



# INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

## ELECTRIC VEHICLE RECHARGE AT NEAREST BUNK USING WEB APPLICATION

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### Abstract:

We are living in the 21st century where all the work is done using technology and has become an integrated part of life. In this article, we proposed the design and implementation of an electric vehicle (EV) charging station finder application developed in the Kotlin language. Due to the limitation of the electrical power distribution network, Electric Vehicles' charging stations are limited, and finding them is hard for new EV owners. In order to provide information to users about the charging stations and to help user to navigate, it was also created a mobile application to help EV owners with these processes. This Proposed Electric vehicle recharge at the nearest bunk using a web application helps EV owners to locate a charging station near them and to plan a journey with many features.

**Words to Know:** Kotlin, In-Built Map, Navigation

### 1. Introduction:

As of now electric charging stations are limited in India and people can't find the right charging station which will save them time and money. EV charging stations require space like parks, malls, and societies. For private and semi-public charging stations, this space is available in the parking areas of the societies, apartment buildings, or of commercial or public or institutional areas. Due to this, there is more difficult for EV owners to find charging stations nearby them. The problem is not only finding the charging station but also charging it quickly because of the time required to charge the EVs. This leads to the inconvenience of EV users as requires a lot of time

so need of slot booking is required in charging the use of EVs. As the electric vehicle industry is growing in India and fewer charging stations are available in India and also new registrations of the charging station are growing so there is no availability of this growing charging station on virtual Maps. This leads to the inconvenience of the user in finding a charging station virtually. When a customer buys an electric car, the maintenance of these cars is not like ordinary cars. One has to seek some help such as an Electric vehicle recharge at the nearest bunk using a web application to find charging stations. An electric vehicle recharge at the nearest bunk using a web application can save us time to find this charging station rather than search independently. One cannot find charging stations like petrol or diesel or CNG station which are available everywhere. Due to this problem, we have to plan the re-fueling (charging) of these cars, but with the help of our apps which directly navigate us to nearby EV charging stations. In this article, we will be going through every aspect of an Electric vehicle recharge at the nearest bunk using a web application. An Electric vehicle recharge at the nearest bunk using a web application will show the nearby location of charging across stations across our locality as well as nearby your destination. The app provides real-time availability of the stations, photos of the stations, and the cost of charging of the car at the station. The users can contribute to the app also by adding a new electric vehicle charging station as they discover. In this project, we will design and develop an app that will find nearby charging stations in the user's locality. The app will show all nearby electric vehicle charging stations. The user can directly navigate to these charging stations. This app will provide a facility for booking slots for charging the Electric vehicle of the users based on the type and charging port of their vehicle in

their convenient time slots. This app will save a lot of time for Electric vehicle owners. In this project, we will develop an app that will be helpful for Electric charging station owners (Vendors) also. This app will give all booking of users for charging their vehicles at the vendor station. This app will provide a comfortable and easy-to-use interface for users as well as for vendors.

## 2. Technology used:

In this section, we will study various software parts that were used while designing this application.

**Kotlin:** Kotlin is used to build native Android apps. Kotlin is used for many different kinds of application developments on the server-side, android application, and on the client-side web. With Kotlin, one can work natively and can support other platforms such as systems that are embedded, in Mac-OS. Kotlin introduces improved syntax and abstractions. Kotlin application development is faster to compile and prevents apps from increasing in size. Code written in Kotlin is smaller compared to Java, which means fewer bugs. Kotlin includes coroutines and interoperability with JavaScript for web development. Adopting Kotlin is free and switching from Java to Kotlin is simple, just by installing the Kotlin plugin and adding to the Gradle build files. Interoperable with Java. Kotlin is safe against Null Pointer Exceptions. Gained a lot of traction in Android development, but can also be used in backend projects like Spring 5. Developers can benefit from the Anko library and over 2000 Kotlin projects on GitHub. Supports smart extensions to build APIs. Configures projects in Android Studio for auto-completion aids, and helps in detecting compile-time errors. Fewer app crashes compared to Java. Reduced project timelines.

**Google Play Services:** Google Play services provide a large set of SDKs on Android to help us to build our app, increase privacy and security, engagement of the users, and grow your apps. These SDKs are unique. These libraries require a thin client library to be included in our app. At runtime, the client library communicates with the packages of the SDK's implementation and footprint in Google Play services.

**Google Maps API:** It is a set of APIs (application programming interfaces) that provide the communication bridge to Google's various services. It will help us to build simple Android, and iOS apps to very complex apps which are based on real-time location for Android, web, and iOS.

**Google Place API:** The Places API (application programming interface) is a service that provides information about places using HTTP requests. Prominent points of interest like establishments or geographic locations are referred to as places in these areas.

**Google Direction API:** It is a set of APIs (application programming interfaces) that provide the communication bridge to Google's various services. It provides to navigate to the destination from the source. It will help us to build simple

Android, and iOS apps to very complex apps which are based on real-time location for Android, web, and iOS.

## 3. Impact:

Scheduled charging takes all its importance when you consider that on average, a car is parked 96 percent of the time. Of course, we could just plug it in and leave it charging whenever we are at home, but doing so is disadvantageous for our wallet and our car's battery.

Indeed, many utility providers offer cheaper off-peak prices at times when electricity demand is lower, such as at night or during the weekend. Scheduling our charging during these times allows us to save considerably in the long run.

By scheduling charging at specific times, we can take advantage of off-peak prices, depending on our location, energy provider, and contract. These are used to incentivize consumers to shift their energy demand to quieter times, when there's less pressure on the grid, and are usually available at night and during the weekend. Regularly charging our EV during these quiet times can save considerable amounts.

## 3. Conclusion:

Charging stations are limited in India and people can't find the right charging station which will save them money and time. Our app will be more interactive and more efficient as we get more data on electric vehicle charging stations. The user can book the slots according to his wish. The user will have the easiness to navigate directly to the booked station. This will increase the business of the vendor also. Our application provides electric vehicle owners the convenience of locating charging stations and booking the slots whenever needed. We have other features like getting booking history, payment options, advisory recommendations, and payment rewards.

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