



## **EXTRACTING USEFUL INFORMATION ABOUT WILDLIFE SANCTUARIES TO IMPROVE TOURISM**

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### **ABSTRACT**

Mobile technology has revolutionized the way we interact with the world around us, and the conservation community has started to embrace this technology to aid in the management and protection of wildlife sanctuaries. This research paper explores the benefits, challenges, and best practices of developing an Android-based app for wildlife sanctuaries. The paper will discuss the potential uses of such an app, including tracking wildlife populations, promoting eco-tourism, and facilitating communication between stakeholders. The challenges associated with app development, including data privacy and ethical concerns, will also be examined. Finally, the paper will provide recommendations for the responsible development and deployment of Android-based apps for wildlife sanctuaries. The app provides a Map navigation feature that can give you directions from your location to your desired sanctuary using Google Maps.

**Keywords - wildlife conservation, eco-tourism, maps and navigation.**

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### **1. INTRODUCTION**

Wildlife sanctuaries are essential for the conservation of endangered species and the preservation of biodiversity. The management and protection of these sanctuaries can be a complex and challenging task, requiring the integration of various technologies and resources. Mobile applications have become increasingly popular in recent years, and they can play a significant role in the management and conservation of wildlife sanctuaries. Android-based apps, in particular, have the potential to provide a range of benefits, from real-time data collection to enhanced visitor experiences. Potential Uses of an Android-Based App for Wildlife Sanctuaries: An Android-based app for wildlife sanctuaries can provide a range of functions, including tracking wildlife populations, facilitating communication between

stakeholders, and promoting eco-tourism. Tracking wildlife populations can be achieved through the use of GPS technology, which can provide real-time data on the location and movement of wildlife within the sanctuary. The app can also be used to facilitate communication between wildlife managers, conservationists, and other stakeholders, allowing for the exchange of information and collaboration. Finally, the app can promote eco-tourism by providing visitors with information on the sanctuary's history, wildlife, and conservation efforts.

***Challenges Associated with App Development:*** The development of an Android-based app for wildlife sanctuaries presents several challenges, including data privacy and ethical concerns. Data collected through the app must be stored and used responsibly, and the privacy of both wildlife and visitors must be respected. There are also ethical concerns related to the use of GPS tracking and the potential impact on wildlife behavior. Additionally, the app must be designed with the needs of both wildlife managers and visitors in mind, ensuring that it is both user-friendly and functional. Practices for Developing and Deploying an Android-Based App for Wildlife Sanctuaries: To ensure the responsible development and deployment of an Android-based app for wildlife sanctuaries, several best practices should be followed. These include conducting a thorough needs assessment to determine the app's intended purpose and target audience, designing the app with the needs of both wildlife managers and visitors in mind, ensuring data privacy and ethical considerations are taken into account, and testing the app extensively before deployment. It is also essential to provide training and support to wildlife managers and visitors to ensure they can effectively use the app.

## **2. LITERATURE SURVEY**

Researchers [1] highlight the potential of mobile technology in encouraging sustainable tourism practices and raising awareness about conservation issues. The application was designed to provide users with information about the flora and fauna of national parks, as well as the cultural and historical significance of the areas. It also includes features such as interactive maps, hiking trails, and virtual reality tours. The authors conducted a survey to evaluate the usability and effectiveness of the application, with positive results. The majority of users found the application easy to use and informative and expressed a desire to use it again in the future. The authors conclude that mobile technology has great potential in promoting sustainable tourism and conservation efforts, and suggest that similar applications be developed for other natural areas around the world.

Researchers [2] present a case study on the participatory design process of a mobile application aimed at promoting sustainable wildlife tourism in Ecuador. The study was conducted in collaboration with a local community and a non-profit organization that focuses on wildlife conservation in the region. The authors used a participatory design approach, which involves active involvement and input from all stakeholders, including end-users, in the design process. The mobile application was designed to provide visitors with information about the local wildlife and their conservation status, as well as recommendations on responsible tourism practices. The authors describe the various stages of the design process, including workshops, interviews, and user testing, and how they incorporated feedback from stakeholders to refine the application's features.

Researchers [3] provide a comprehensive review of the existing literature on wildlife tourism and its relationship with the United Nations Sustainable Development Goals (SDGs). The authors argue that wildlife tourism has the potential to contribute positively to several of the SDGs, including those related to poverty reduction, biodiversity conservation, and sustainable economic growth. However, they also note that the negative impacts of wildlife tourism, such as habitat destruction, disturbance to wildlife, and negative impacts on local communities, must be addressed to ensure the achievement of these goals. The article identifies several key research gaps in the current literature on wildlife tourism and the SDGs, including the need for more comprehensive impact assessments and the need for a better understanding of the relationships between wildlife tourism and different SDGs. The authors also call for greater attention to be paid to the perspectives of local communities and stakeholders in the design and implementation of wildlife tourism initiatives.

Researchers [4] provide a comprehensive review of the existing literature on wildlife tourism in protected areas. The authors note that wildlife tourism in protected areas is a rapidly growing industry that can provide economic benefits to local communities and contribute to conservation efforts. However, they also highlight several negative impacts associated with wildlife tourism, including the disturbance of wildlife, habitat degradation, and the displacement of local communities. The article reviews a range of research studies on wildlife tourism in protected areas, covering topics such as visitor motivations, the impacts of wildlife tourism on wildlife and local communities, and the effectiveness of different management strategies.

Researchers [5] describe the process of developing the Android application, which involved collecting a comprehensive database of flora species, including images and relevant information. The authors gathered plant samples from different locations and captured images of their leaves, flowers, and other distinguishing features. These images were then labeled and added to the database, along with the corresponding species information. The developed Android application utilizes image recognition techniques to match user-captured images of plants with the images stored in the database. The application uses an algorithm that analyzes the key features of the input image and compares them with the features of known plant species in the database. Based on the matching results, the application provides the user with the most probable plant species identification..

### **3. TECHNOLOGIES**

#### **ANDROID STUDIO PLATFORM**

Android Studio is an Integrated Development Environment (IDE) used by developers to build Android apps. It was developed by Google and is based on the IntelliJ IDEA platform. Android Studio provides a comprehensive set of tools for building and testing Android applications, including an advanced code editor, code templates, a visual layout editor, a debugger, and an emulator. Here are some key features of Android Studio: Code editor: Android Studio has a powerful code editor that supports features like code completion, syntax highlighting, code analysis, and refactoring. Visual Layout Editor: Android Studio provides a visual layout editor

that allows you to create your app's user interface by dragging and dropping UI elements onto a canvas.

## **FIREBASE**

Firebase is a mobile and web application development platform that was acquired by Google in 2014. It provides a set of tools and services to help developers build better apps, improve user engagement, and grow their businesses. Firebase is widely used by Android developers as a backend solution for their applications.

## **JAVA**

Java is a high-level, object-oriented programming language that was developed by Sun Microsystems in the mid-1990s. It is one of the most widely used programming languages in the world and is commonly used for developing desktop applications, mobile applications, and server-side applications. Object-oriented programming: Java is a fully object-oriented programming language, which means that everything in Java is an object. This makes it easy to write modular and reusable code. Platform independence: Java code is compiled into an intermediate form called bytecode, which can be run on any platform that has a Java Virtual Machine (JVM) installed. This makes Java programs highly portable. Multi-threading: Java provides built-in support for multi-threading, which allows developers to write concurrent programs that can take advantage of multiple CPU cores. Security: Java provides a number of security features, including sandboxing, which allows untrusted code to run safely, and cryptography libraries for secure communication. Rich API: Java provides a rich set of APIs (Application Programming Interfaces) for everything from database access to user interface design.

## **XML**

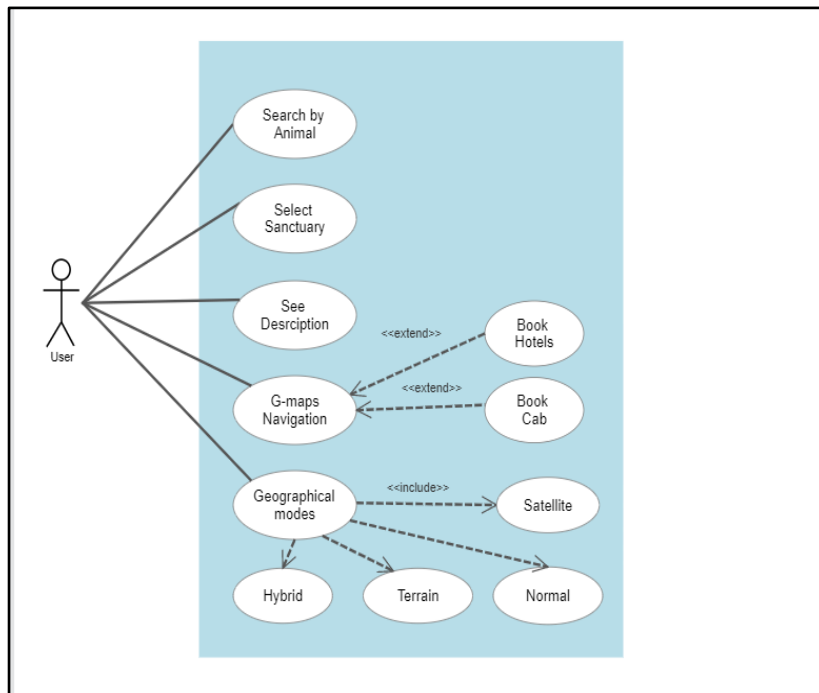
XML (Extensible Markup Language) is a markup language used for storing and transporting data. It was first introduced in the late 1990s as a successor to HTML, with the aim of being a more flexible and extensible standard for describing structured data. Here are some key features of XML: Structure: XML is designed to describe the structure of data, rather than its appearance. XML (Extensible Markup Language) is a markup language used for storing and transporting data. It was first introduced in the late 1990s as a successor to HTML, with the aim of being a more flexible and extensible standard for describing structured data. Portability: XML documents can be read and written by any application that supports XML, regardless of the platform or programming language used. This makes it a popular choice for data interchange between different systems. Validation: XML documents can be validated against a schema or DTD (Document Type Definition) to ensure that they conform to a specific structure and format.

## **4. METHODOLOGY**

### **4.1 USE CASE DIAGRAM**

A use case diagram at its simplest is a representation of a user's interaction with the system and depicts the specifications of a use case. Fig. 1. portray the different types of users of a system and the various ways that they interact with the system. Users can interact with the system using various modules as shown in the fig. 1. such as search by animal, select sanctuary,

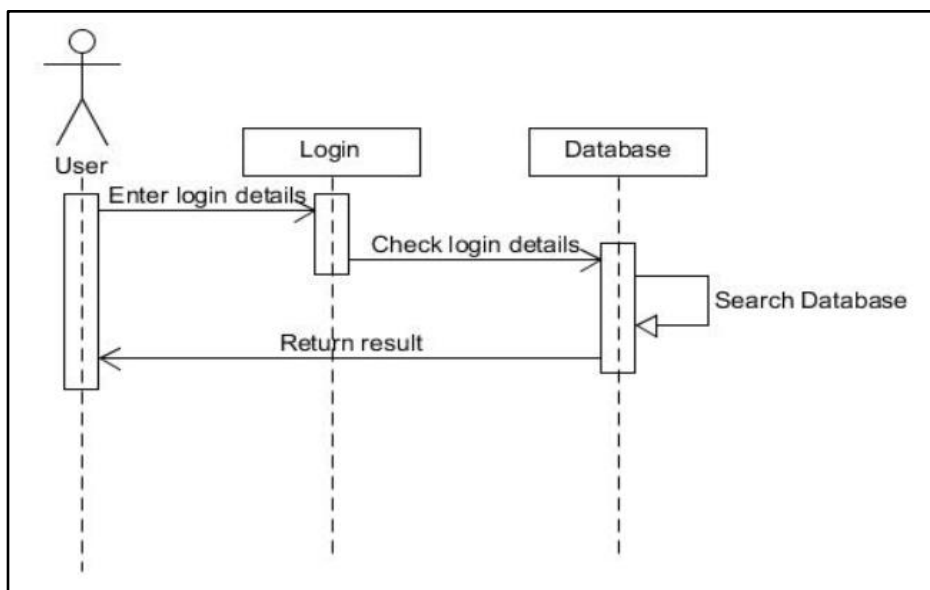
see description, geographical modes and booking hotels as well as cab.



**Figure: 1 Use Case diagram of Wildlife Sanctuary App**

#### 4.2 SEQUENCE DIAGRAM

A sequence diagram is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram shows object interactions arranged in time sequence. Fig. 2. depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario.

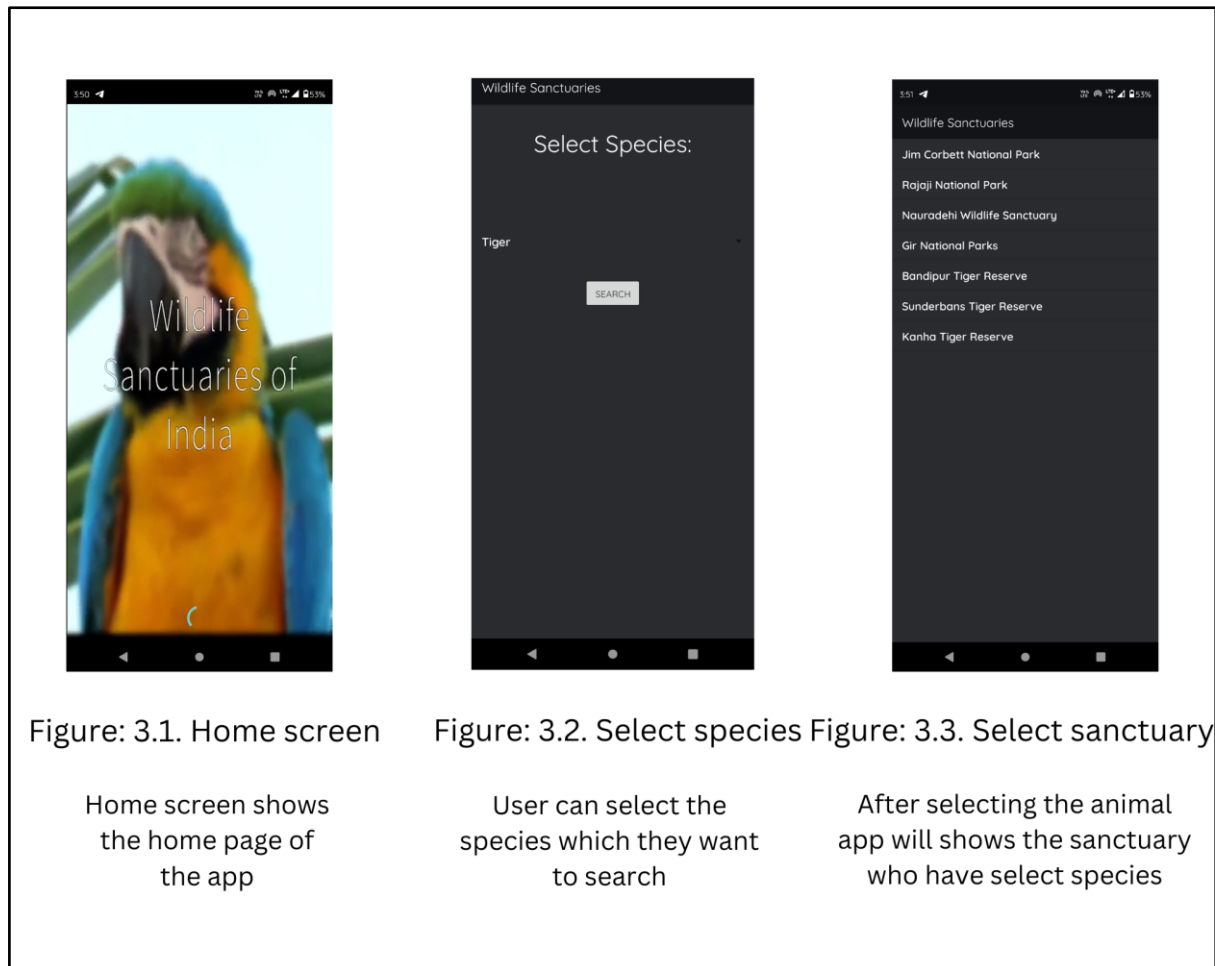


**Figure: 2 Sequence Diagram**

## 5. RESULTS AND DISCUSSIONS

### 5.1 RESULTS

The app does not require any login credentials. The app is capable of working on Android OS 6 and above. This app is useful for tourists in India who want to travel to the sanctuary or anyone who wants to learn more about the wildlife sanctuaries in India. After opening the app user will come across the home screen, user can select the species and search after that he will get all the available sanctuaries within India that have that particular animal along with that we have also added other features such as book hotels and book cab. Following are the modules present in the app.



**Figure: 3 Figures representing Home screen, select species and select sanctuary**



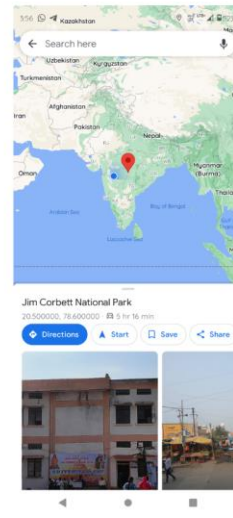
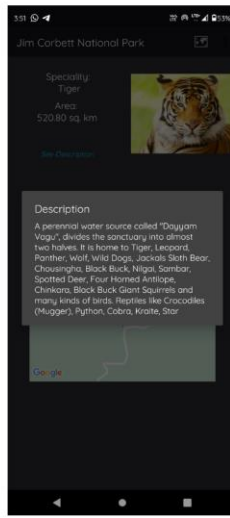
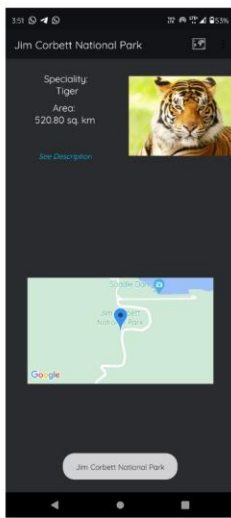


Figure: 4.1. Species details    Figure: 4.2. Description    Figure: 4.3. Maps navigation

After selecting the sanctuary it will shows the output along with the photo of animal

User can see the description about the sanctuary and information

Map navigation features for tourist to reach the sanctuary

**Figure: 4** Figures representing species details, description and map navigations

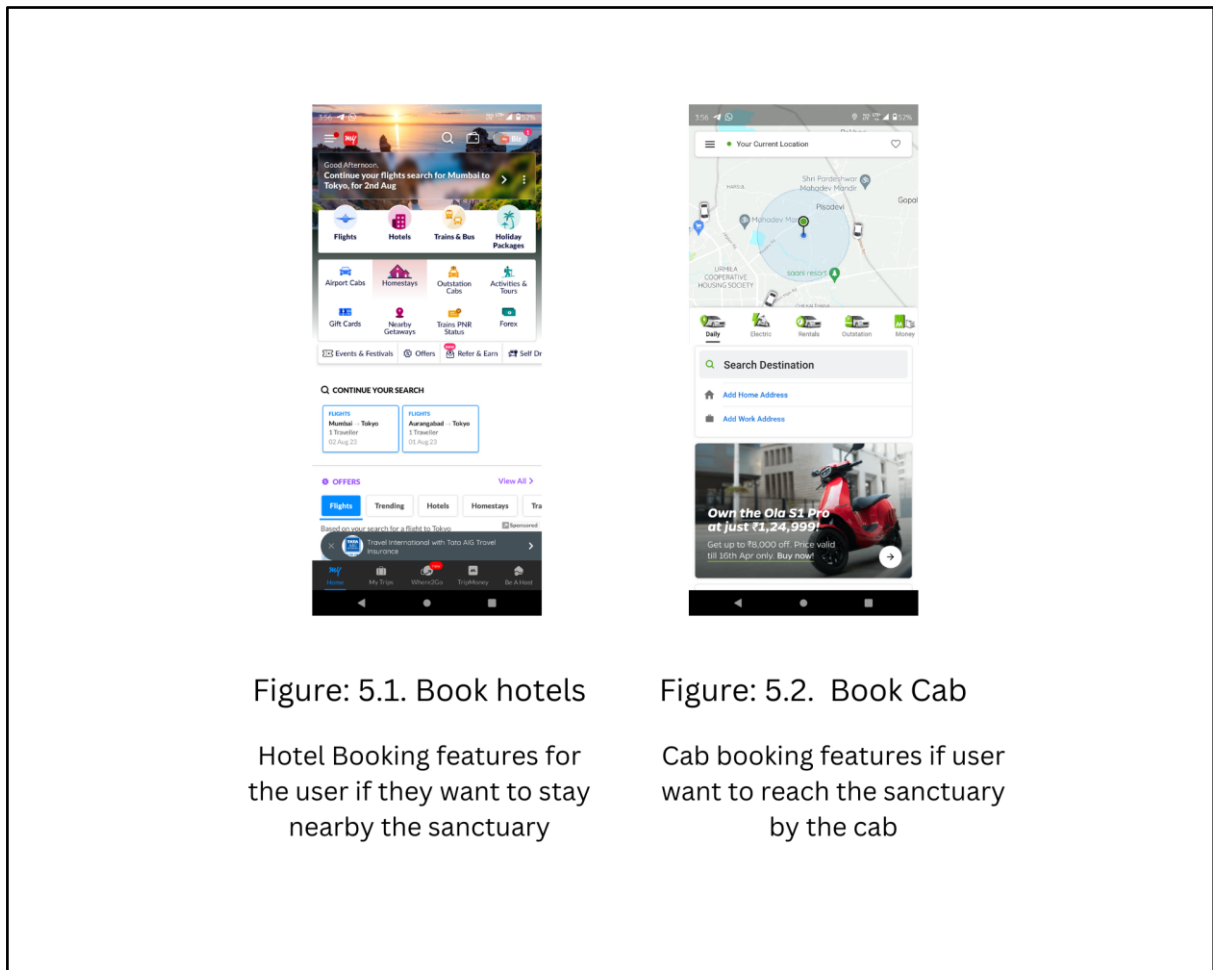


Figure: 5.1. Book hotels

Hotel Booking features for the user if they want to stay nearby the sanctuary

Figure: 5.2. Book Cab

Cab booking features if user want to reach the sanctuary by the cab

**Figure: 5 Figures representing book hotels and book cab**

## 5.2 DISCUSSION

Wildlife sanctuaries face several threats that undermine their effectiveness in conserving and preserving biodiversity. The threats to wildlife sanctuaries include:

**Habitat loss and fragmentation:** Habitat loss and fragmentation threaten the survival of wildlife by reducing the available space for animals to live and breed.

**Poaching and illegal wildlife trade:** Poaching and illegal wildlife trade threaten the survival of endangered and threatened species.

**Human-wildlife conflicts:** Human-wildlife conflicts arise when wildlife encroaches on human settlements, leading to conflicts between people and animals.

**Climate change:** Climate change threatens wildlife sanctuaries by causing changes in weather patterns, which may disrupt breeding and migration patterns.

India is home to a diverse range of national parks and wildlife sanctuaries that are critical for the conservation of wildlife and the preservation of natural ecosystems. Here are some of the most popular national parks and wildlife sanctuaries in India and the count of species found in them:

- **Kanha National Park:** Kanha National Park is located in the state of Madhya Pradesh and is one of the largest national parks in India. It is home to a wide variety of wildlife



species, including tigers, leopards, Indian bison, and deer. The park has a recorded count of 22 species of mammals, 300 species of birds, and 120 species of butterflies.

- Bandhavgarh National Park: Bandhavgarh National Park is another popular national park in Madhya Pradesh and is known for its high density of tigers. Other wildlife species found here include leopards, Indian bison, and deer. The park has a recorded count of 22 species of mammals, 250 species of birds, and 70 species of butterflies.
- Jim Corbett National Park: Jim Corbett National Park is located in the state of Uttarakhand and is the oldest national park in India. It is known for its population of Bengal tigers and also houses a wide variety of other wildlife species such as elephants, leopards, and deer. The park has a recorded count of 50 species of mammals, 580 species of birds, and 25 species of reptiles.
- Sariska National Park: Sariska National Park is located in the state of Rajasthan and is known for its population of Bengal tigers. Other wildlife species found here include leopards, hyenas, and deer. The park has a recorded count of 25 species of mammals, 200 species of birds, and 30 species of reptiles.
- Periyar National Park: Periyar National Park is located in the state of Kerala and is known for its population of elephants. Other wildlife species found here include tigers, leopards, and deer. The park has a recorded count of 35 species of mammals, 265 species of birds, and 45 species of reptiles.
- Gir Forest National Park: Gir Forest National Park is located in the state of Gujarat and is the only place in the world where Asiatic lions are found. Other wildlife species found here include leopards, hyenas, and deer. The park has a recorded count of 38 species of mammals, 300 species of birds, and 37 species of reptiles.
- Kaziranga National Park: Kaziranga National Park is located in the state of Assam and is known for its population of one-horned rhinoceroses. Other wildlife species found here include tigers, elephants, and deer. The park has a recorded count of 35 species of mammals, 480 species of birds, and 42 species of reptiles.

These are just a few examples of the many national parks and wildlife sanctuaries in India that are critical for the conservation of wildlife and the preservation of natural ecosystems.

## **6. CONCLUSION**

It is concluded that the app works well and satisfies the users. The app is tested very well and errors are properly debugged. Users can search by selecting any specific animal and sanctuary. This app will provide information about Indian sanctuaries that have animals that are almost on the verge of extinction. The app shows the description of the specific, its specialty, and its area in square feet. Given the variety of geographical modes such as satellite, terrain, hybrid, and normal for those with a keen interest in sanctuary areas and their geographical modes. Map navigation is the most important feature which helps the user to navigate through google maps and directions to reach their desired sanctuaries. A very special feature of booking nearby accommodation for the tourist as well as cabs for touring is also provided in the app. The app also provides different functionality. Further enhancements can be made to the application so that the application functions in a more attractive and useful manner than the present one. The speed of the usage has become enough now.

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