

Project Report
ON
"KhojYantra 2.0"

**Submitted for partial fulfillment of the Degree of Bachelor of
Engineering in Computer Engineering awarded by
Pokhara University**



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**DEPARTMENT OF COMPUTER ENGINEERING
POKHARA ENGINEERING COLLEGE**

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CERTIFICATE

Date: 2022-06-28

This is to certify that the project entitled "**KhojYantra 2.0**" has been carried out by Arun Bhandari (18070175), Biraj Aryal (18070182), Nischal Poudel (18040427) and Sanjok Gurung (18070201). These students of 8th semester B.E (Computer) has successfully completed the project for the partial fulfillment of the Degree of Bachelor of Engineering in Computer Engineering of Pokhara University.

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The project would not have been successfully completed without the whole-heartedly dedication and devotion from each of our project member. The members were very dedicated towards the project and surrender their vital time to accomplish the project within the schedule time by sharing knowledge about different aspect to make the project efficient and effective to use.

We would like to acknowledge our gratitude our seniors and our honorable teachers who had accelerated and encouraged us during the development of the project by giving conceptual view for which we had no experience. Also, like to thank our Head of Department and other faculty members of computer in vigorous support and kind guidance. We want to thank all our friends and people who directly or indirectly assisted us in our work until the completion of our Project.

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ABSTRACT

The project has been developed to fulfill the course, “Major Project” for Bachelor Degree in computer engineering in Pokhara University. It has been submitted to Computer and Electronics department of Pokhara Engineering College.

This is a web application named “**KhojYantra 2.0**”, built with the motive of tracking as many as lost devices we can. Our application uses python, C++, JavaScript programming language and uses pyqt5 for UI design. Our application uses Sqlite3 as a database. Our application also uses Arduino, Gsm Module and Gps module for vehicle tracking.

From project "**KhojYantra 2.0**" our motive is to develop a location tracking system KhojYantra, which provides the public an online device location tracking interface. This will be the boon for tracking down stolen vehicles and lost gadgets. Police can make great use of this app while searching for those lost essentials. Instead of using traditional interrogation methods, this way of searching will definitely ease the search and optimize the time.

CHAPTER 1

INTRODUCTION

1.1 Background

Technology is also the backbone of every nation. Technology can play a very crucial role in streamlining the whole system of our daily life. Now a day's Technology rapidly grows day by day. During this time many devices are sometimes lost, forgotten, or stolen day by day. Devices lost/forgotten/stolen is not a big deal but the data that is stored under a device is more and more of a big deal because the data is everything for a public nowadays. So, we developed a "**KhojYantra 2.0**" to track a device like mobile, arduino, laptop etc. We aim to develop a location tracking system "**KhojYantra 2.0**", which provides the public an online device location tracking interface.

In 21st century, Data and device is everything for public. Data and device are very inter-related to each other like mobile, laptop, password etc. This project is developed using the framework of Python i.e., Django. HTML and CSS is used for the front end while database will be designed using SQLite3.

1.2 Project Category

"**KhojYantra 2.0**" is a web application.

A web application is a software application running on the Desktop platform. Because the web platform is built for laptop/mobile/arduino devices, a typical web app is designed for a smartphone or a tablet PC running on the desktop. The system requirement for this application is really low so it can work even in the weak devices.

1.3 Detailed Problem Definition

Nowadays, many people face the problem of getting their devices lost or stolen. They face many problems like loss of data, time, money etc. Our project “**KhojYantra 2.0**” helps people to track their lost devices. Our project will have web user interface for the users to easily track their lost devices.

1.4 Objective of the Project

The Project aims: -

To provide online location tracking interface.

1.5 Scope

The scope of the application generally depends upon successful implementation of the UI and features.

The UI is very user friendly as every single control in the application has label pointing out its function.

The key feature is to online location tracking the stolen, forgetting and stolen device.

1.6 Organization of the Report

The report starts with the first page including the supervisor and the related department it is submitted to Department of Computer Engineering, Pokhara Engineering College. Then the next page includes “certificate” and “Acknowledgement” which is followed by “Page Index”, “Figure Index”, “Abstract”.

This report has been written in chapters for more convenience where the First Chapter is “Introduction” which gives the background, problem definition, objectives and scope of the project.

The Second Chapter is “Analysis” that provides the project management details including the initial investigation, feasibility analysis, cost benefits analysis and requirement analysis.

The Third Chapter is concerned with the “Design” which indicates the software requirement as well as risk analysis of the project.

The “System Modeling” is explained in the Fourth Chapter along with the Entity Relationship Diagram, Flow chart. The Fifth Chapter provides the significant coding that is used for development of the project, including the details of hardware and programming languages used and finalization of the report. After this theory part, the next page is “Limitation & Recommendations” followed by “Conclusion” and “Bibliography” while the “Appendices” concludes the entire project.

CHAPTER 2

ANALYSIS

2.1 Project Management

The management of this project includes the initial investigation, various analysis design implementation, evaluation and modification of the project. For the proper management of the project we took the following steps: -

2.1.1 Feasibility Analysis

It is the way of study whether the application is suitable or not within its budget, client and so on. From this study, we can determine if the targeted scope can be met or not.

- **Technical Feasibility**

This project is technically feasible because the technical equipment required for the development of this project is easily available. SQLite3 have been used for the designing, developing and database design. Database design is to point proper requirement analysis. Graphical Interface for the user is also easy to understand. Python, JavaScript, C/C++ is used for Programming. Therefore, the project is technically feasible.

- **Economic Feasibility**

For the development of the proposed application, we have used development kits which are available very cheap. The cost of building the Arduino device was also quite affordable. Visual studio code, Arduino IDE, GUI, and geolocation are used. As there is no any genuine expense for the development of the applications, the project is feasible from economic point of view.

- **Legal Feasibility**

Since it does not violate any copyright rules or any form of written laws, it makes our project a legally feasible one.

2.1.2 Cost Benefit Analysis

The project related costs are:

- Cost of application software
- Hardware Cost
- Internet usage cost
- System testing cost
- Printing and document
- Transportation

2.2 Requirement Analysis

"**KhojYantra 2.0**" is a desktop application. No powerful engine is required to run the software as they do not contain any graphically intensive UI nor do they contain extremely complex Arithmetic and Logic calculations. The hardware parts required for this project were available in the market.

CHAPTER 3

DESIGN

3.1 Project Requirement Specification

The software needed for our application is PyCharm IDE, Visual Studio Code, Arduino IDE and SQLite3 for database design.

3.2 System Specifications

A) Hardware Requirement

- Arduino Nano
- SIM 800L GSM Module
- NEO 6M GPS Module
- LM2596 DC-DC Buck Converter
- 18650 3.7V LI-ION Batteries

B) Software Requirement

- Django Server, Pyqt5 & Kivy Framework

3.3 Risk assessment

Software risk is the potential error that may occur in the application in the future. It is the uncertain irrelevant future occurrence or happening. Based on the characteristics like uncertainty and loss, software risk can be categorized as project risk, technical risk and business risk. Beside that software risk can also be categorized as known risk, predictable risk, and unpredictable risk.

The risk in the application may be that in the future, the user might end up doing something, which we, the developers didn't account for. This might cause a new exception which won't be handled and the program will exit.

CHAPTER 4

SYSTEM MODELLING

4.1 Entity Relationship Diagram

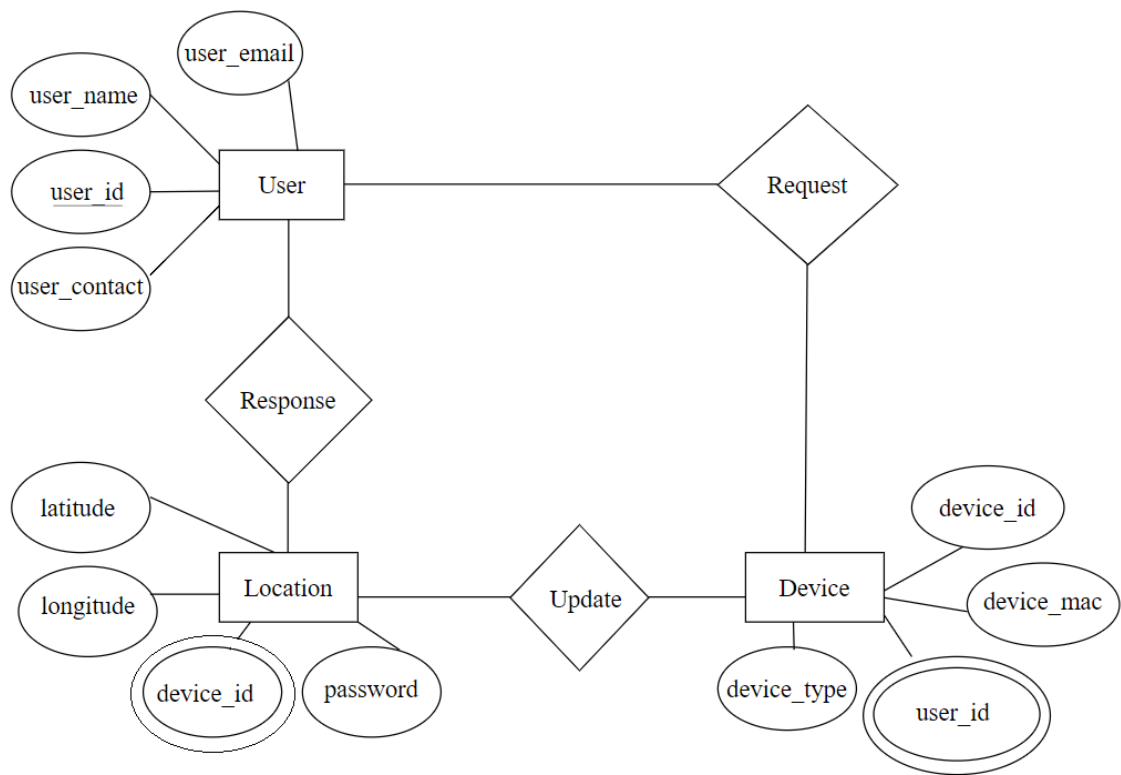


Figure 4.1: Entity Relationship Diagram

4.2 Flow Chart

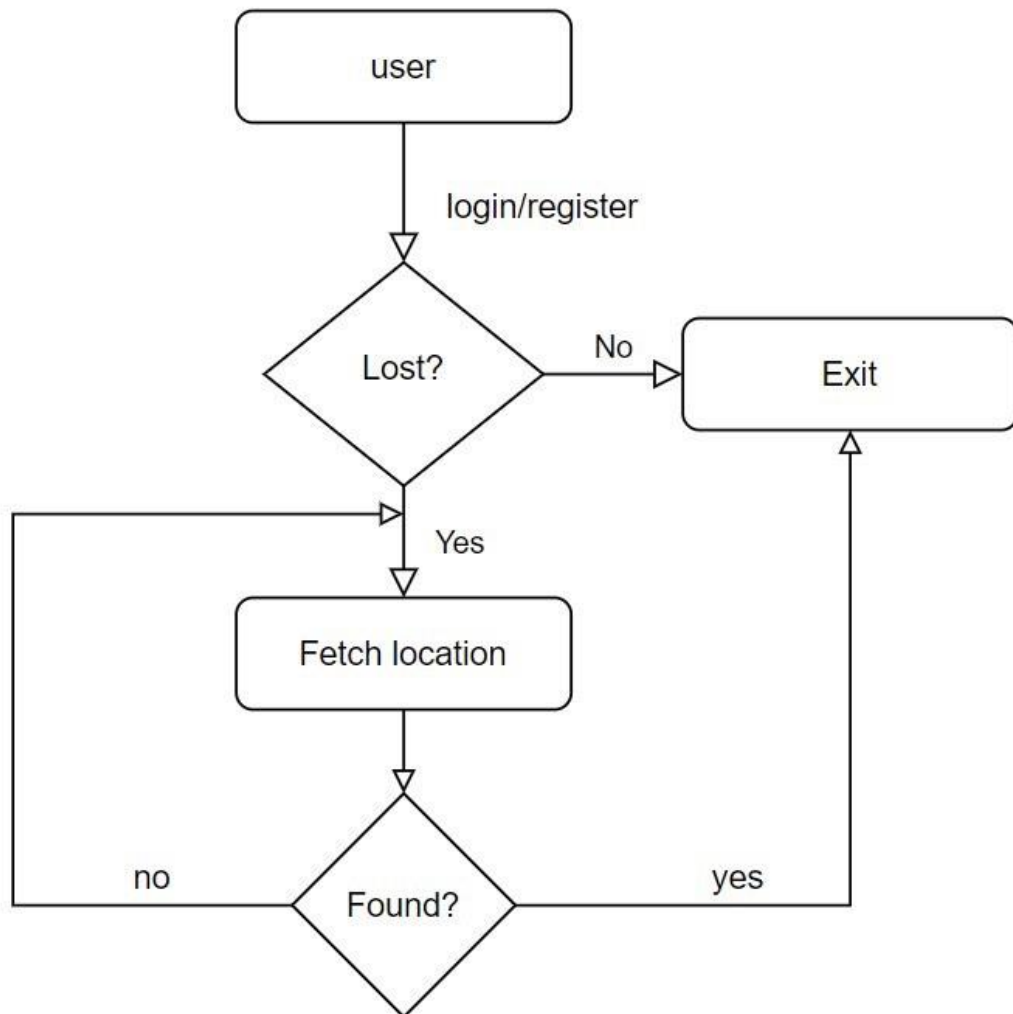


Figure 4.2: Flow Chart

4.3 Use Case Diagram

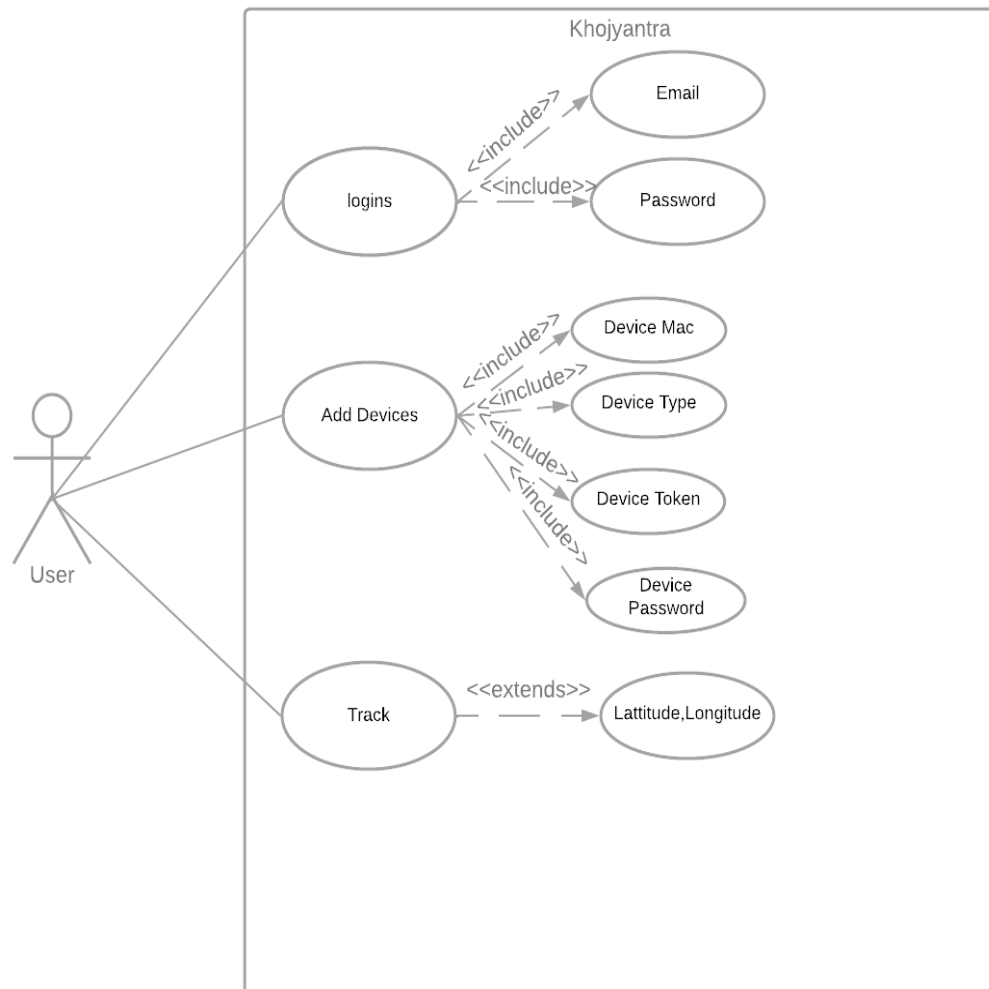


Figure 4.3: Use Case Diagram

4.4 Circuit Diagram

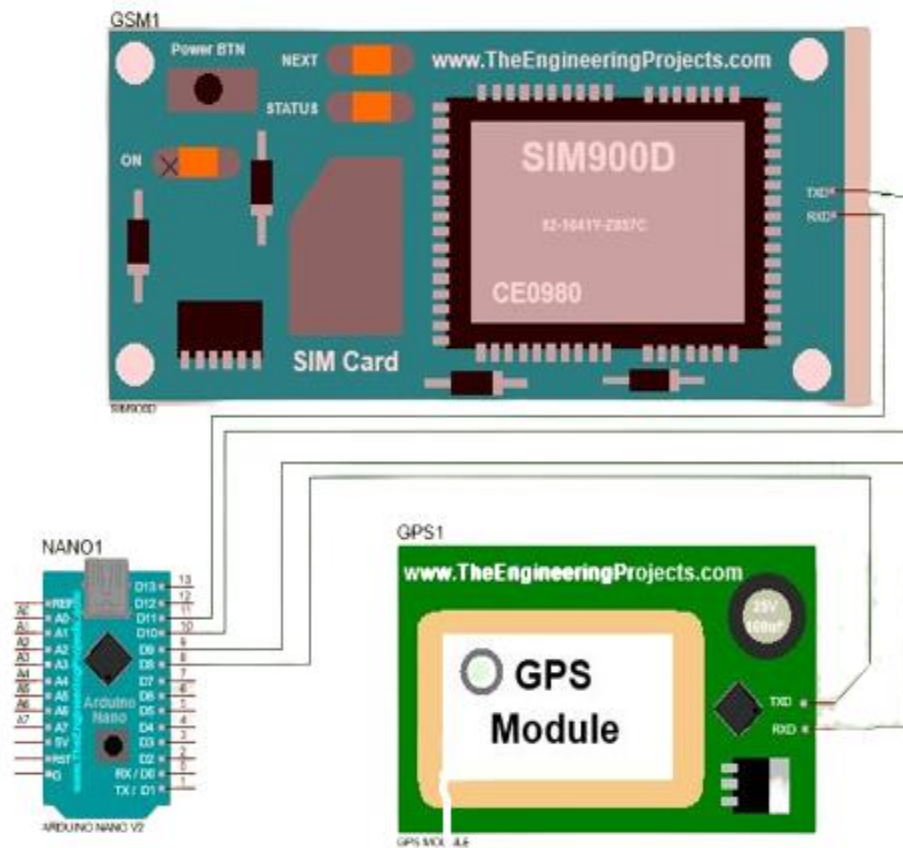


Figure 4.4: Circuit Diagram

CHAPTER 5

CODING

5.1 Platform

Our project is based on Web platform.

5.2 Programming Language Used

- Python

Python is a powerful general-purpose programming language. It is used in web development, data science, creating software prototypes, and so on. Fortunately for beginners, Python has simple easy-to-use syntax. This makes Python an excellent language to learn to program for beginners.

- C++ for Arduino

The Arduino Programming Language is basically a framework built on top of C++. You can argue that it's not a real programming language in the traditional term, but I think this helps avoiding confusion for beginners.

A program written in the Arduino Programming Language is called sketch. A sketch is normally saved with the “.ino” extension (from Arduino).

- PyQt5 for Desktop App & Kivy and Plyer for mobile app development.

5.3 Software Tools Used

- Visual Studio Code
- Arduino IDE
- PyCharm IDE
- Postman for API testing

- Visual Studio Code

Visual Studio Code is a source-code editor developed by Microsoft for Windows, Linux and MacOS. It includes support for debugging embedded Git control and GitHub, syntax highlighting, intelligent code completion, snippets, and code refactoring. It is highly customizable, allowing users to change the theme, keyboard shortcuts, preferences, and install extensions that add additional functionality.

- Arduino IDE

Arduino is an open-source hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices.

- PyCharm

PyCharm is a dedicated Python Integrated Development Environment (IDE) providing a wide range of essential tools for Python developers, tightly integrated to create a convenient environment for productive Python, web, and data science development.

CHAPTER 6

TESTING

6.1 Test Plan

Manual testing is inefficient and doesn't scale. Test designs are used to reuse and improve our application efficiency. So, we have done testing as unit test, integration testing, black-box and white box testing, and system testing as a whole.

6.2 Test cases and Test Results

Following tests were done to make sure that the application works in all scenarios and does not cause problem while running:

Table 6.1: Testing Activities and Testing Result

S.N.	Testing Activities	Results
1.	Login with authorized account.	Passed
2.	Add devices	Passed
3.	Locate devices	Passed
4.	Display device on map	Passed
5.	Delete device from database.	Passed
6.	Update device location	Passed

CHAPTER 7

LIMITATIONS

7.1 Limitations

1. This application does not run without internet.
2. Misuse of the app
3. This application does not work if the device is turned off or device is reset.

CHAPTER 8

CONCLUSION

The project is done using PyCharm IDE, Visual Studio Code IDE and Arduino IDE. The libraries and frameworks used are Django Framework for Web Development, PyQt5 for Desktop Application Development and Kivy and KivyMd for Android Application Development. This project is built in order to provide easy and reliable location tracking service to the Users. Our GPS tracking device is easy to install inside Vehicles and other items. Overall, our project fulfills our objective, which is to help people track their lost devices.

CHAPTER 9

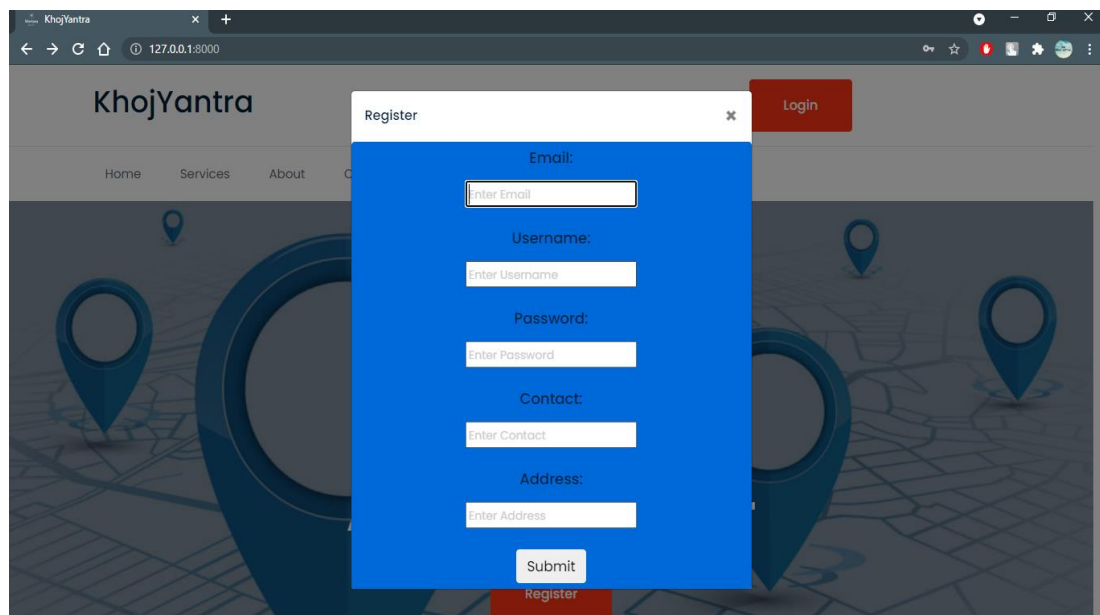
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- KivyMD 1.0.0.dev0 documentation. (n.d.). Retrieved July 13, 2022, from <https://kivymd.readthedocs.io/en/latest/>

Appendix – A: Home page of Website



Appendix – B: Register of Website

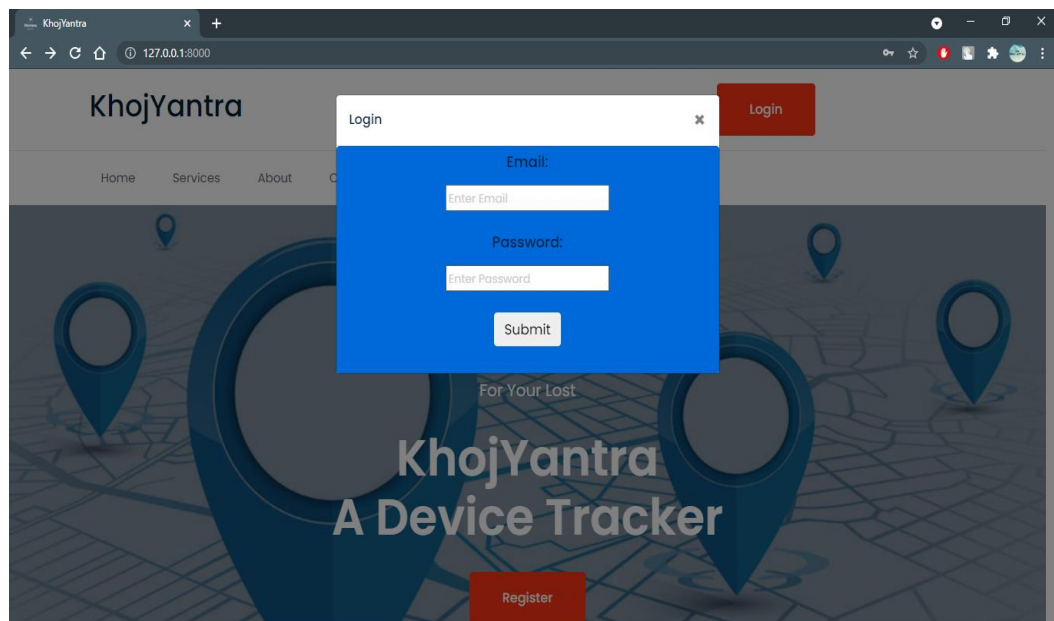


The image shows a web browser window displaying the 'KhojYantra' website. A 'Register' modal form is open in the center. The form has a blue background and contains the following fields and buttons:

- Email:** A text input field with the placeholder 'Enter Email'.
- Username:** A text input field with the placeholder 'Enter Username'.
- Password:** A text input field with the placeholder 'Enter Password'.
- Contact:** A text input field with the placeholder 'Enter Contact'.
- Address:** A text input field with the placeholder 'Enter Address'.
- Submit**: A white button with a blue border.
- Register**: A red button located at the bottom of the modal.

The background of the website shows a map with location pins and a large blue circular graphic. The browser's address bar shows the URL '127.0.0.1:8000'.

Appendix – C: Login Page of Website



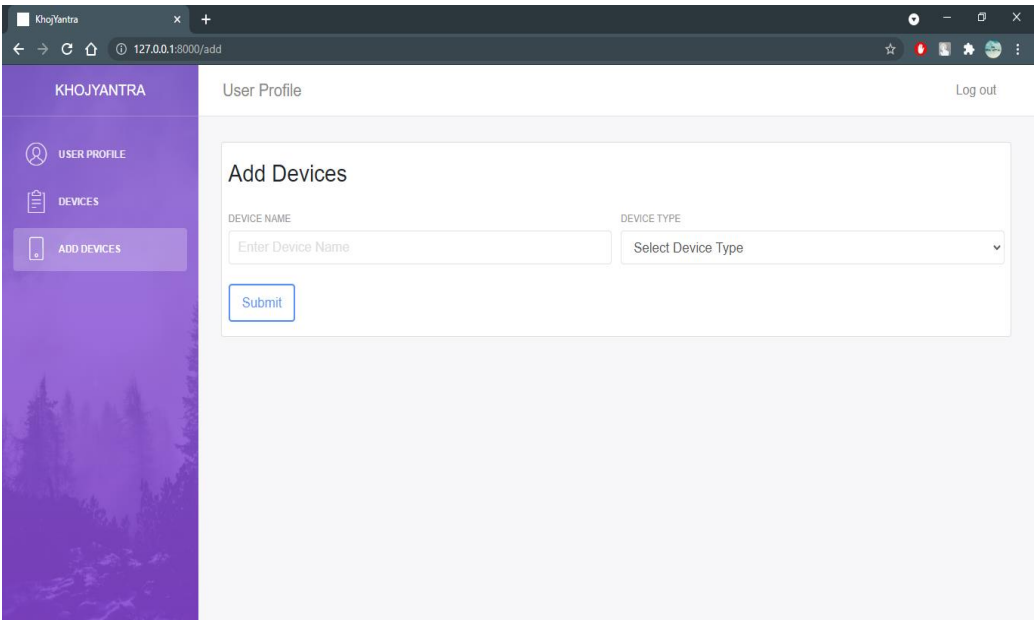
Appendix – D: Profile Page of Website

The screenshot shows a web browser window with the address bar displaying "127.0.0.1:8000/dashboard". The page title is "KHOJYANTRA". The left sidebar is purple and contains the following menu items: "USER PROFILE" (selected), "DEVICES", and "ADD DEVICES". The main content area is titled "User Profile" and includes a "Log out" link. Below the title is a form titled "Edit Profile" with the following fields:

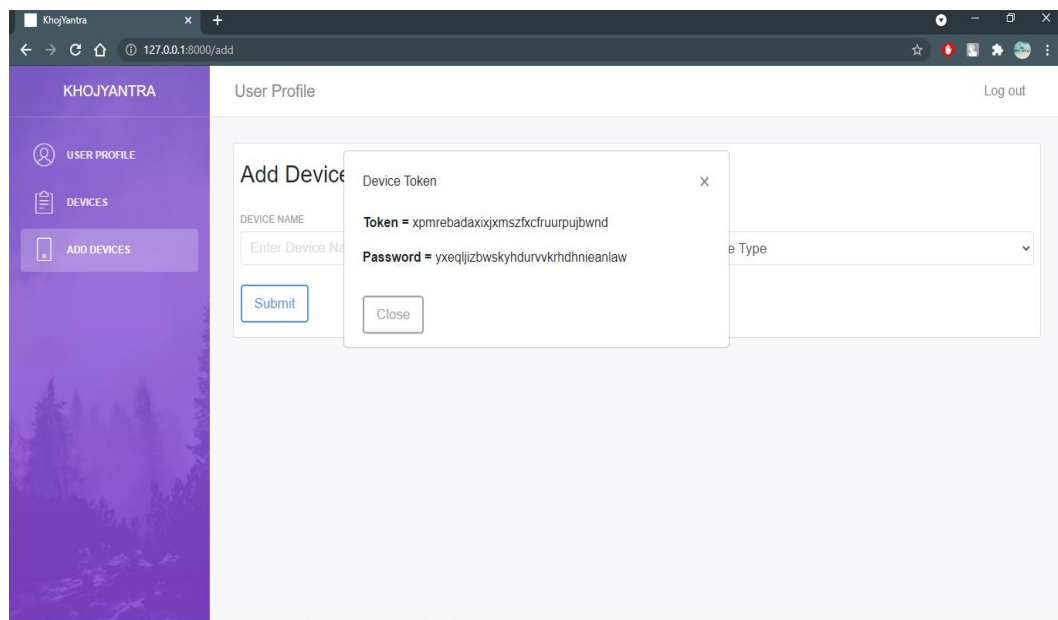
- USERNAME: Nischal Poudel
- EMAIL ADDRESS: nischal@gmail.com
- CONTACT NO: 9876543211
- ADDRESS: Pokhara

An "Update Profile" button is located at the bottom right of the form.

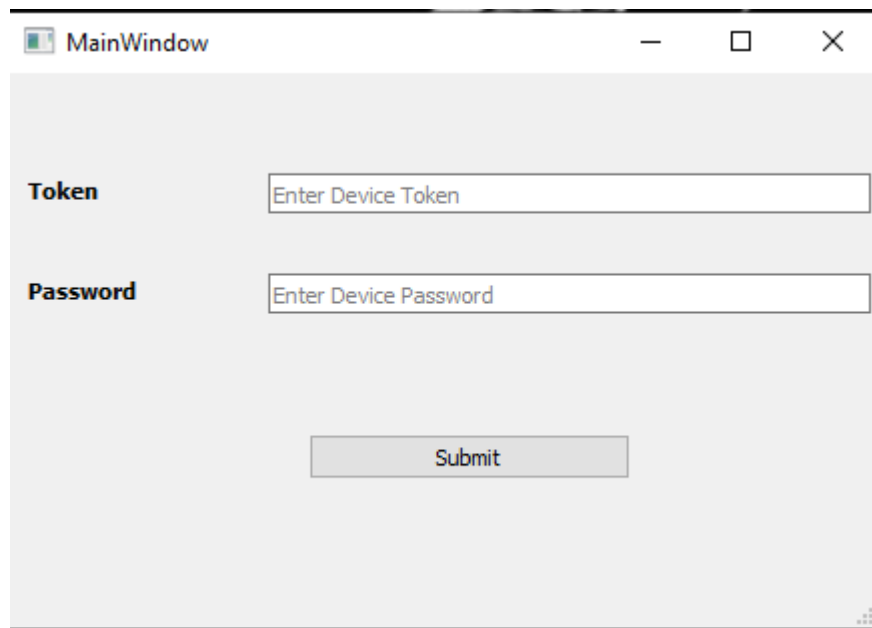
Appendix – E: Add new device Page



Appendix – F: Generate token and password page



Appendix – G: Desktop app



The image shows a screenshot of a desktop application window titled "MainWindow". The window has a standard Windows-style title bar with minimize, maximize, and close buttons. The main content area is light gray and contains two input fields. The first field is labeled "Token" and has the placeholder text "Enter Device Token". The second field is labeled "Password" and has the placeholder text "Enter Device Password". Below these fields is a "Submit" button. The window is centered on the screen.

Token	Enter Device Token
Password	Enter Device Password
Submit	

Appendix – H: Desktop App Background Process

Task Manager

File Options View

Processes Performance App history Startup Users Details Services

Name	Status	8% CPU	84% Memory	1% Disk	0% Network
> Intel® SGX Application Enclave ...		0%	0.1 MB	0 MB/s	0 MB/s
> IntelCpHeciSvc Executable		0%	0.6 MB	0 MB/s	0 MB/s
Internet Download Manager (ID...		0%	2.9 MB	0 MB/s	0 MB/s
loc.exe		0%	16.0 MB	0 MB/s	0 MB/s
loc.exe		0%	0.8 MB	0 MB/s	0 MB/s
Microsoft Application Virtualiza...		0%	0.1 MB	0 MB/s	0 MB/s
Microsoft Malware Protection C...		0%	0.4 MB	0 MB/s	0 MB/s
> Microsoft Network Realtime Ins...		0%	8.5 MB	0 MB/s	0 MB/s
> Microsoft Office Click-to-Run (S...		0%	6.2 MB	0 MB/s	0 MB/s
Microsoft Office SDX Helper		0.1%	4.0 MB	0 MB/s	0 MB/s
Microsoft OneDrive		0%	10.3 MB	0 MB/s	0 MB/s
> Microsoft Text Input Application		0%	4.9 MB	0 MB/s	0 MB/s
> Microsoft Windows Search Inde...		0%	33.9 MB	0 MB/s	0 MB/s
MoUSO Core Worker Process		0%	52.7 MB	0 MB/s	0 MB/s
MultiPlayManager.exe (32-bit)		0.6%	0.7 MB	0 MB/s	0 MB/s

< >

^ Fewer details End task

Appendix – I: Devices shows page

KHOJYANTRA

Devices [Log out](#)

[USER PROFILE](#)

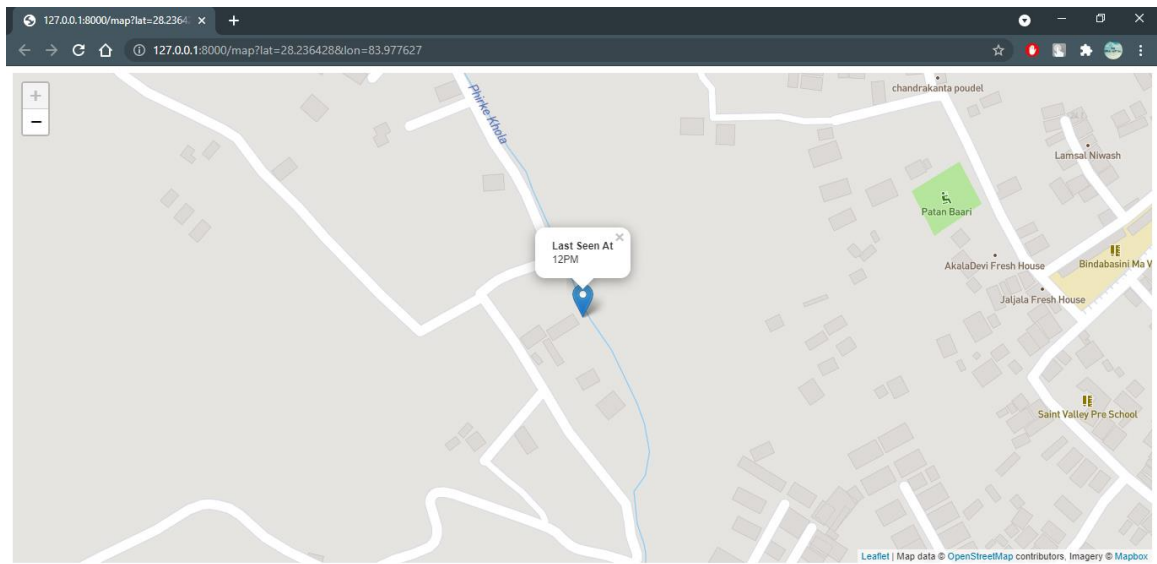
[DEVICES](#)

[ADD DEVICES](#)

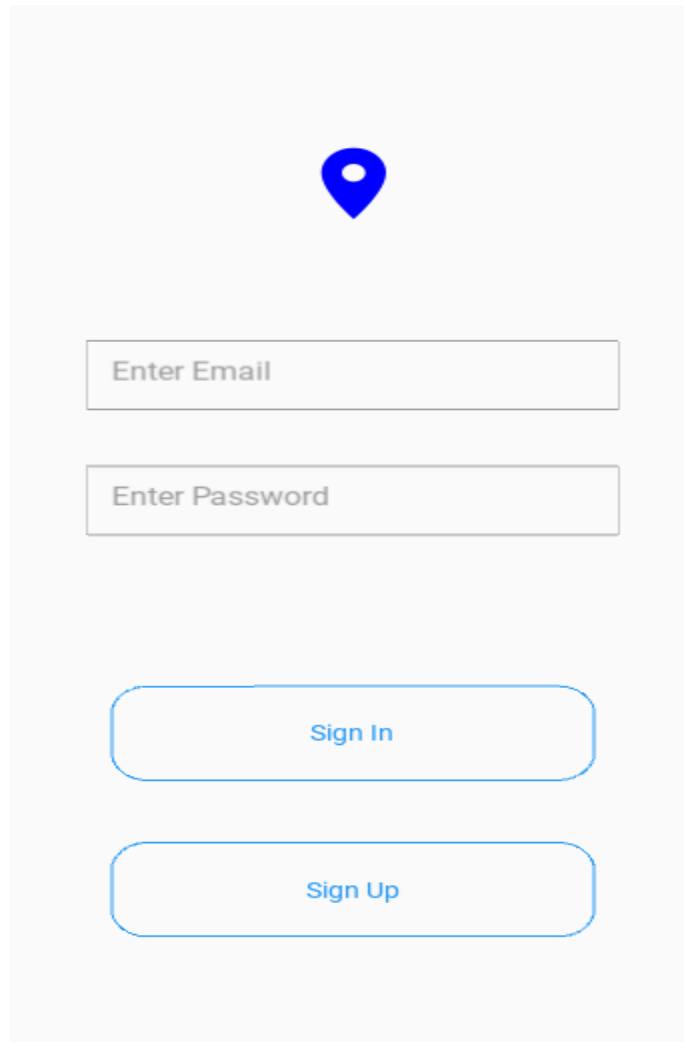
Find Devices

DEVICE NAME	DEVICE TYPE	DEVICE MAC	LAST LOCATION	FIND
arun laptop	Laptop	d8:0f:99:7f:bd:b1	Device Mac	Track
biraj laptop	Laptop	d8:0f:99:7f:bd:b1	Device Mac	Track
nischal laptop	Laptop	d8:0f:99:7f:bd:b1	Device Mac	Track


Appendix – J: Track location of Device



Appendix – K: Mobile App Login Screen



A mobile app login screen with a light gray background. At the top center is a blue location pin icon. Below it are two white rectangular input fields with thin gray borders. The first field contains the placeholder text "Enter Email" and the second field contains "Enter Password". Below the input fields are two rounded rectangular buttons with blue borders. The top button is labeled "Sign In" and the bottom button is labeled "Sign Up".



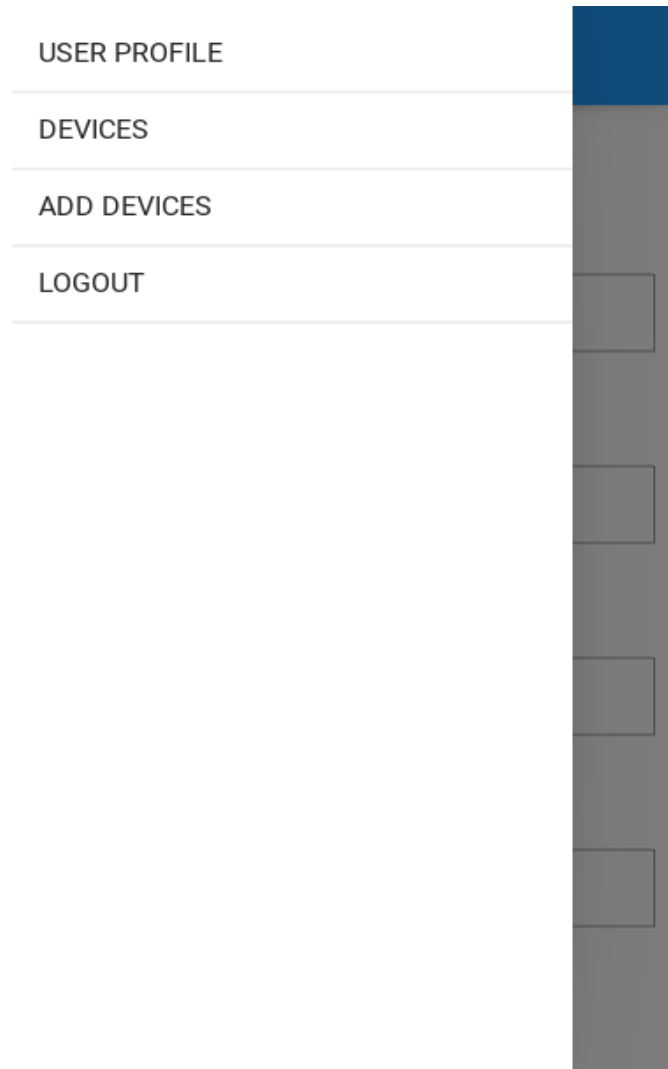
Enter Email

Enter Password

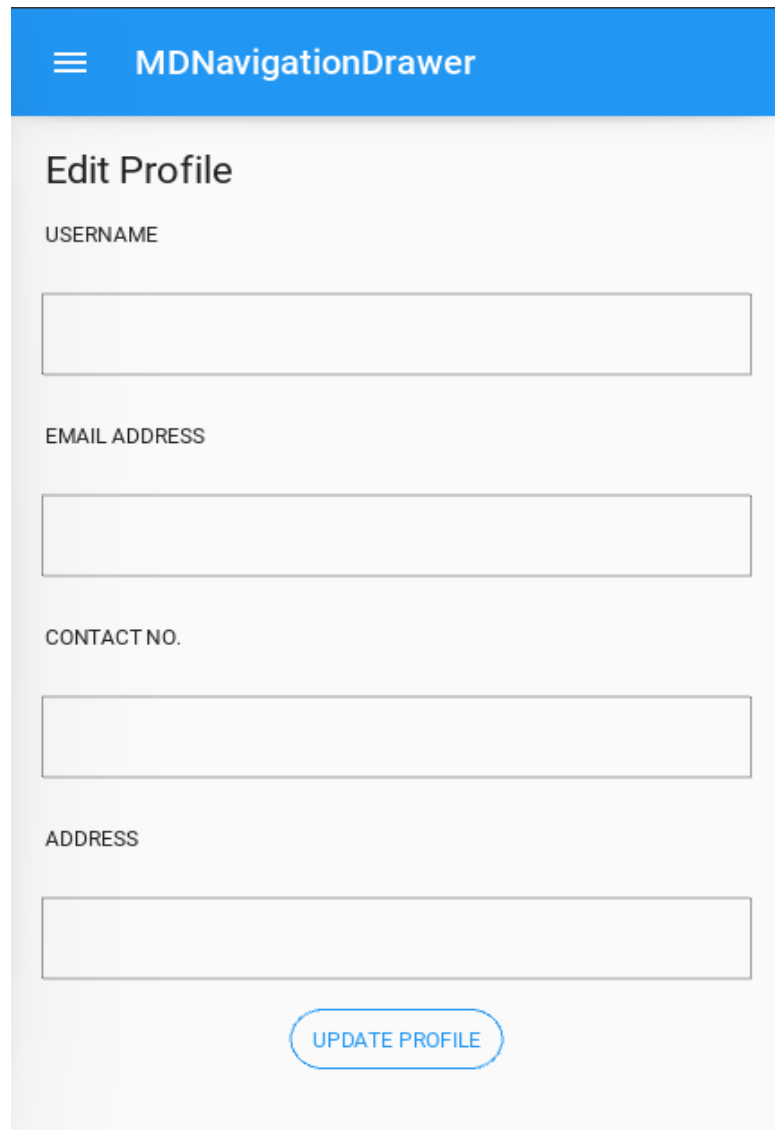
Sign In

Sign Up

Appendix – L: Navigation Drawer



Appendix – M: Mobile App User Screen



The image shows a mobile application screen for editing a user profile. At the top is a blue header bar with a white hamburger menu icon on the left and the text "MDNavigationDrawer" in white. Below the header, the screen has a light gray background. The title "Edit Profile" is displayed in a bold, dark gray font. There are four text input fields, each preceded by a label in a small, dark gray font: "USERNAME", "EMAIL ADDRESS", "CONTACT NO.", and "ADDRESS". Each input field is a simple white rectangle with a thin gray border. At the bottom center of the screen is a blue button with rounded corners and a white border, containing the text "UPDATE PROFILE" in white.

MDNavigationDrawer

Edit Profile

USERNAME

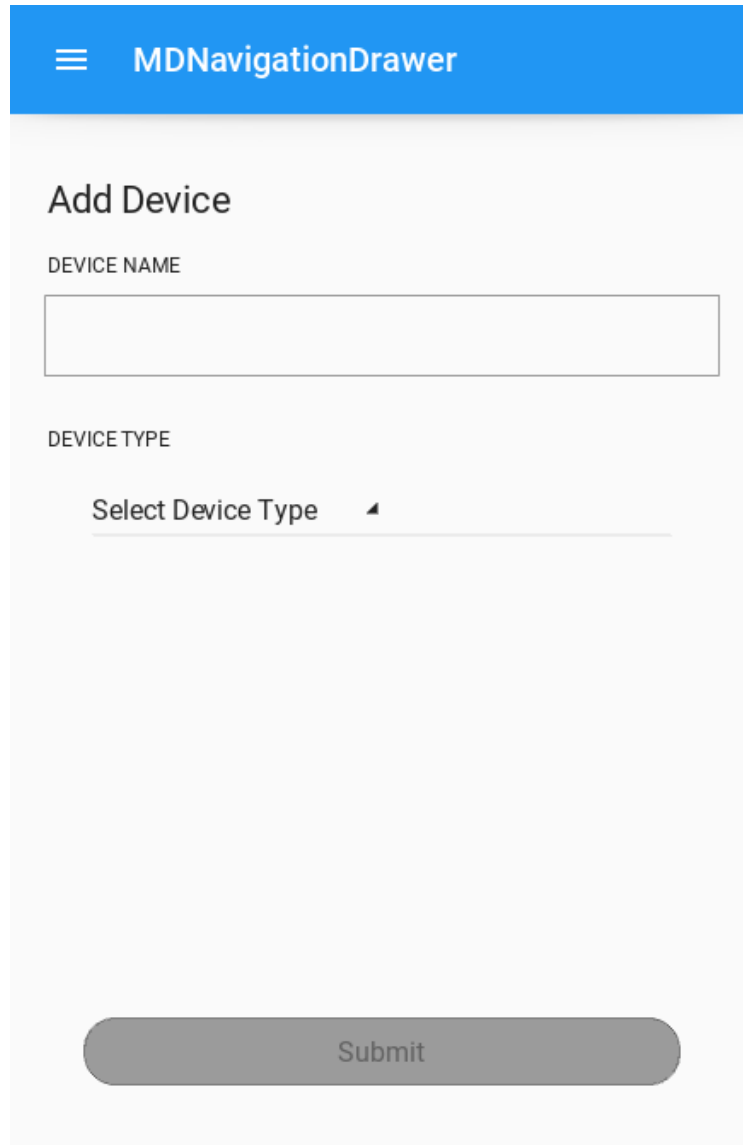
EMAIL ADDRESS

CONTACT NO.

ADDRESS

UPDATE PROFILE

Appendix – N: Mobile App Add Devices Screen



The image shows a mobile application screen for adding a device. At the top is a blue header bar with a white hamburger menu icon on the left and the text "MDNavigationDrawer" on the right. Below the header, the screen has a light gray background. The title "Add Device" is centered at the top of the form area. Below the title, there are two input fields. The first is labeled "DEVICE NAME" and is a simple rectangular text box. The second is labeled "DEVICE TYPE" and is a dropdown menu with the text "Select Device Type" and a small downward-pointing arrow. At the bottom of the screen, there is a wide, rounded gray button with the word "Submit" in the center.

MDNavigationDrawer

Add Device

DEVICE NAME

DEVICE TYPE

Select Device Type ▼

Submit

Appendix – O: Arduino Circuit

