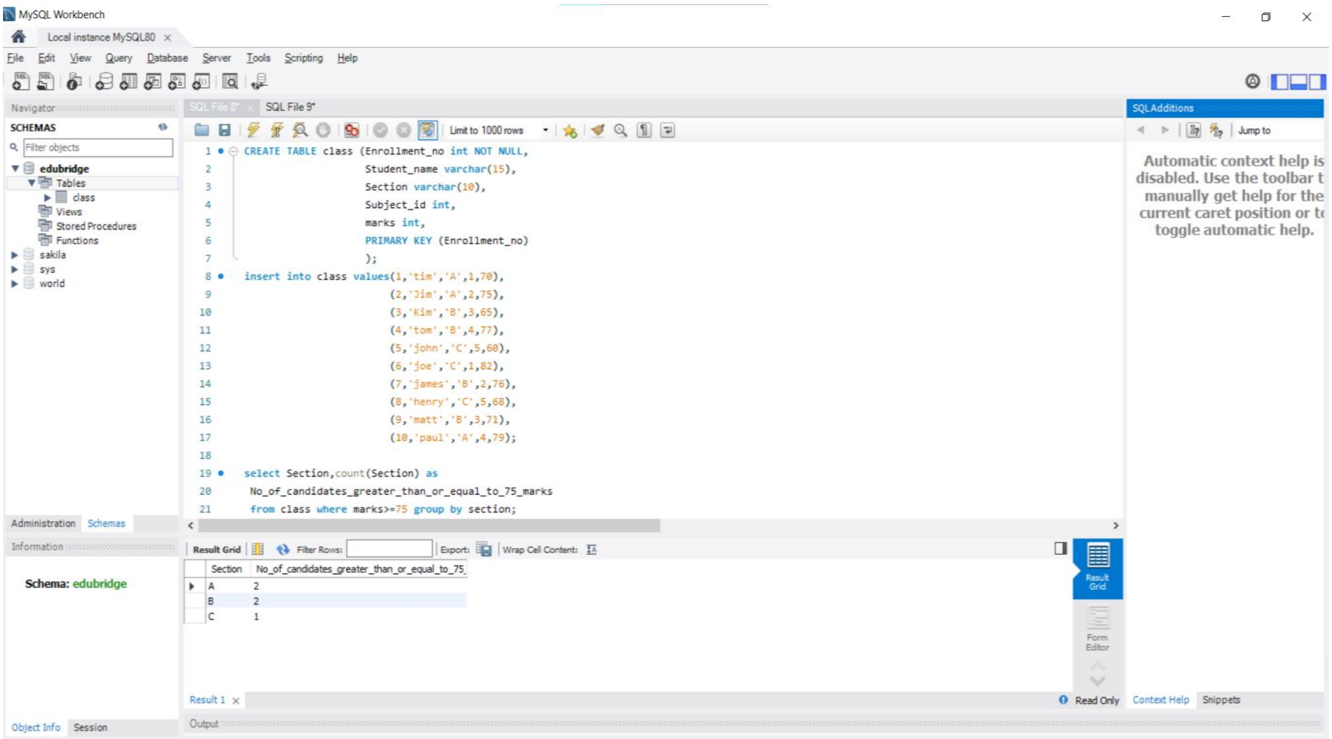
EDUBRIDGE ASSIGNMENT

Task -1:SQL

Answer:



```
CREATE TABLE class (Enrollment_no int NOT NULL,
                    Student_name varchar(15),
                    Section varchar(10),
                    Subject_id int,
                    marks int,
                    PRIMARY KEY (Enrollment_no)
                    );
insert into class values(1,'tim','A',1,70),
                        (2,'Jim','A',2,75),
                        (3,'Kim','B',3,65),
                        (4,'tom','B',4,77),
                        (5,'john','C',5,60),
                        (6,'joe','C',1,82),
                        (7,'james','B',2,76),
                        (8,'henry','C',5,68),
                        (9,'matt','B',3,71),
                        (10,'paul','A',4,79);

select Section,count(Section) as
 No_of_candidates_greater_than_or_equal_to_75_marks
 from class where marks>=75 group by section;
```

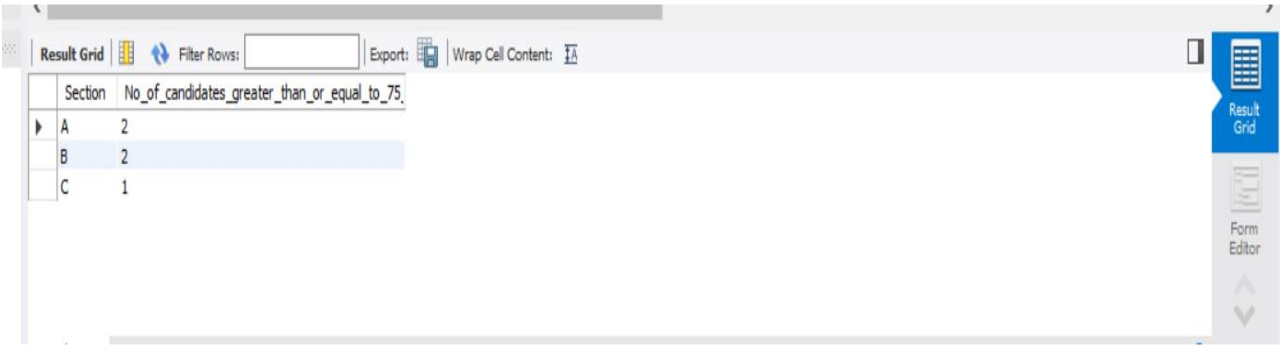
Section	No_of_candidates_greater_than_or_equal_to_75_
A	2
B	2
C	1

Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.

```
CREATE TABLE class (Enrollment_no int NOT NULL,
            Student_name varchar(15),
            Section varchar(10),
            Subject_id int,
            marks int,
            PRIMARY KEY (Enrollment_no)
            );
insert into class values(1,'tim','A',1,70),
                              (2,'Jim','A',2,75),
                              (3,'Kim','B',3,65),
                              (4,'tom','B',4,77),
(5,'john','C',5,60),
(6,'joe','C',1,82),
(7,'james','B',2,76),
(8,'henry','C',5,68),
(9,'matt','B',3,71),
(10,'paul','A',4,79);
```

```
select Section,count(Section) as
 No_of_candidates_greater_than_or_equal_to_75_marks
 from class where marks>=75 group by section;
```

output:

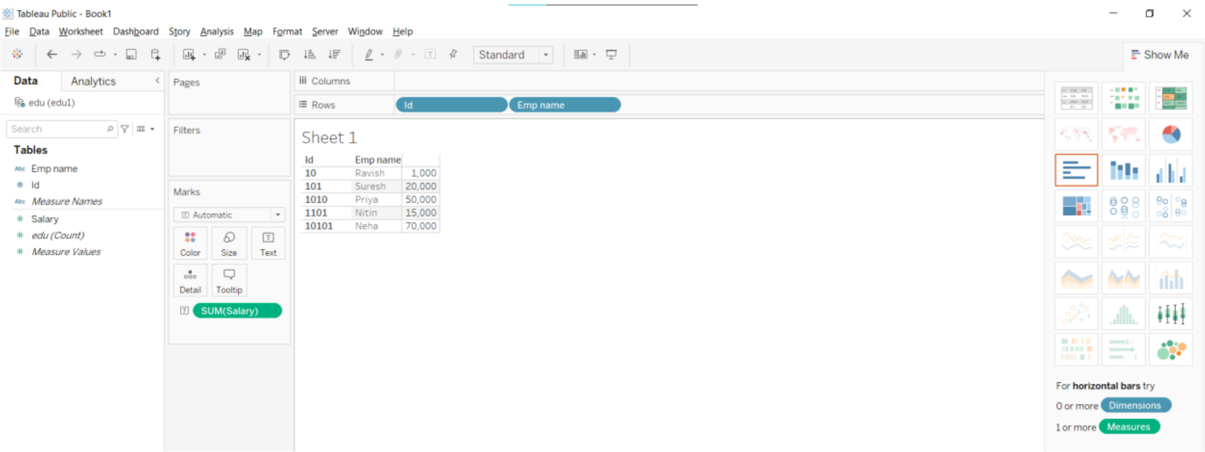


Section	No_of_candidates_greater_than_or_equal_to_75
A	2
B	2
C	1

Task 2: Tableau

Answer:

Load data from excel and select rows



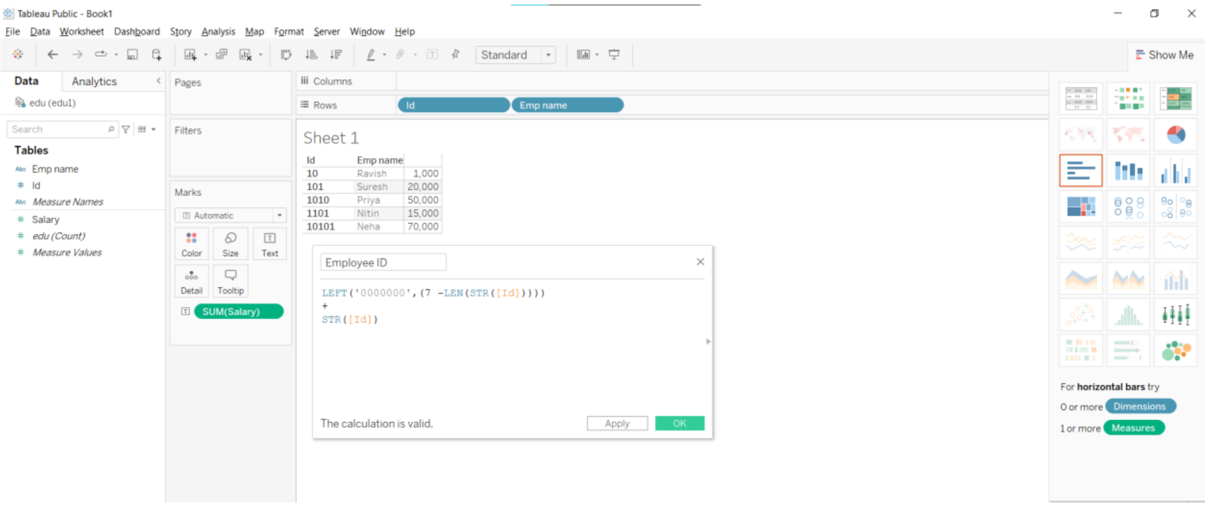
Sheet 1

Id	Emp name	
10	Ravish	1,000
101	Suresh	20,000
1010	Priya	50,000
1101	Nitin	15,000
10101	Neha	70,000

Then create calculated filed to achieve the given condition using the formula

LEFT('0000000',(7 -LEN(STR([Id]))))+STR([Id])

And name the row as Employee Id as show below



Sheet 1

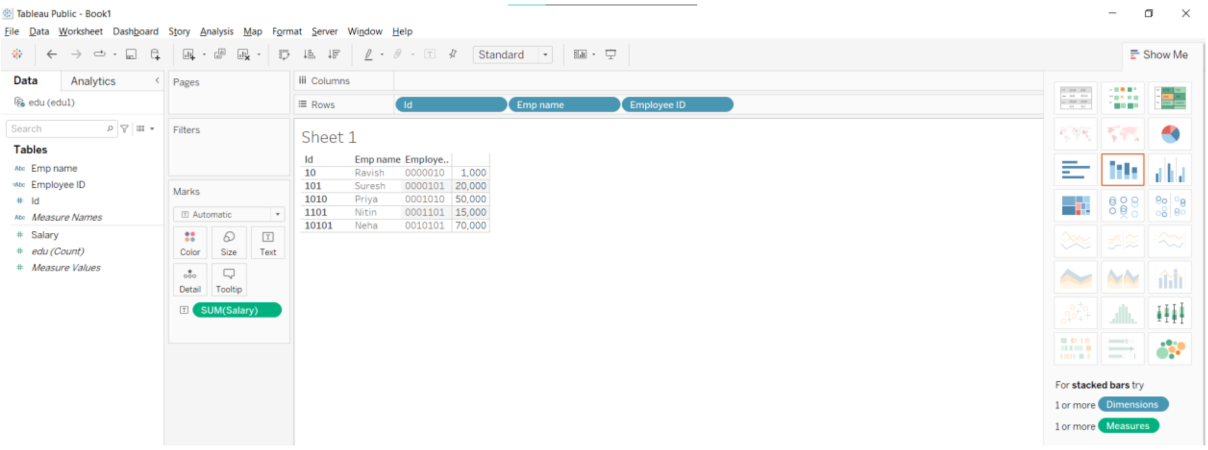
Id	Emp name	
10	Ravish	1,000
101	Suresh	20,000
1010	Priya	50,000
1101	Nitin	15,000
10101	Neha	70,000

Employee ID

```
LEFT('0000000',(7 -LEN(STR([Id]))))
+
STR([Id])
```

The calculation is valid.

After applying the formula we can achieve the task as shown below

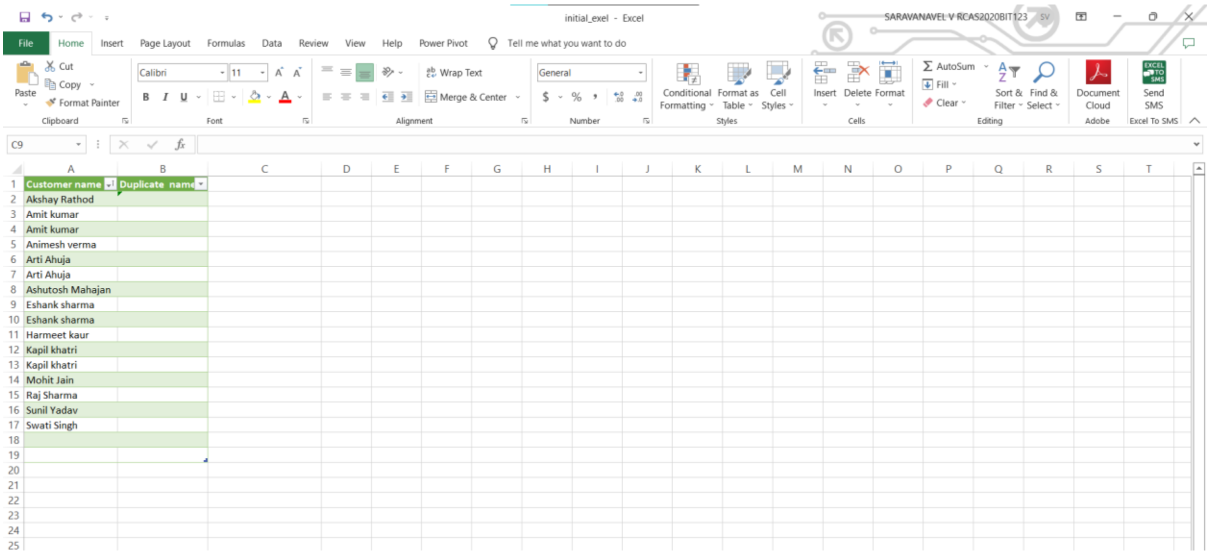


Sheet 1

Id	Emp name	Employe..	
10	Ravish	0000010	1,000
101	Suresh	0000101	20,000
1010	Priya	0001010	50,000
1101	Nitin	0001101	15,000
10101	Neha	0010101	70,000

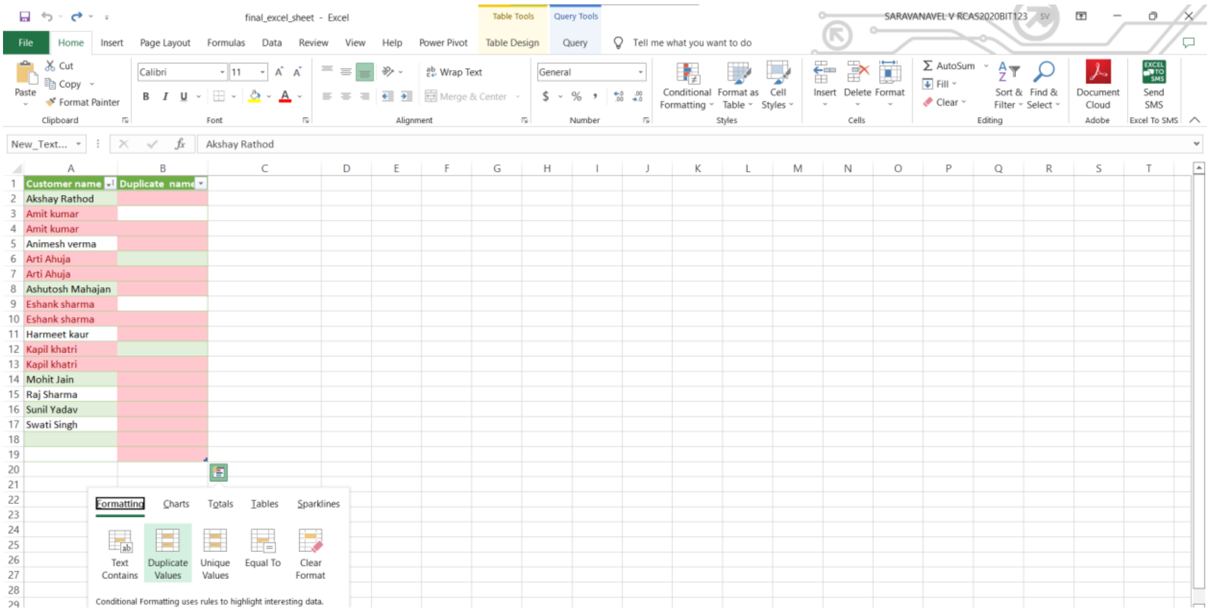
Task 3:EXCEL

Load the given table in excel



	A	B
1	Customer name	Duplicate name
2	Akshay Rathod	
3	Amit kumar	
4	Amit kumar	
5	Animesh verma	
6	Arti Ahuja	
7	Arti Ahuja	
8	Ashutosh Mahajan	
9	Eshank sharma	
10	Eshank sharma	
11	Harmeet kaur	
12	Kapil khatri	
13	Kapil khatri	
14	Mohit Jain	
15	Raj Sharma	
16	Sunil Yadav	
17	Swati Singh	

Then apply conditional formatting for duplicate values as shown below



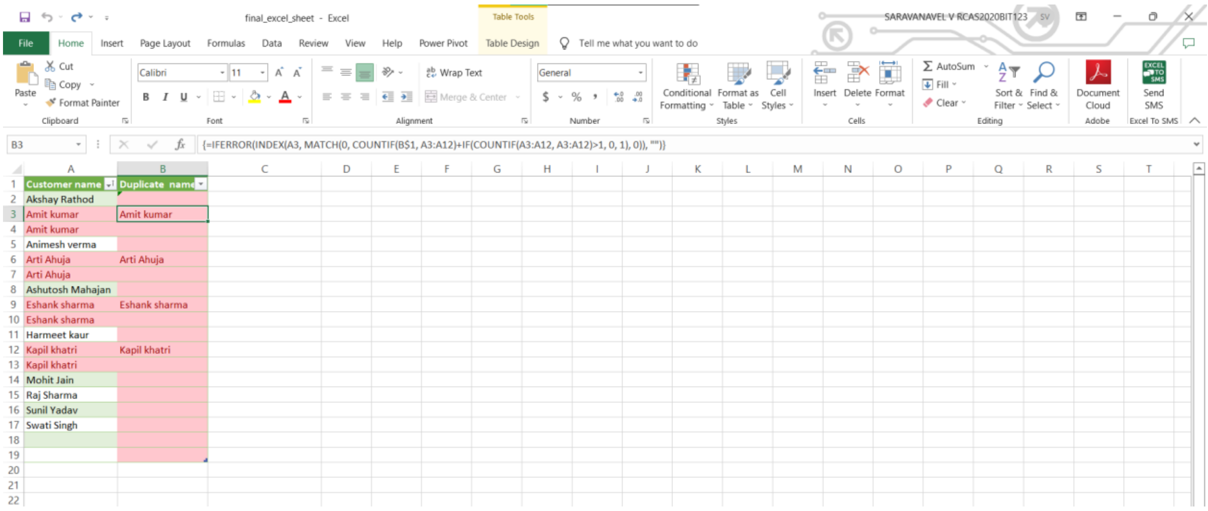
Akshay Rathod

	A	B
1	Customer name	Duplicate name
2	Akshay Rathod	
3	Amit kumar	
4	Amit kumar	
5	Animesh verma	
6	Arti Ahuja	
7	Arti Ahuja	
8	Ashutosh Mahajan	
9	Eshank sharma	
10	Eshank sharma	
11	Harmeet kaur	
12	Kapil khatri	
13	Kapil khatri	
14	Mohit Jain	
15	Raj Sharma	
16	Sunil Yadav	
17	Swati Singh	

Conditional Formatting uses rules to highlight interesting data.

Then apply the given formula and drag it to all cells

=IFERROR(INDEX(A3, MATCH(0, COUNTIF(B$1, A3:A12)+IF(COUNTIF(A3:A12, A3:A12)>1, 0, 1), 0)), "")



B3

{=IFERROR(INDEX(A3, MATCH(0, COUNTIF(B$1, A3:A12)+IF(COUNTIF(A3:A12, A3:A12)>1, 0, 1), 0)), "")}

	A	B
1	Customer name	Duplicate name
2	Akshay Rathod	
3	Amit kumar	Amit kumar
4	Amit kumar	
5	Animesh verma	
6	Arti Ahuja	Arti Ahuja
7	Arti Ahuja	
8	Ashutosh Mahajan	
9	Eshank sharma	Eshank sharma
10	Eshank sharma	
11	Harmeet kaur	
12	Kapil khatri	Kapil khatri
13	Kapil khatri	
14	Mohit Jain	
15	Raj Sharma	
16	Sunil Yadav	
17	Swati Singh	
18		
19		
20		
21		
22		

Task 4:Machine Learning

Machine Learning Task

classify fetal health to avoid the abnormalities for the child and mother while giving birth

Importing libraries

In [1]:

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.express as px
from sklearn.model_selection import train_test_split
from sklearn import preprocessing
from sklearn.preprocessing import StandardScaler
from sklearn.pipeline import Pipeline
from sklearn.linear_model import LogisticRegression
from sklearn.tree import DecisionTreeClassifier
from sklearn.ensemble import RandomForestClassifier
from sklearn.svm import SVC
#from sklearn.svm import LinearSVC
#from sklearn.model_selection import GridSearchCV
from sklearn.model_selection import cross_val_score
from sklearn.metrics import precision_score, recall_score, confusion_matrix, classificat
from sklearn import metrics
#from sklearn.metrics import roc_curve, auc, roc_auc_score
```

In [2]:

```
import warnings
warnings.filterwarnings("ignore")
```

Load Data

In [3]:

```
train_data = pd.read_csv("train.csv")
test_data=pd.read_csv("test.csv")
val_data=pd.read_csv("val.csv")
```

comparing test and validation data

In [4]:

```
test_data.shape
```

Out[4]:

```
(426, 21)
```

In [5]:

```
val_data.shape
```

Out[5]:

```
(426, 21)
```

In [6]:

```
com=test_data[test_data.apply(tuple,1).isin(val_data.apply(tuple,1))]
```

In [7]:

```
scv=com.to_csv("sample.csv",index=False)
```

In [8]:

```
diff=pd.read_csv("sample.csv")
```

In [9]:

```
diff.shape
```

Out[9]:

```
(426, 21)
```

As seen there is no difference between test and validataion set

Pre-processing and EDA

In [10]:
```
train_data.head()
```

Out[10]:

	baseline value	accelerations	fetal_movement	uterine_contractions	light_decelerations	severe_decelerations	prolong
0	142.0	0.000	0.000	0.007	0.000	0.0	
1	122.0	0.000	0.000	0.006	0.002	0.0	
2	129.0	0.005	0.003	0.001	0.000	0.0	
3	136.0	0.006	0.000	0.008	0.000	0.0	
4	144.0	0.000	0.000	0.006	0.000	0.0	

5 rows × 22 columns

In [11]:
```
train_data.isnull().sum()  #No null values
```

Out[11]:
```
baseline value                                            0
accelerations                                             0
fetal_movement                                            0
uterine_contractions                                      0
light_decelerations                                       0
severe_decelerations                                      0
prolongued_decelerations                                  0
abnormal_short_term_variability                           0
mean_value_of_short_term_variability                      0
percentage_of_time_with_abnormal_long_term_variability    0
mean_value_of_long_term_variability                       0
histogram_width                                           0
histogram_min                                             0
histogram_max                                             0
histogram_number_of_peaks                                 0
histogram_number_of_zeroes                                0
histogram_mode                                            0
histogram_mean                                            0
histogram_median                                          0
histogram_variance                                        0
histogram_tendency                                        0
fetal_health                                              0
dtype: int64
```

In [12]:
```
train_data.describe()
```

Out[12]:

	baseline value	accelerations	fetal_movement	uterine_contractions	light_decelerations	severe_decelerations
count	1700.000000	1700.000000	1700.000000	1700.000000	1700.000000	1700.000000
mean	133.213529	0.003212	0.010211	0.004356	0.001899	0.000004
std	9.873344	0.003888	0.050124	0.002943	0.002976	0.000059
min	106.000000	0.000000	0.000000	0.000000	0.000000	0.000000
25%	126.000000	0.000000	0.000000	0.002000	0.000000	0.000000
50%	133.000000	0.002000	0.000000	0.004000	0.000000	0.000000

75%	140.000000	0.006000	0.003000	0.006000	0.003000	0.000000
max	159.000000	0.019000	0.481000	0.015000	0.015000	0.001000

8 rows × 22 columns

In [13]:

```
train_data.duplicated().sum()
```

Out[13]:

```
7
```

In [14]:

```
train_df=train_data.drop_duplicates()
```

In [15]:

```
train_df.duplicated().sum()
```

Out[15]:

```
0
```

In [16]:

```
train_df.shape
```

Out[16]:

```
(1693, 22)
```

In [17]:

```
train_df.nunique()
```

Out[17]:

```
baseline value                                            47
accelerations                                             20
fetal_movement                                            92
uterine_contractions                                      16
light_decelerations                                       16
severe_decelerations                                       2
prolongued_decelerations                                   6
abnormal_short_term_variability                           75
mean_value_of_short_term_variability                      57
percentage_of_time_with_abnormal_long_term_variability    84
mean_value_of_long_term_variability                      240
histogram_width                                          153
histogram_min                                            109
histogram_max                                             85
histogram_number_of_peaks                                 18
histogram_number_of_zeroes                                 7
histogram_mode                                            84
histogram_mean                                            99
histogram_median                                          91
histogram_variance                                       127
histogram_tendency                                         3
fetal_health                                               3
dtype: int64
```

In [18]:

```
train_df['fetal_health'].unique()
```

Out[18]:

```
array([1., 3., 2.])
```

In [19]:

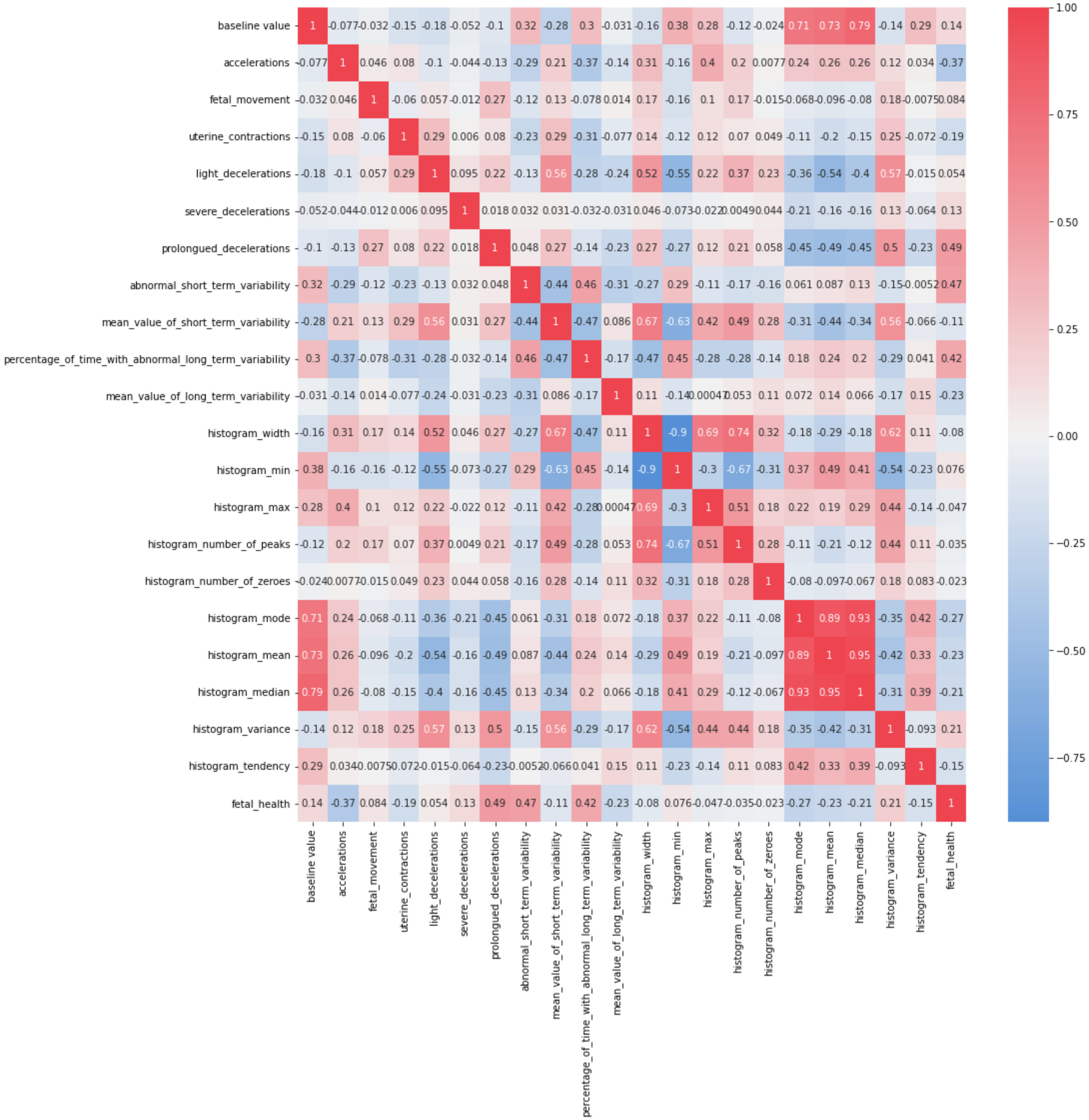
```
train_df['fetal_health'].value_counts()
```

Out[19]:

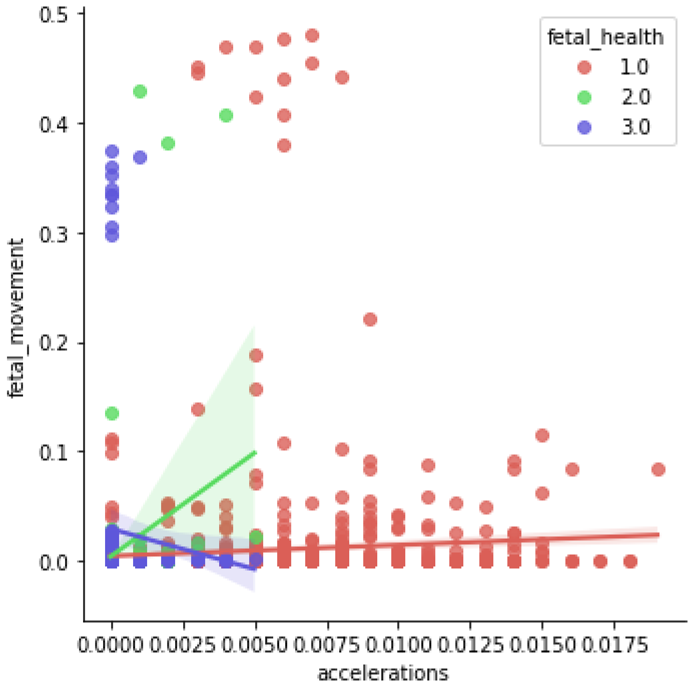
```
1.0    1317
2.0     235
3.0     141
Name: fetal_health, dtype: int64
```

In [20]:

```
plt.figure(figsize=(15,15))
cmap = sns.diverging_palette(250,10, s=80, l=55, n=9, as_cmap=True)
sns.heatmap(train_df.corr(),annot=True,cmap = cmap, center=0)
plt.show()
```

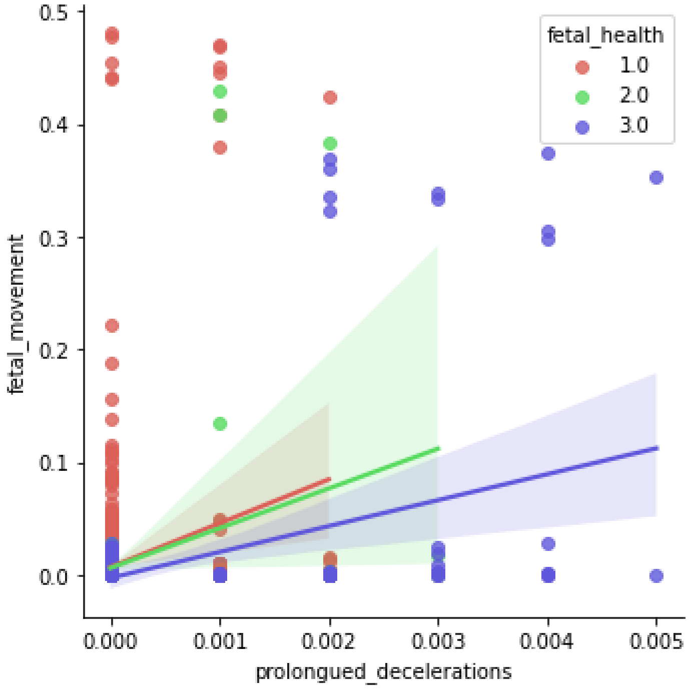


```
In [21]: sns.lmplot(data = train_df, x = "accelerations", y = "fetal_movement", palette = 'hls',
         plt.show()
```



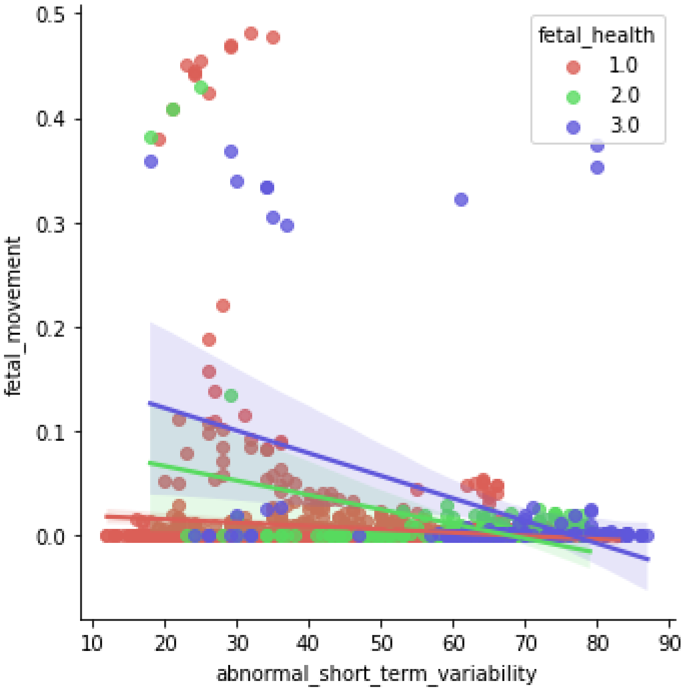
In [22]:

```
sns.lmplot(data = train_df, x = "prolongued_decelerations", y = "fetal_movement", palett
plt.show()
```

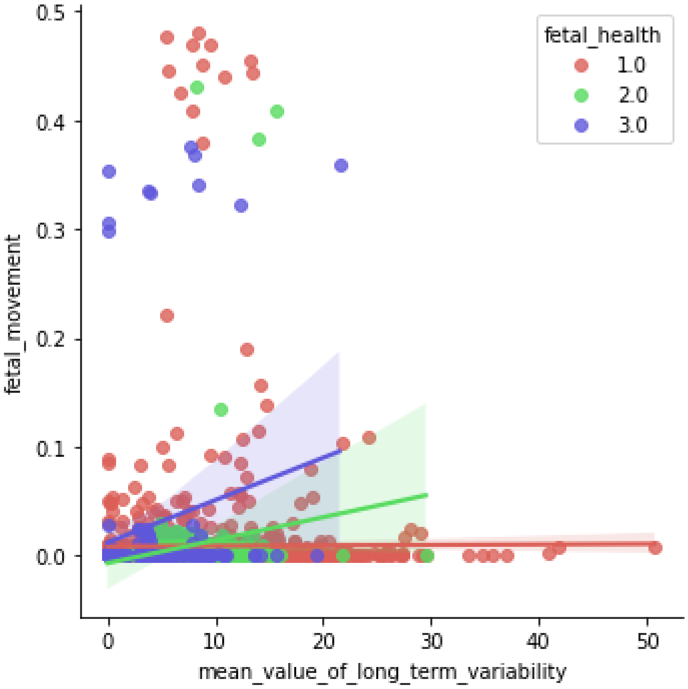


In [23]:

```
sns.lmplot(data = train_df, x = "abnormal_short_term_variability", y = "fetal_movement",
plt.show()
```



```
In [24]: sns.lmplot(data = train_df, x = "mean_value_of_long_term_variability", y = "fetal_moveme
         plt.show()
```



Model building

```
In [25]: x = train_df.drop(['fetal_health'],axis=1)
         y = train_df['fetal_health']
```

```
In [26]: print(x.shape)
         print(y.shape)
```

```
(1693, 21)
(1693,)
```

```
In [27]: column_names = list(x.columns)
         scaler = StandardScaler()
         x_scaled = scaler.fit_transform(x)
         x_df = pd.DataFrame(x_scaled, columns = column_names)
```

In [28]:

```
x_train, x_test, y_train, y_test = train_test_split(x_df, y, test_size = 0.2, random_sta
```

In [29]:

```
print(x_train.shape)
print(y_train.shape)
print(x_test.shape)
print(y_test.shape)
```

```
(1354, 21)
(1354,)
(339, 21)
(339,)
```

In [30]:

```
pipeline_lr = Pipeline([('lr_classifier', LogisticRegression(random_state= 42))])
pipeline_dt = Pipeline([('dt_classifier', DecisionTreeClassifier(random_state= 42))])
pipeline_rf = Pipeline([('rf_classifier', RandomForestClassifier())])
pipeline_svc = Pipeline([('sv_classifier', SVC())])
pipelines = [pipeline_lr, pipeline_dt, pipeline_rf, pipeline_svc]
pipe_dict = {0:'Logistic Regression', 1:'Decision Tree', 2:'Random Forest', 3:'SVC'}
```

In [31]:

```
for pipe in pipelines:
    pipe.fit(x_train, y_train)
```

Cross validation score

In [32]:

```
cv_results_accuracy = []
for i, model in enumerate(pipelines):
    cv_score = cross_val_score(model, x_train, y_train, cv = 10)
    cv_results_accuracy.append(cv_score)
    print("%s: %f " % (pipe_dict[i], cv_score.mean()))
```

```
Logistic Regression: 0.880381
Decision Tree: 0.923932
Random Forest: 0.932048
SVC: 0.892941
```

As seen above the cross validation score of random forest is high.so selecting random forest for model prediction

In [33]:

```
pred_rfc = pipeline_rf.predict(x_test)
```

In [34]:

```
print("Classification Report for classifier %s:\n%s\n" % (pipeline_rf, metrics.classific
```

```
Classification Report for classifier Pipeline(steps=[('rf_classifier', RandomForestClass
ifier())]):
              precision    recall  f1-score   support

         1.0       0.93      0.99      0.96       263
         2.0       0.93      0.58      0.72        48
         3.0       0.89      0.86      0.87        28

    accuracy                           0.92       339
   macro avg       0.92      0.81      0.85       339
weighted avg       0.92      0.92      0.92       339
```

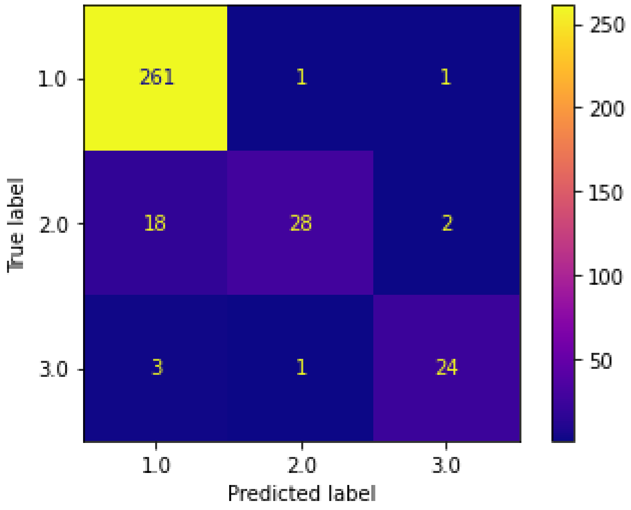
confusion matrix and accuracy

In [35]:

```
matrix = confusion_matrix(y_test, pred_rfc)
print('Confusion Matrix : \n', matrix)
```

```
Confusion Matrix :
 [[261   1   1]
 [ 18  28   2]
 [  3   1  24]]
```

In [36]:
```
from sklearn.metrics import plot_confusion_matrix
plot_confusion_matrix(pipeline_rf, x_test, y_test,cmap="plasma")
plt.show()
```



In [37]:
```
print("Accuracy"+str(accuracy_score(y_test,pred_rfc)))
```

```
Accuracy0.9233038348082596
```

Saving Model prediction

In [38]:
```
pred_rfc
```

Out[38]:
```
array([1., 1., 1., 2., 1., 1., 1., 1., 1., 1., 1., 2., 1., 1., 1., 1., 1.,
       1., 3., 1., 1., 1., 2., 1., 1., 3., 1., 1., 1., 2., 1., 1., 1., 1.,
       1., 1., 1., 1., 3., 1., 1., 1., 1., 2., 1., 3., 1., 1., 1., 1., 1.,
       1., 1., 1., 1., 3., 1., 1., 2., 1., 1., 1., 1., 1., 2., 3., 3., 1.,
       1., 1., 1., 1., 1., 1., 1., 1., 2., 1., 1., 1., 1., 1., 1., 1., 1.,
       3., 1., 1., 1., 1., 1., 1., 1., 3., 1., 1., 1., 1., 2., 1., 2., 1.,
       1., 2., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 2., 1., 1., 1., 1.,
       1., 1., 1., 2., 1., 1., 1., 1., 1., 1., 1., 1., 2., 1., 1., 1., 1.,
       1., 1., 1., 1., 1., 2., 1., 1., 3., 1., 1., 1., 1., 1., 1., 1., 1.,
       1., 1., 1., 1., 1., 1., 2., 1., 1., 1., 1., 1., 1., 2., 1., 2., 1.,
       1., 1., 1., 1., 1., 1., 1., 2., 1., 3., 1., 1., 1., 3., 1., 3., 3.,
       1., 2., 1., 1., 3., 1., 1., 1., 1., 1., 2., 1., 1., 1., 1., 1., 2.,
       1., 1., 1., 3., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.,
       1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 3., 1.,
       1., 1., 2., 1., 1., 1., 1., 3., 2., 1., 1., 1., 1., 1., 1., 1., 1.,
       1., 1., 1., 2., 1., 3., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1., 3.,
       1., 1., 1., 1., 3., 1., 3., 1., 1., 1., 1., 1., 1., 1., 1., 1., 1.,
       1., 1., 1., 3., 1., 1., 2., 1., 1., 1., 2., 1., 1., 1., 1., 1., 3.,
       1., 1., 1., 3., 1., 1., 1., 1., 1., 1., 1., 2., 1., 1., 3., 1., 1.,
       1., 1., 1., 1., 1., 1., 1., 2., 1., 1., 2., 1., 1., 3., 1., 1.])
```

In [39]:
```
df = pd.DataFrame(pred_rfc,columns =['fetal_health'])
```

In [40]:
```
df.head()
```

Out[40]:

	fetal_health
0	1.0
1	1.0

2	1.0
3	2.0
4	1.0

In [41]:

```
df.to_csv('output.csv',header=df.columns,index=False)
```

In [42]:

```
dfg=pd.read_csv("output.csv")
dfg.head()
```

Out[42]:

	fetal_health
0	1.0
1	1.0
2	1.0
3	2.0
4	1.0

In [43]:

```
dfg.shape
```

Out[43]:

```
(339, 1)
```