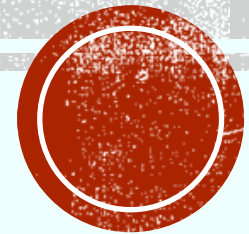


# **HOUSE GRADE PREDICTION**

## **Mini Project 2**



Submitted by:  
Sumit



# INTRODUCTION

- Property buyers have different requirements. To facilitate this, real estate companies prefer categorizing various houses into different grades based on various parameters.
- This would help agents in identifying the type of house a customer is looking for.
- This way, the search for the house can be narrowed down by focusing only on the 'condition of the house'.
- The Grade (condition of the house that ranges from A (Best) – E (Worst) ) can also be used by existing owners to list their properties for sale.
- Grading helps them in arriving at a price of the house.



# PROBLEM STATEMENT

- Our main goal is to identify the type of house a customer is looking for.
- In order to achieve this goal, a predictive model can be built to find out the best grade of house.



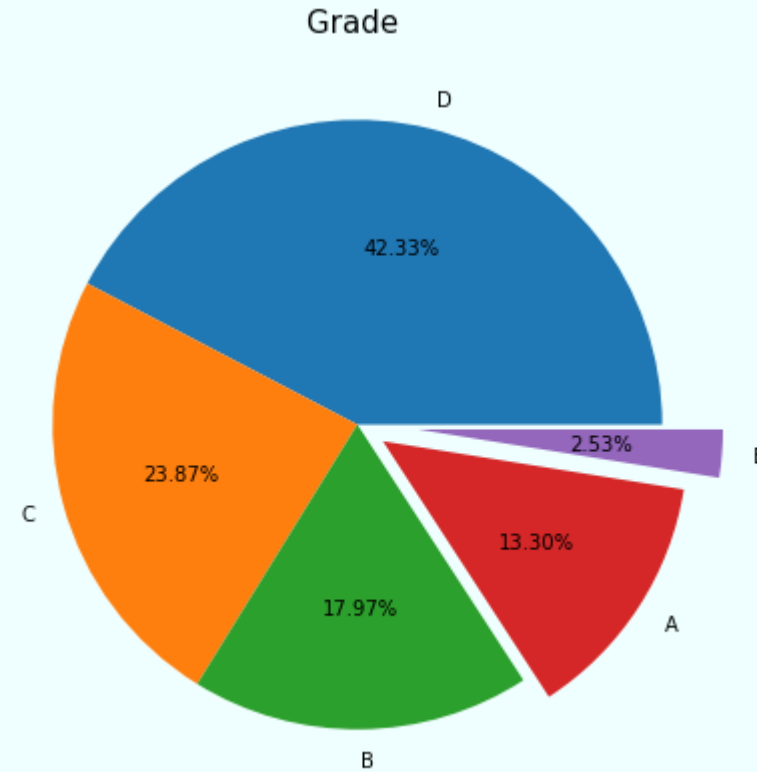
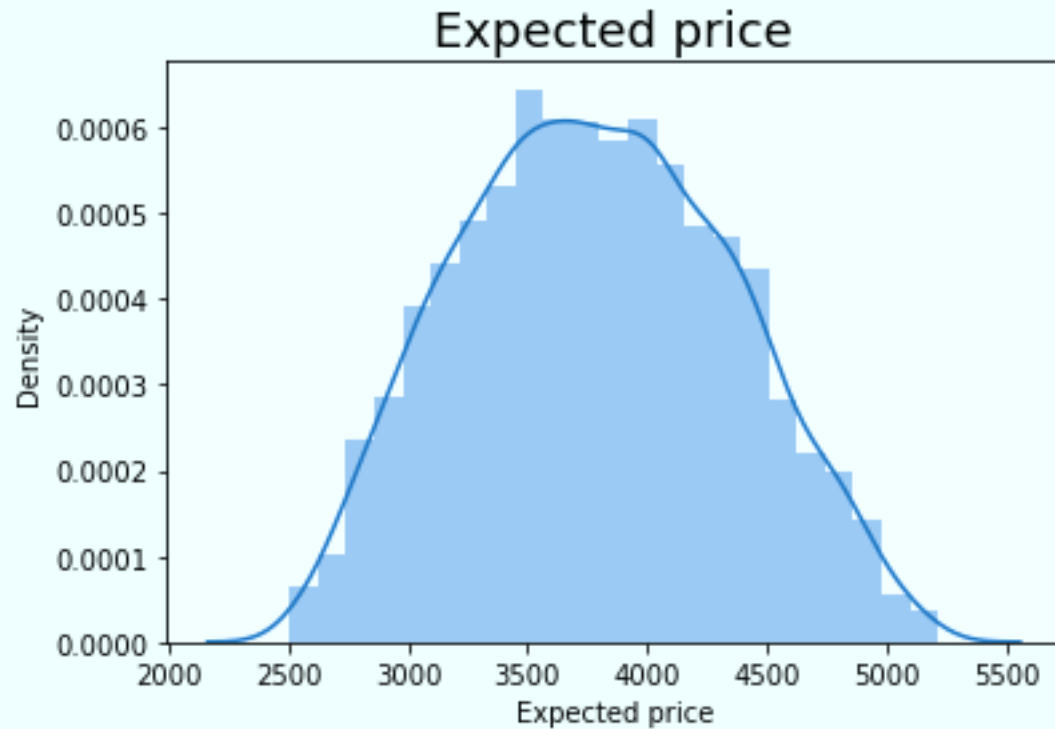
# METHODOLOGY

- Read the data.
- Summarize the data.
- Data structure (Type of data).
- Data Visualization.
- Data preprocessing(Missing value treatment , Feature Selection, Hot-coding, Data scaling).
- Splitting of data into train and test.
- Selecting right algorithm for model building.



# EDA(EXPLORATORY DATA ANALYSIS)

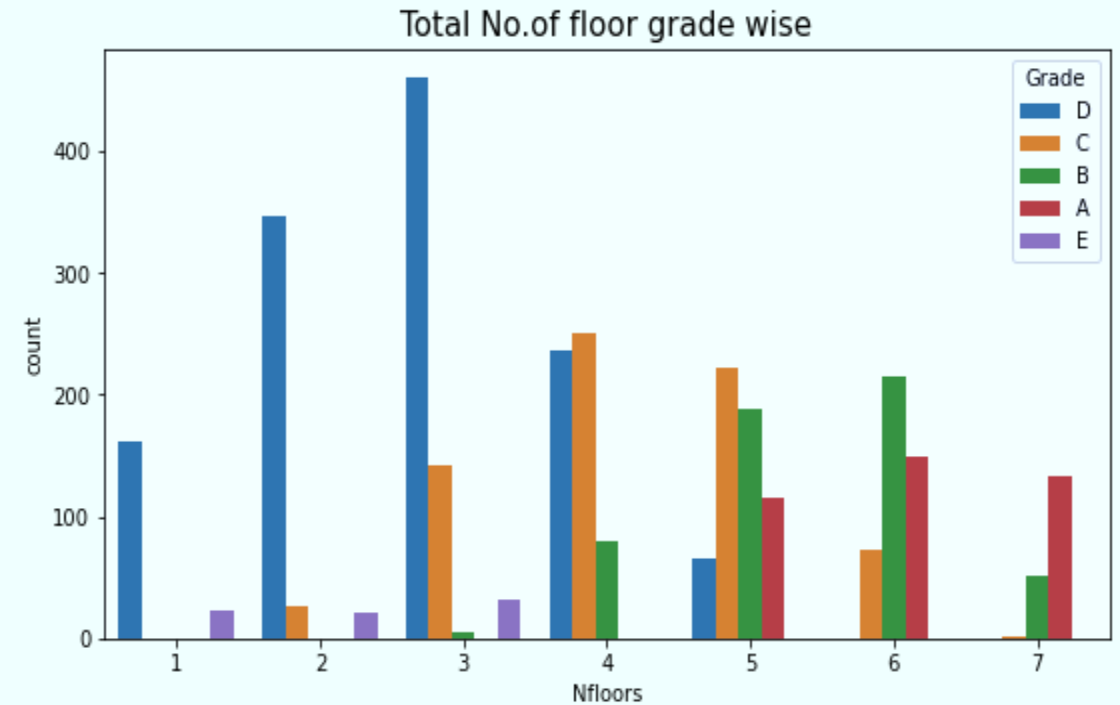
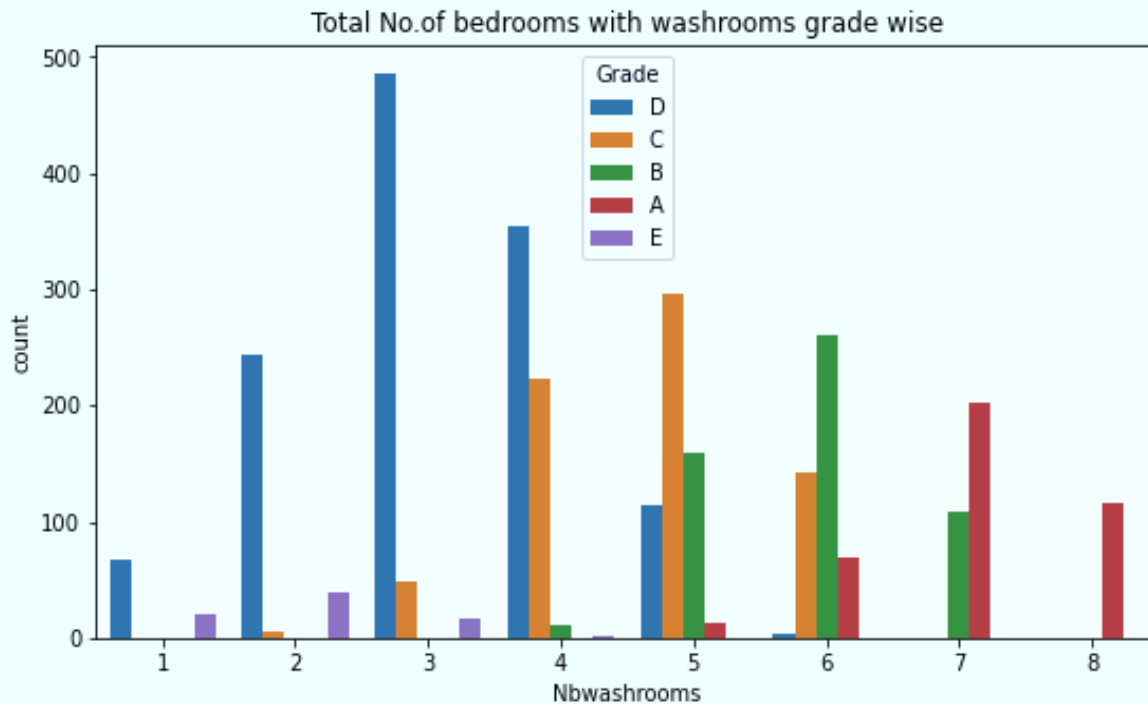
## Analysis of Price and Grade



- Price of data is normally distributed and the price start from 2500 till 5200.
- Grade contain maximum no. of houses in D category which is 42.3%.



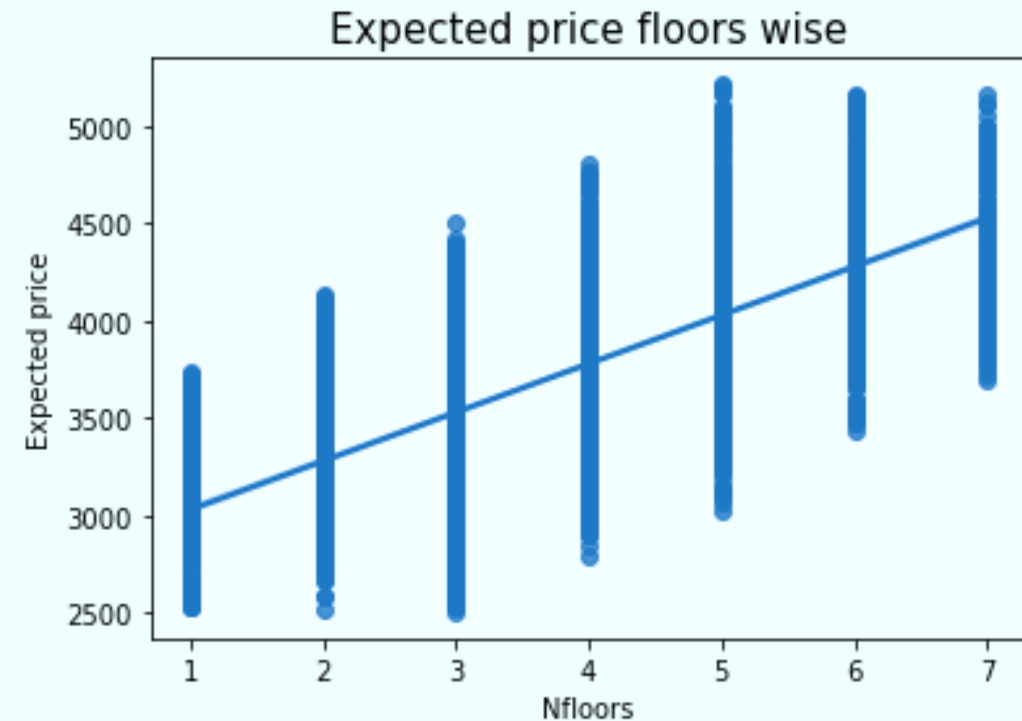
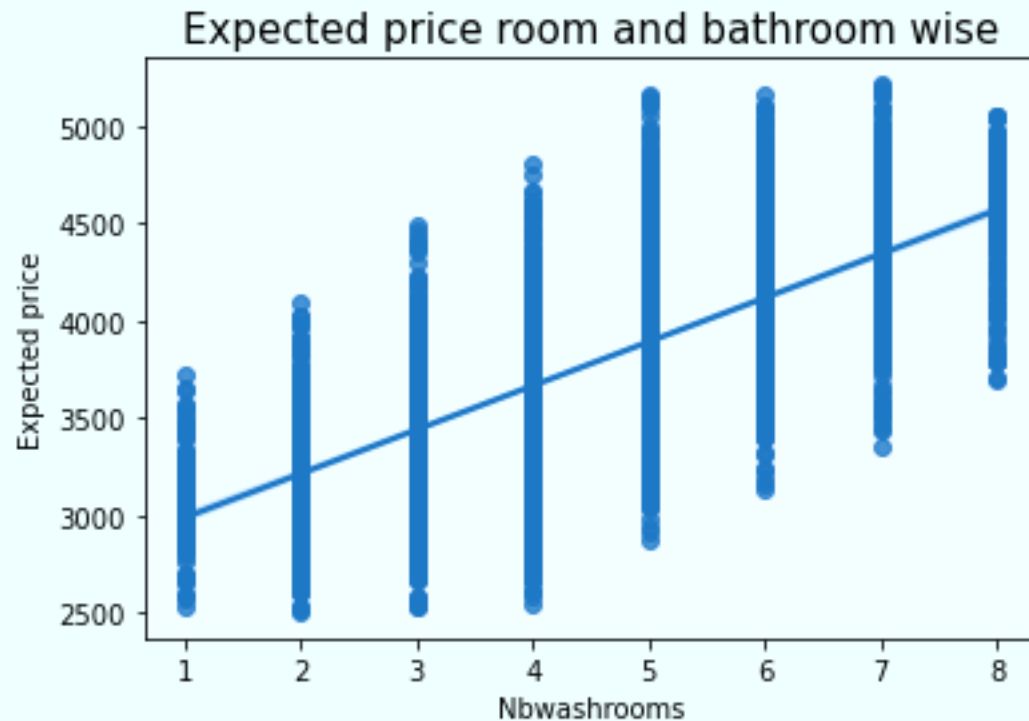
# GRADE WISE BEDROOMS WASHROOMS & FLOORS



- Maximum no. of count bedrooms with washrooms are available in grade D, C then B.
- Same with the floors max. no. of floors are available in grade D, C and B.



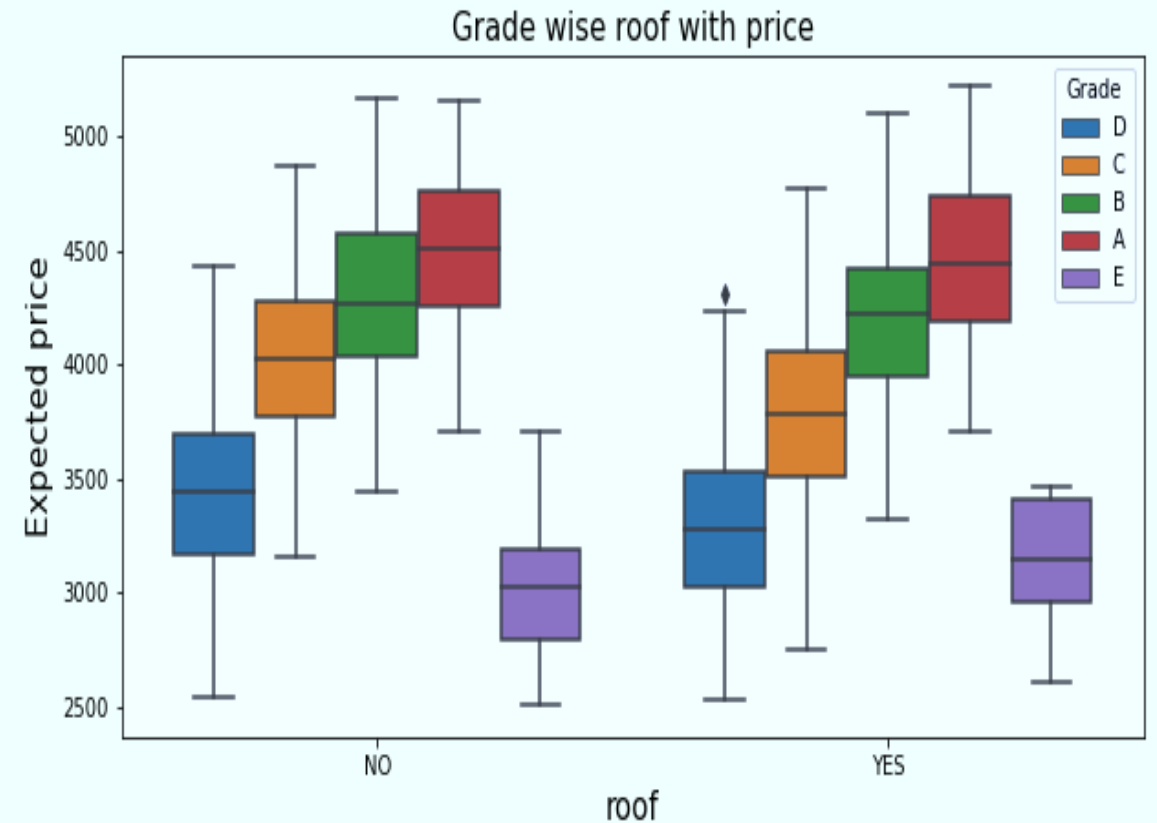
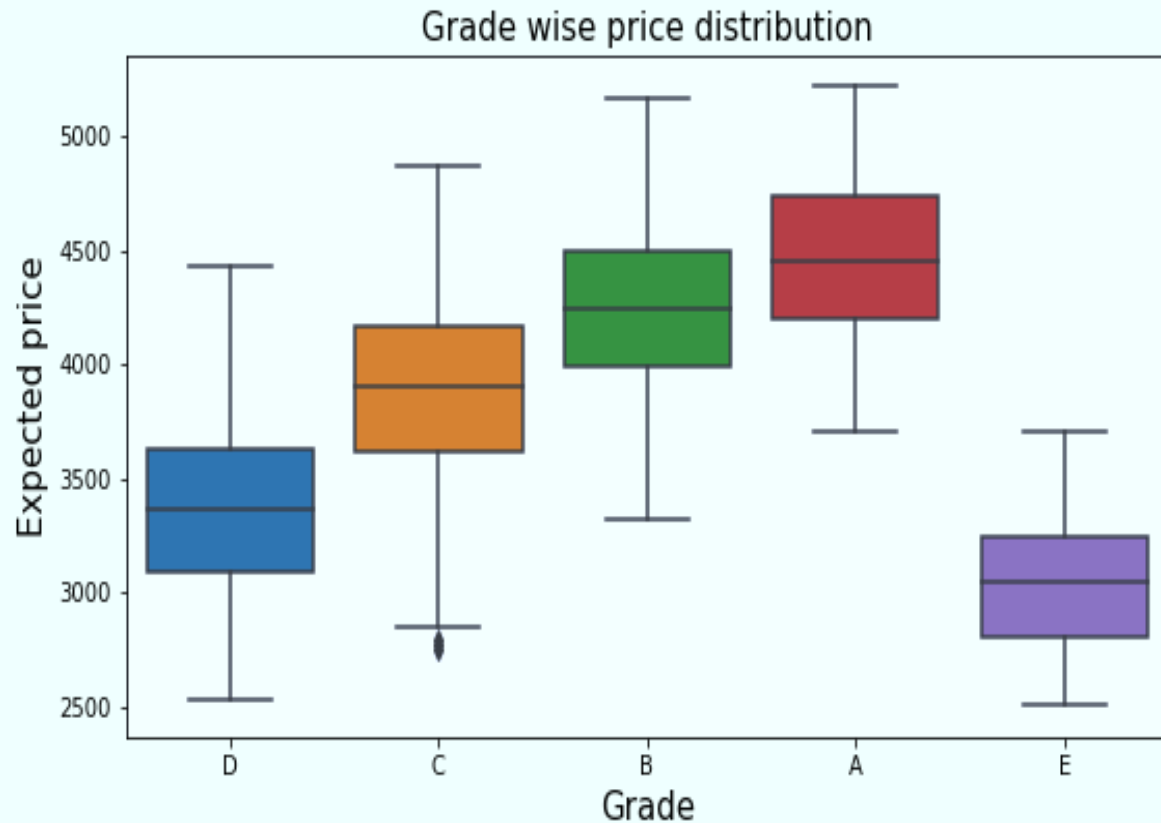
# PRICE WITH ROOMS, WASHROOMS & FLOORS



- As we can see clearly and say if the requirements of bedroom , washrooms are increasing the expected price also increases.
- Same with no. of floors the requirements of floors increases expected price increases.



# GRADE WISE PRICE & GRADE WISE ROOF PRICE

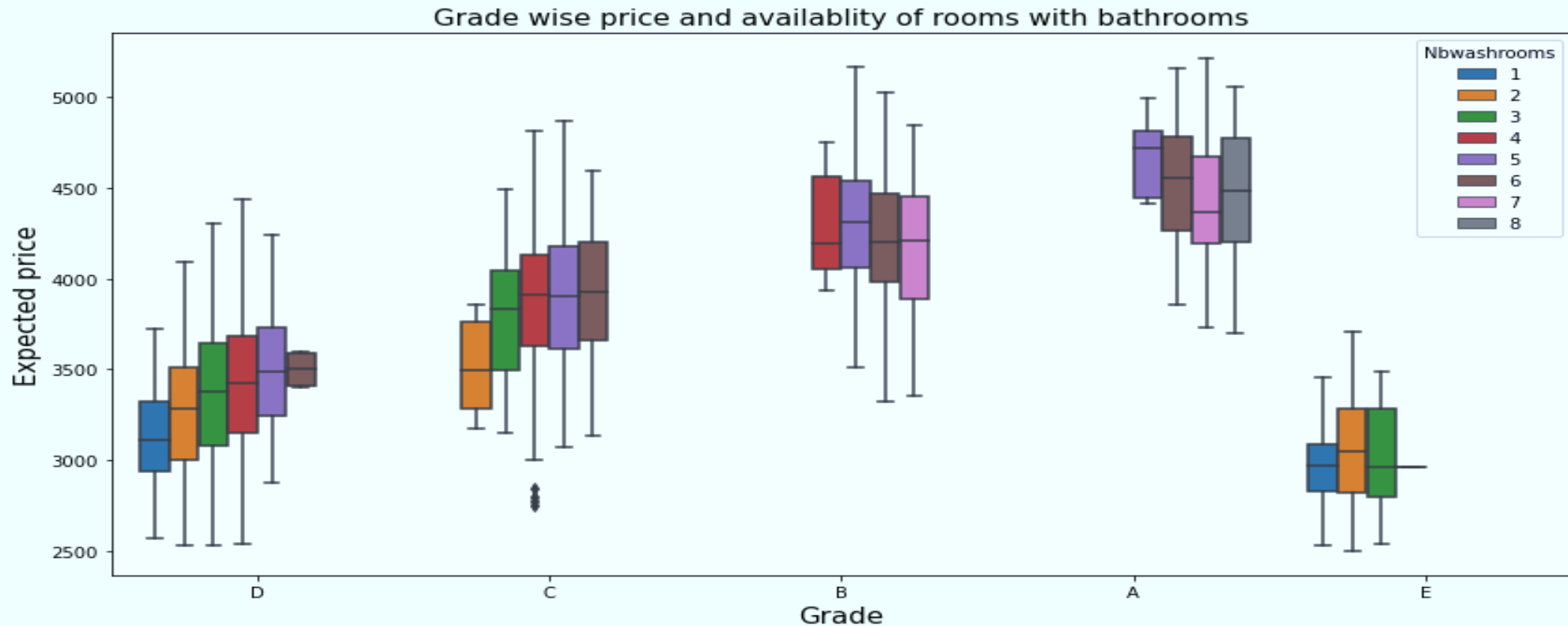


- After analysing grade wise price we get that grade A has the highest price and grade E has the lowest price.
- Roof is not affecting the price a lot so we have almost same price for all the grades.





# GRADE WISE PRICE AND AVAILABILITY OF ROOM WITH BATHROOMS



- Grade wise price and availability of rooms with bathrooms is max. at D grade but its totally depends on the customer requirements.
- Like rooms 3,4,5 they are available in grade A,B,C,D,E.
- But room 1 is only available in grade D and E.



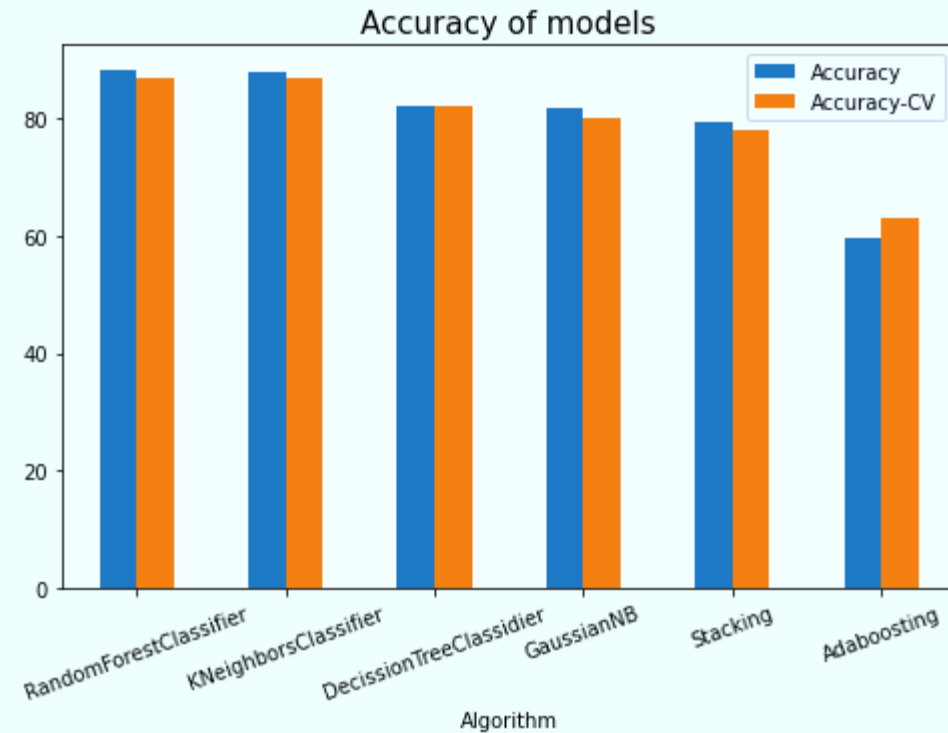
# CLASSIFICATION MODELS

- 1 Naïve bayes
- 2 Decision Tree Classification
- 3 Random-Forest Classification
- 4 AdaBoost Classification
- 5 Stacking Classification
- 6 KNN Classification



# MODELS RESULT(ACCURACY)

Algorithm	Accuracy	Accuracy-CV
RandomForestClassifier	88.11	87.0
KNeighborsClassifier	88.00	87.0
DecissionTreeClassidier	82.11	82.0
GaussianNB	81.89	80.0
Stacking	79.22	78.0
Adaboosting	59.67	63.0

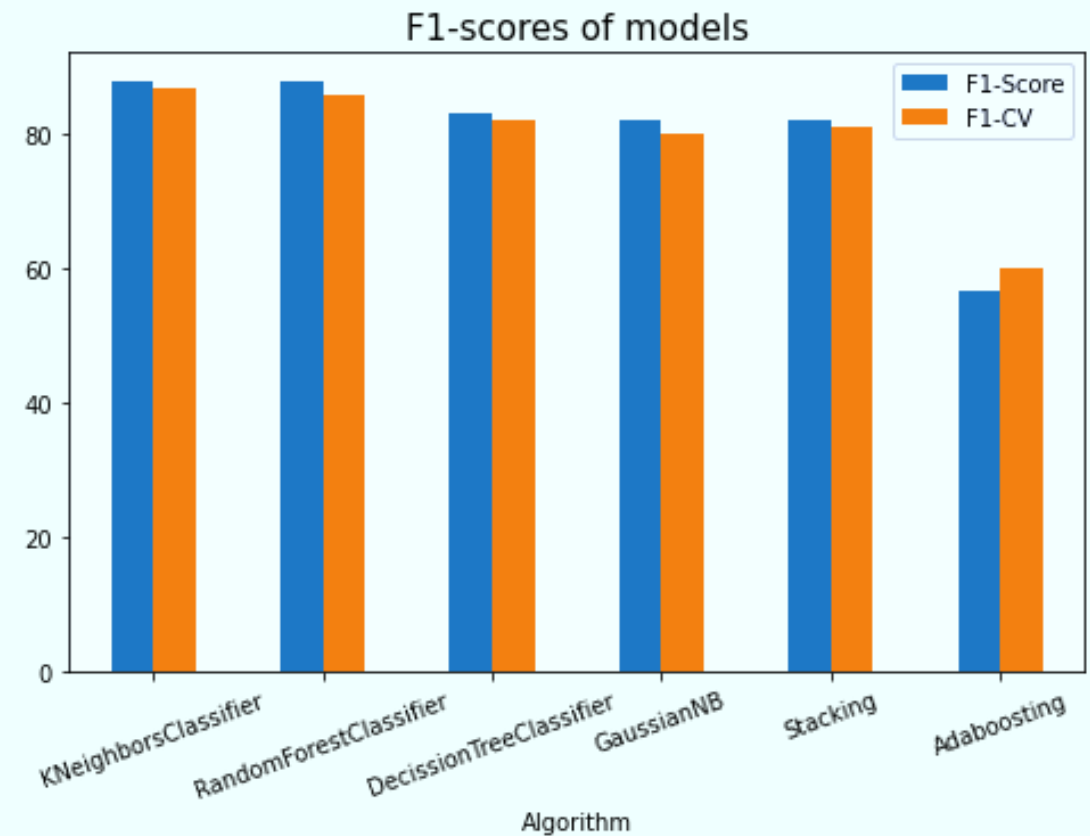


- Random forest and KNN classifier model has the maximum accuracy.



# MODELS RESULT(F1-SCORE)

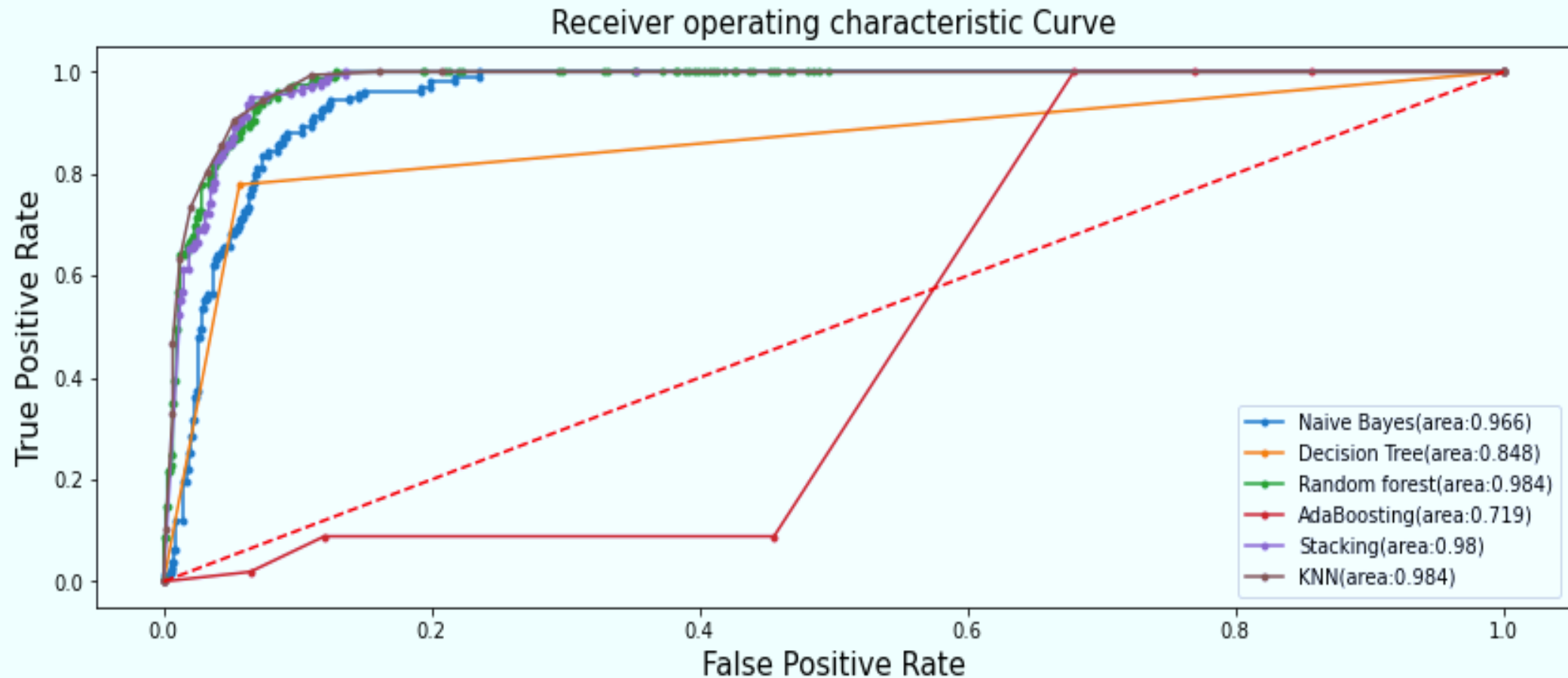
	F1-Score	F1-CV
Algorithm		
KNeighborsClassifier	87.830	87.0
RandomForestClassifier	87.800	86.0
DecissionTreeClassifier	83.050	82.0
GaussianNB	82.244	80.0
Stacking	82.060	81.0
Adaboosting	56.870	60.0



- KNN classifier has the maximum f1-score.



# RECEIVER OPERATING CHARACTERISTIC CURVE



- KNN has the maximum and smooth ROC – AUC curve.



# MODEL CONCLUSION

- By comparing all the models with their F1-score values and Accuracy we find that KNearestNeighbour is best model which give better predictions. So, we consider KNearestNeighbour as the best model for this dataset.



# BUSINESS OBJECTIVE

Row Labels	Max of Expected price	Min of Expected price	Average of Area(total)	Count of Nbwashrooms	Category of rooms
A	5216	3700	330.34	399	4--8
B	5163	3323	326.87	539	4--7
C	4864	2752	328.51	716	2--6
D	4435	2528	322.05	1270	1--6
E	3704	2504	304.63	76	1--3

- From the above table we can easily conclude the availability of room in different grades with their prices.
- From this, business can easily conclude and tell customers that in how many price a customer can get how many room, area and other facilities.
- This help business to satisfy their customers.





THANK  
YOU