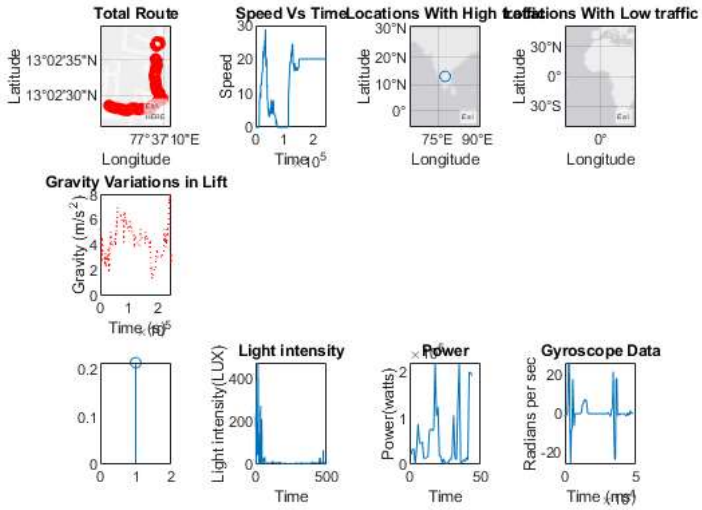


Accelerometer

Import data from text file

Script for importing data from the following text file:

```
filename: G:\pavan_matlab\MBD\data_sensor.csv
```

Auto-generated by MATLAB on 20-Dec-2020 18:09:54

Set up the Import Options and import the data

```
opts = delimitedTextImportOptions("NumVariables", 31);

% Specify range and delimiter
opts.DataLines = [3, Inf];
opts.Delimiter = ";";

% Specify column names and types
opts.VariableNames = ["ACCELEROMETERXms", "ACCELEROMETERYms", "ACCELEROMETERZms", "GRAVITYXms", "GRAVITYYms", "GRAVITYZms", "LINEARACCELERATIONXms", "LINEARAC
opts.VariableTypes = ["double", "double", "double", "double", "double", "double", "double", "double", "double", "double", "double", "double", "double", "double

% Specify file level properties
opts.ExtraColumnsRule = "ignore";
opts.EmptyLineRule = "read";
opts.ConsecutiveDelimitersRule = "join";

% Specify variable properties
opts = setvaropts(opts, ["LOCATIONLatitude", "LOCATIONLongitude", "LOCATIONAltitudeM", "LOCATIONSpeedKmh", "LOCATIONAccuracyM", "LOCATIONORIENTATION", "YYYYMO
opts = setvaropts(opts, ["LOCATIONLatitude", "LOCATIONLongitude", "LOCATIONAltitudeM", "LOCATIONSpeedKmh", "LOCATIONAccuracyM", "LOCATIONORIENTATION", "Satell

% Import the data
tbl = readtable("Team_1_Data_Set.xlsx", opts);
```

Convert to output type

```
ACCELEROMETERXms = tbl.ACCELEROMETERXms;
ACCELEROMETERYms = tbl.ACCELEROMETERYms;
ACCELEROMETERZms = tbl.ACCELEROMETERZms;
GRAVITYXms = tbl.GRAVITYXms;
GRAVITYYms = tbl.GRAVITYYms;
GRAVITYZms = tbl.GRAVITYZms;
LINEARACCELERATIONXms = tbl.LINEARACCELERATIONXms;
LINEARACCELERATIONYms = tbl.LINEARACCELERATIONYms;
LINEARACCELERATIONZms = tbl.LINEARACCELERATIONZms;
GYROSCOPEXrads = tbl.GYROSCOPEXrads;
GYROSCOPEYrads = tbl.GYROSCOPEYrads;
GYROSCOPEZrads = tbl.GYROSCOPEZrads;
LIGHTlux = tbl.LIGHTlux;
MAGNETICFIELDXT = tbl.MAGNETICFIELDXT;
MAGNETICFIELDYT = tbl.MAGNETICFIELDYT;
MAGNETICFIELDZT = tbl.MAGNETICFIELDZT;
ORIENTATIONZazimuth = tbl.ORIENTATIONZazimuth;
ORIENTATIONXpitch = tbl.ORIENTATIONXpitch;
ORIENTATIONYroll = tbl.ORIENTATIONYroll;
PROXIMITYi = tbl.PROXIMITYi;
SOUNDLEVELdB = tbl.SOUNDLEVELdB;
LOCATIONLatitude = tbl.LOCATIONLatitude;
LOCATIONLongitude = tbl.LOCATIONLongitude;
LOCATIONAltitudeM = tbl.LOCATIONAltitudeM;
LOCATIONAltitudegoogleM = tbl.LOCATIONAltitudegoogleM;
LOCATIONSpeedKmh = tbl.LOCATIONSpeedKmh;
LOCATIONAccuracyM = tbl.LOCATIONAccuracyM;
LOCATIONORIENTATION = tbl.LOCATIONORIENTATION;
SatellitesInRange = tbl.SatellitesInRange;
TimeSinceStartInMs = tbl.TimeSinceStartInMs;
YYYYMODDHHMISS_SSS = tbl.YYYYMODDHHMISS_SSS;
```

Import the data

```
[input0_0] = xlsread('Team_1_Data_Set.xlsx','A2:C28');
[input0_1] = xlsread('Team_1_Data_Set.xlsx','AD2:AD28');
input = [input0_0,input0_1];
```

Create output variable

```
data = input;
```

Create table

```
data1 = table;
```

Allocate imported array to column variable names

```
data1.ACCELEROMETERXms = data(:,1);
data1.ACCELEROMETERYms = data(:,2);
data1.ACCELEROMETERZms = data(:,3);
data1.Timesincestartinms = data(:,4);
```

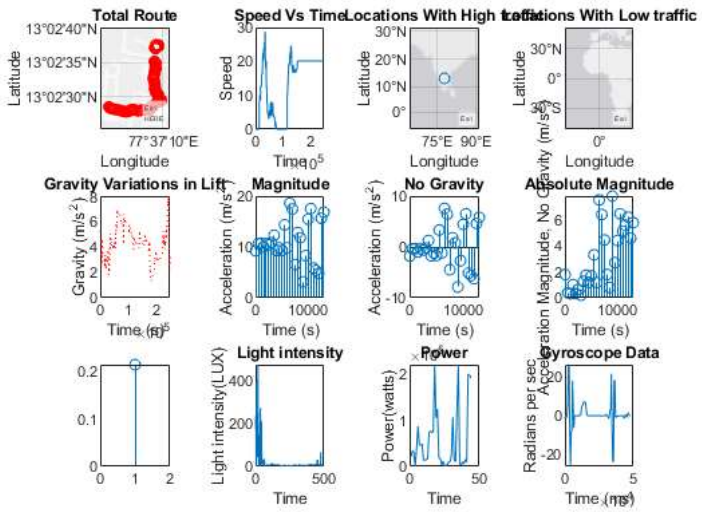
Clear temporary variables

```
clear opts tb1 input0_0 input0_1 R
% steps_acceleration
% Counts No of Steps from Acceleration Data
ax=data1.ACCELEROMETERXms;
ay=data1.ACCELEROMETERYms;
az=data1.ACCELEROMETERZms;
t=data1.Timesincestartinms;
stepcount = 0;
% Changes in Acceleration Sensors will indicate steps
disp('Walking')
length = sqrt(sum(ax.^2 + ay.^2 + az.^2, 2));
disp(length);
% Plot magnitude
subplot(3,4,6);
stem(t, length);
xlabel('Time (s)');
ylabel('Acceleration (m/s^2)');
title('Magnitude')
% Remove effects of gravitity
magNoGrav = length - mean(length);
subplot(3,4,7);
stem(t, magNoGrav);
xlabel('Time (s)');
ylabel('Acceleration (m/s^2)');
title('No Gravity')
% Absolute magnitude
amag = abs(magNoGrav);
subplot(3,4,8);
stem(t, amag);
title('Absolute Magnitude')
xlabel('Time (s)');
ylabel('Acceleration Magnitude, No Gravity (m/s^2)');
% step counting
if(length>=2)
    stepcount = stepcount+1;
```

```
    disp('stepcount')
end
```

```
Walking
    9.2303
   10.6378
   10.7131
   10.0150
   10.7010
   10.3884
   10.8256
   12.2977
    9.2779
    9.8352
    9.3291
   14.3526
    9.8460
   18.6051
   17.4766
    6.5500
   12.8347
   11.8252
    3.1520
    8.3045
   15.4630
   17.5382
    5.8634
    5.3997
    4.7830
   15.6501
   16.8507

stepcount
```



Functions

```
function findpower(lightint, prsntar)
 power = lightint .* prsntar;
 toplot(lightint, power);
 function toplot(light_intensity, power)
   subplot(3,4,10);
   plot(light_intensity);
   title("Light intensity");
   xlabel("Time");
   ylabel("Light intensity(LUX)");
   subplot(3,4,11);
   plot(power);
   title("Power");
   xlabel("Time");
  ylabel("Power(watts)");
 end
end
function brightness_level(light_intensity)
 for index = 1:44
    if light_intensity(index,1) <= 100
         disp("Dark");
    end
    if (100 < light_intensity(index,1) < 200)
         disp("Moderate");
    end
     if light_intensity(index,1) > 200
         disp("Bright");
     end
 end
end
```