



# A STUDY ON UML DIAGRAMS FOR TOURIST PLACE REVIEW SENTIMENT ANALYSIS CLASSIFICATION USING MACHINE LEARNING

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**Abstract:** The use of social media is on the rise right now. On travel websites, millions of users evaluate and rate tourist destinations every day. These reviews may be subjected to sentiment analysis, which will be useful in determining the popularity of tourism destinations. Tourists are able to choose their tour destination with ease based on the results of the sentiment analysis. A use case is a common description of an entire transaction including several procedure objects. Utilizing use case diagrams, such as sequence and cooperation diagrams, the UML language provides an appropriate framework for scenario acquisition. In this paper the various UML Diagrams as a part of the design of the sentiment analysis system is shown. The Dataset has been collected from various tourism review websites.

**Keywords:** UML, Sentiment analysis, machine learning, tourist place

## I. INTRODUCTION

Unified Modelling Language is known as UML. Compared to other popular programming languages like C++, Java, COBOL, etc., UML is unique. A visual language called UML is used to create software designs. A general-purpose visual modelling language for software system visualisation, specification, construction, and documentation is what UML is known as. UML is not just used to represent software systems, despite the fact that this is its most common application. It is also used to simulate systems that are not software-based. For instance, the manufacturing facility's process flow, etc.

## II. REVIEW OF LITERATURE

Things is a The fundamental unit of construction and a representation of an entity. A class is an object's blueprint. The actions of a real-world entity are represented via abstraction. The method of tying the facts together and concealing them from the outside world is called encapsulation. The process of creating new classes from ones that already exist is called inheritance. Polymorphism describes a mechanism that may take on several shapes.

### 2.2.1 EXISTING SYSTEM

The fundamental issue in the tourist sector is data sparsity, and we have made an effort to gather a significant amount of data from diverse tourism websites. From a review of the literature, we may conclude that machine learning can increase classification accuracy in comparison to lexicon-based approaches.

Therefore, research has incorporated sentiment analysis utilising machine learning approaches. The comparison and analysis of reviews sentiment classification results using various machine learning approaches.

### 2.2.2 DISADVANTAGES OF EXISTING SYSTEM

Classification is slower and costlier with respect to time and memory



### **2.2.3 PROPOSED SYSTEM**

In this project author using machine learning algorithms such as SVM, Naïve Bayes and Random Forest to predict sentiments from tourist reviews dataset and then evaluating p performance of Count Vectorizer and TFIDF Vectorizer features extraction algorithms. In this paper author is extracting features from reviews by using both Count Vectorizer and TFIDF Vectorizer and then applying this feature on machine learning algorithms and then calculating accuracy, precision, recall and F1 SCORE between both feature extraction algorithms.

### **2.2.4 ADVANTAGES OF PROPOSED SYSTEM**

We found that TFIDF Vectorization feature extraction algorithm has improved accuracy of classification algorithm as compare to Count Vectorization for given review dataset.

In sentiment classification of tourist place reviews TFIDF Vectorization +RF has given highest accuracy 86% for a research dataset used.

## **III. UML DIAGRAMS**

UML stands for Unified Modelling Language. UML is a standardized general-purpose modelling language in the field of object-oriented software engineering. The standard is managed, and was created by, the Object Management Group.

The goal is for UML to become a common language for creating models of object-oriented computer software. In its current form UML is comprised of two major components: a Meta-model and a notation. In the future, some form of method or process may also be added to; or associated with, UML.

The Unified Modelling Language is a standard language for specifying, Visualization, Constructing and documenting the artifacts of software system, as well as for business modelling and other non-software systems.

The UML represents a collection of best engineering practices that have proven successful in the modelling of large and complex systems. The UML is a very important part of developing objects-oriented software and the software development process. The UML uses mostly graphical notations to express the design of software projects.

The Primary goals in the design of the UML are as follows:

1. Offer consumers an expressive, ready-to-use visual modelling language so they can create and trade meaningful models.
2. Offer methods for specialisation and extensibility to expand the fundamental ideas.
3. Not depend on a certain development methodology or programming language.
4. Offer a formal foundation on which to comprehend the modelling language.
5. Promote the commercial expansion of OO tools.
6. Encourage the use of higher-level development ideas like components, frameworks, patterns, and collaborations.
7. Include top techniques.

## **IV. USE CASE DIAGRAMS**

### **4.1 Use Case Diagram**

The use case diagram is a UML diagram in which each use-case details the behaviour anticipated from software from the perspective of the end-user and relationship as well as offering a quick summary for various components about interaction between use-cases, actors, and systems. Use case diagrams in UML are excellent for:

Defining and structuring functional needs in a system, defining the context and requirements of a system, and modelling the fundamental flow of events in a use case are all examples of representing the objectives of system-user interactions.

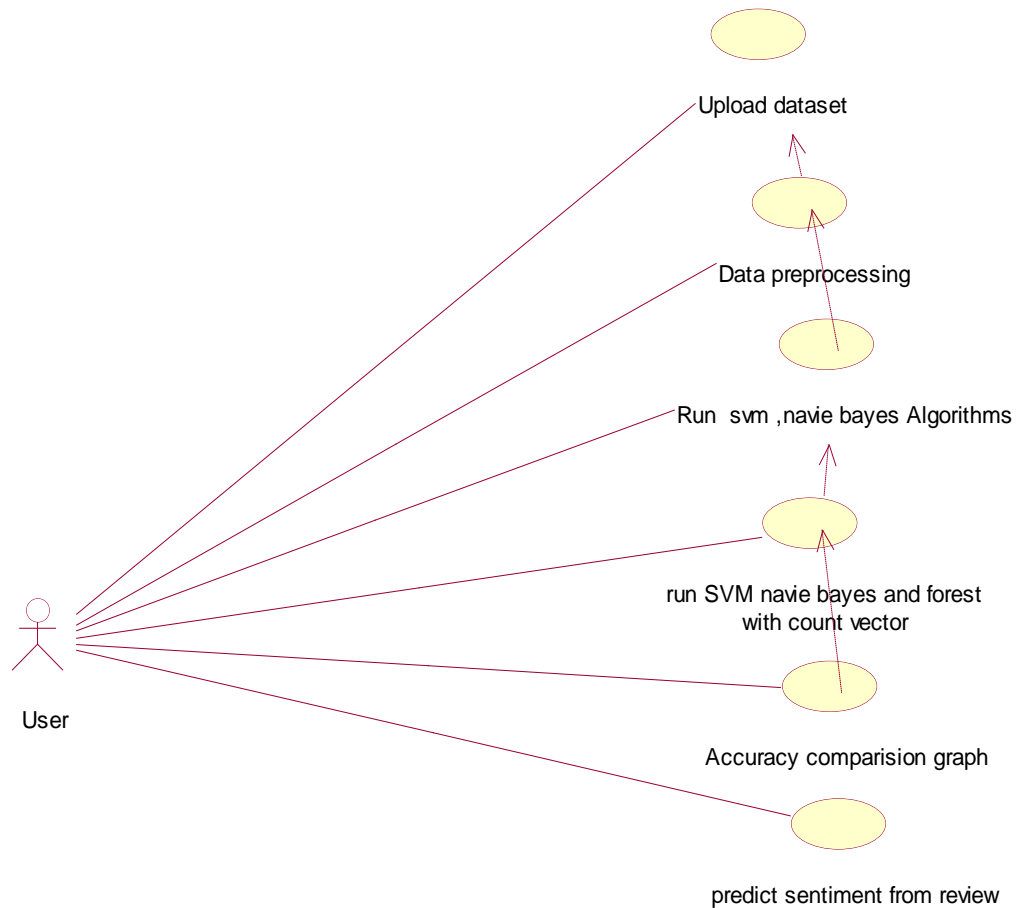


Figure: Use case diagram

4.2 CLASS DIAGRAMS

Class diagrams are among the most helpful UML diagram types because they accurately depict a system's structure by simulating its classes, properties, activities, and connections among objects.

A class diagram's many elements might represent the actual classes that will be coded, the primary objects, or the relationships between classes and objects.

The actual class shape is a rectangle with three rows. The class's name is found in the top row, its attributes are found in the middle row, and its methods or operations are expressed in the bottom portion.

The grouping of classes and subclasses demonstrates the static relationship between each item.

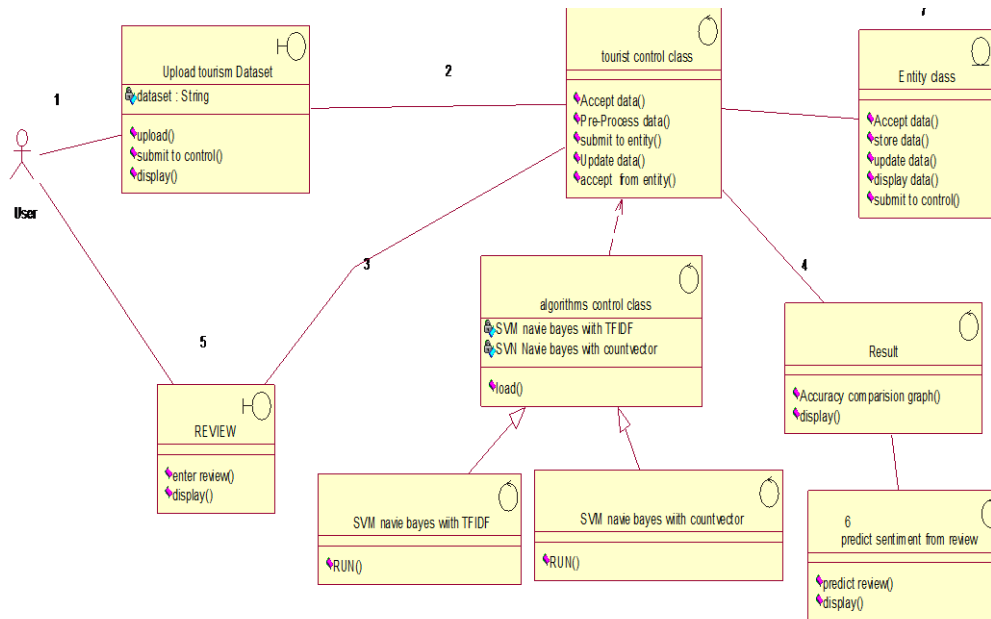


Figure: Class Diagram

4.3 ACTIVITY DIAGRAM

In the activity diagram, the system's process flows are shown. An activity diagram has the same components as a state diagram, including activities, actions, transitions, beginning and final states, and guard conditions.

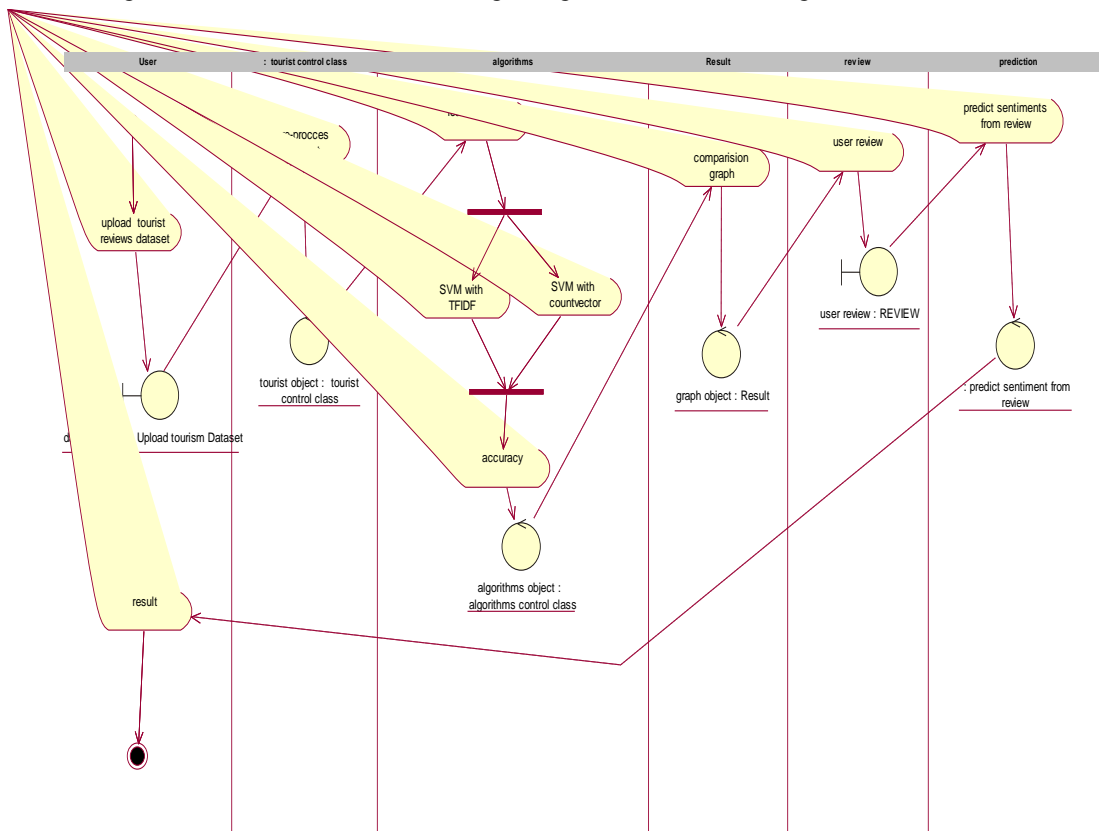


Figure: Activity diagram



#### 4.4 SEQUENCE DIAGRAM

Because they concentrate on lifelines, or the processes and objects that exist concurrently, and the messages sent between them to carry out a function before the lifeline expires, sequence diagrams are a common dynamic modelling approach in UML.

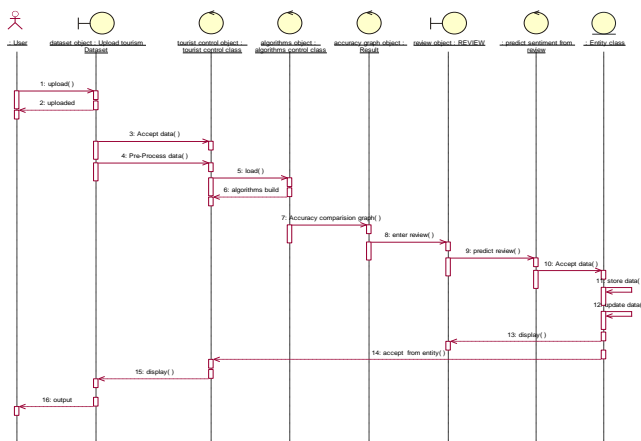


Figure: Sequence diagram

#### V. CONCLUSION

In this paper we have introduced five of the most used and important Structural UML diagrams. From the results presented above, Class diagram as mentioned earlier is a static diagram and it is used to model the unchanging view of a system and is the most used or the most important Structural UML diagram. It is also considered as the foundation for Component and Deployment diagrams. Modelling the deployment aspects of software applications can reduce the complexities of software development, thus deployment diagrams are used. Component diagrams explain the components necessary to execute software functionalities. As explained earlier, an object diagram shows an instance of the system at a particular moment in time, thus it is solid in nature. Package diagrams are used to group classes into packages and also to detangle complex class diagrams. Throughout the software development process, the UML model developing is an essential element and demands that the diagrams are correct and consistent to each other, to ensure a smooth software development process.

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