“Buy At Best Price Application”

A Project Report

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Dr. Babasaheb Ambedkar Technological University’s

Lonere, Tal. Mangaon, Dist. Raigad, Maharashtra (INDIA) – 402103

Academic Year: 2021-22

CERTIFICATE

This is to certify that the project report entitled **"Buy At Best Price Application"** is the work carried out by

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Prof. S. M. Sabale

Guide and Head,

Department of Computer Engineering

Place: Lonere

Date:

ACKNOWLEDGEMENT

We are over helmed in all humbleness and gratefulness to acknowledge our depth to all those who have helped us to put these ideas, well above the level of simplicity and into something concrete.

"Any serious and lasting achievement or success, one can never achieve without the help, guidance and co-operation of so many people involved in the work."

We would like to express our special thanks and gratitude to our Dr. Madhukar Dabhade Sir, Principal, Institute of Petrochemical Engineering & the Head Of Department and our guide Prof. Santosh. M. Sabale Sir who gave us the golden opportunity to do this wonderful project on the Software – "Buy At Best Price", which also helped us in doing a lot of Research and we came to know about so many new things. We are really thankful to them.

We would also like to express our sincere thanks to other faculty members of our Computer Engineering Department for giving us opportunity to learn and constantly monitoring us throughout the project work.

Also, we would like to mention our sincere gratitute to all our friends & our support system and consideration of our parents who have always been there in our life.

We have tried our best to keep the report simple yet technically correct. We hope we succeed in our attempt.

Thanking You!

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ABSTRACT

We put forth **'Buy At Best Price'** Application that allows us to track price of product that we wish to buy. This project is an online application in which, we can track the price of the product by simply paste the link of that product in the link bar and then by clicking the search button.

We can set the maximum price for that product at which we want to buy. It keeps tracking the price of the product in background and notify us by sending messages through notifications. If we want the alert to be in Email format, we can choose those options under setting menu, by providing further necessary information like email address and phone number.

It also shows us the details of product on the dashboard. We can also see the graph of price from the time we added the product link to it. It better helps us to understand the day at which the minimum and maximum drop price of the product. Also, we can add the links of multiple products we wish to buy. It can also track the price of all products at a time.

A price tracker is a technical solution that helps (online) Buyers, track prices of competitors of online websites and dealers. It makes the process of tracking prices easier and less painful, and it also gives information to make pricing decisions.

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CHAPTER 1

INTRODUCTION

1.1 Introduction of application:

- 'Buy At Best Price' is an online application. It allows users to track the price of the product that they wish to buy.
- It notifies the user the user if price is goes down to that certain limit. It helps the user to show the details of the product eventually in the graph format.
- It gives the user opportunity to buy that product at best price. It also allows user to add link of multiple products they wish to track price.

Fig.1.1. Logo

1.2 Problem Statement:

Many a times we see that the products that we desire to buy are overpriced or not under our budget. Hence, we wait for sale or the product price to go down and find an opportunity to buy that product in affordable rate. But often we get to see that the price of some products inclines to low down for limited time, and if we are busy, we don't get a chance to get that offer. Solution to this condition is a software that will keep an eye on the price of product continuously in the background so that if the price goes down it will alert us through Email, that the price of product is down, and we should buy it as soon as possible. This kind of software can really be beneficial will buying online goods from amazon, flipkart or any other website and could save our small sum of money on each of our expenses.

1.3 Objectives:

The purpose to build this application is to allow the user to buy the product they wish to buy at the best price. A price tracker is a technical solution that helps (online) Buyers, track prices of competitors of online websites and dealers. It makes the process of tracking prices easier and less painful, and it also gives information to make pricing decisions.

This application is the technical solution for the users to buy their wished products at their best price. It helps the user to make pricing decisions by giving them products price information by continuously tracking the product and shows the details through price graph It makes the process of tracking prices easier and less painful, and it also gives information to make pricing decisions.

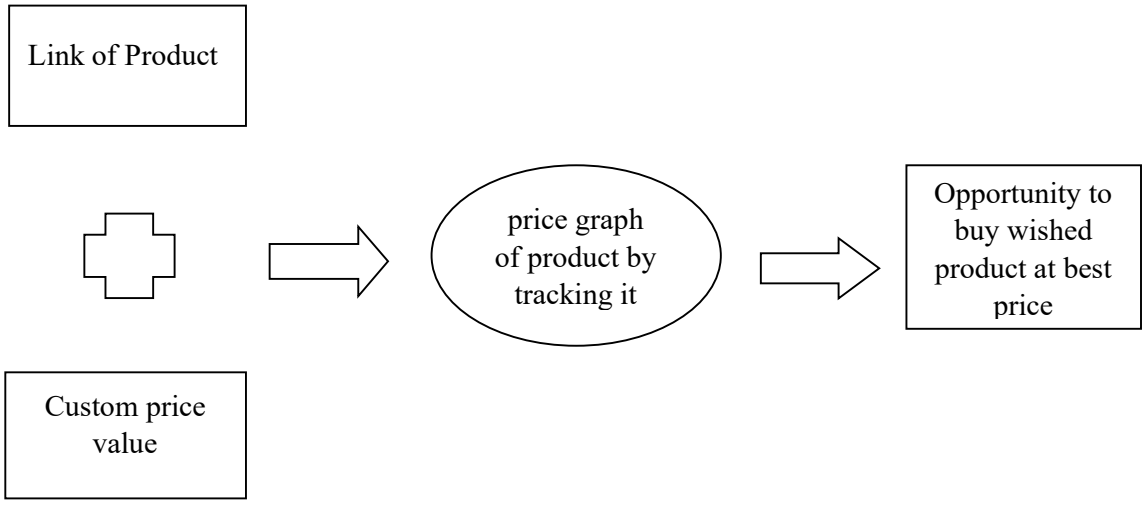


Fig.1.2. Structure of Application.

CHAPTER 2

LITERATURE SURVEY

We all buy stuff online. Sometimes we buy from an online store or marketplace. Sometimes, before we buy, we visit online shopping sites like amazon or flipkart for dynamic pricing analysis. These websites focus on offering the end buyer the best deal. But sometimes there are fluctuations in their product prices.

A price tracker is a technical solution that helps (online) Buyers, track prices of competitors of online websites and dealers. It makes the process of tracking prices easier and less painful, and it also gives information to make pricing decisions.

2.1 Information collected in Requirement Gathering:

i. People usually tend to buy products from ecom websites like Amazon or Flipkart, when the price of desired products decreases, in some cases a buyer waits until the price in decreases in its favour.
ii. We have price tracking websites which could track prices of product from e commerce websites like Amazon or Flipkart. Such tracing websites actually doing the same thing, instead of Checking Price through Source website, this has created a limitation in its use.
iii. There is no software that could alert its users if the price decreases or runs displaying their wish-list of products.
iv. We are providing a software which could do the same i.e., not only tracking price of product, but also can seamlessly track price in background, while the user is another work.
v. It also has a notification-based alert system to alert user if the price of product goes down as per users(buyer's) will.
vi. Users can also add and track list of products that he/she tends to buy, from different websites into it.

2.2 EXISTING SYSTEM:

Currently, for online buyers, if they want to buy their wished product, they have to visit online shopping sites like amazon, flipkart and other sites continuously for checking the price and dynamic pricing analysis. These websites focus on offering the end buyer the best deal. But sometimes there are fluctuations in their product prices. This may sometimes more painful and troubling.

2.3 Limitations of Existing System:

- If we want to buy products on online shopping apps, we have to visit these sites continuously for checking whether the price is drop or not.
- It may sometimes more troubling and painful.
- It also takes more time, that means it cause waste of time.
- These online shopping sites sell their products in sales sometimes the product that we wish to buy is in the lowest price and sometimes we don't even know that.

2.4 Proposed Approach:

- Now we are trying to create an online application for online buyers to buy the product that they wish in their best price.
- This application tracks the products price continuously and notify us through notifications.
- By using the price tracking application, you are monitoring the whole market.
- This application alerts you to set up means, you can accelerate your response/adjust your prices dynamically accordingly.
- Price tracking software means you have all the relevant pricing information at your fingertips, and it becomes much easier to make accurate decisions for the future success of your business.
- By using this application, we can save our time and money.

CHAPTER 3

REQUIREMENTS ANALYSIS

3.1 Functional Requirements:

Functional requirements are the requirements that define specific behaviour or function of the system.

- Login: Login function will authenticate the user if username and password are correct otherwise it will exit the system.
- Price tracker: Price tracker function helps to track the price of product.
- Price graph: Price graph functions shows the graph of the tracked product's price.
- Link bar: Link bar function provides an input textfield to paste the link of product.
- Search: Search function allows to search the link in the link bar of product and start tracking it in the background.
- Notification: Notification function gives the alert messages of price drop of tracked product through email.

3.2 System Requirements:

3.2.1 Software Requirements:

- Visual Studio Code Editor
- Inno Setup3
- Figma

3.2.2 Requirements of Modules, Packages and Libraries:

- Tkinterpy (GUI)
- tkinter (Package)
- SQlite3 (Database)

- Beautiful Soup (Library)
- smtplib (Library)
- Matplotlib (Library)
- pyler (Library)
- PIL (Library)
- datetime (Library)
- tkinterweb (Package)
- Urllib (Library)
- webbrowser (Library)
- Matplotlib (Library)
- mplcursors (Library)
- csv (Library)
- ConfigParser(Library)
- pandas (Library)
- winsound (Library)
- pyinstaller (Package)

3.3 Methodology Requirement:

This overall all software will be built using **Python**, Python-GUI – **Tinkerpy**, **Inno Setup** for creating .exe file. When a product link is entered in it link bar, the software's python code will web scrap the html file through link, for this it will use **request module** and **BeautifulSoup** library for **web scrapping** price from html. The Tinkerpy GUI will be used to build this software accessible for all users. Users' information will be stored using ini file and Products information will be stored using Sqlite3 for database. The graph of price will be displayed using **Matplotlib** library of Python. The primary windows notification will be given through **pyler** library of python. The email notification will be sent using **smtp** library.

CHAPTER 4

SYSTEM DESIGNS

Engineering is the application of scientific and practical knowledge to invent, design, build, maintain, and improve frameworks, processes, etc. Software Development life cycle (SDLC) is a spiritual model used in project management that defines the stages include in an information system development project, from an initial feasibility study to the maintenance of the completed application.

For developing our **"Buy at Best Price"** Software we started up with Software Prototyping and Iterative model for designing UI and then followed the **Incremental Model** from SDLC. In which process of our software development where we divided requirements into multiple standalone modules of the software development cycle. In this model, each module goes through the requirements, design, implementation and testing phases. Every subsequent release of the module adds function to the previous release. The process continues until the complete system achieved.

4.1 The various phases of incremental model are as follows:

1. Requirement analysis: In the first phase of the incremental model, the product analysis is carried out- identifies the requirements. And the system functional requirements are understood by the requirement analysis team. To develop the software under the incremental model, this phase performs a crucial role.

2. Design & Development: In this phase of the Incremental model of SDLC, the design of the system functionality and the development method are finished with success. When software develops new practicality, the incremental model uses style and development phase.

3. Testing: In the incremental model, the testing phase checks the performance of each existing function as well as additional functionality. In the testing phase, the various methods are used to test the behavior of each task.

4. Implementation: Implementation phase enables the coding phase of the development system. It involves the final coding that design in the designing and

development phase and tests the functionality in the testing phase. After completion of this phase, the number of the product working is enhanced and upgraded up to the final system product.

4.2 Why we used the Incremental Model?

- As we started to develop our software from scratch without making use of any framework or api, this project had a lengthy development schedule.
- Software development team are not very well skilled or trained.
- As to submit project on time there was need of quick release of software.
- You can develop prioritized requirements first.
- Errors are easy to be recognized.
- Easier to test and debug
- More flexible.
- Simple to manage risk because it handled during its iteration.

4.3 Development Stages:

1. Paper Wireframing: During the requirement analysis phase, we had brainstorming sessions with our development team, and derived some idea i.e., how should our software perform? how it will look? what elements will it contains? etc. From such brainstorming sessions we conclude our ideas on Paper wireframes. A Paper wireframe is a sketch or drawing that represents the skeleton of a website or an app interface. We translated our ideas into a sheet of paper to represent how our product would appear in the end. Glimpse of these Paper wireframes are given bellow:

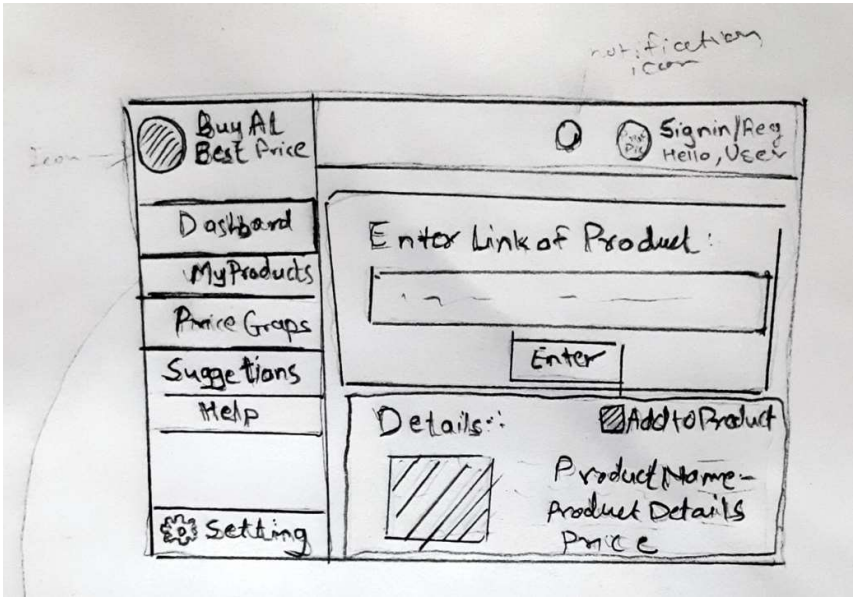


Fig.4.1.1. Paper Wireframes

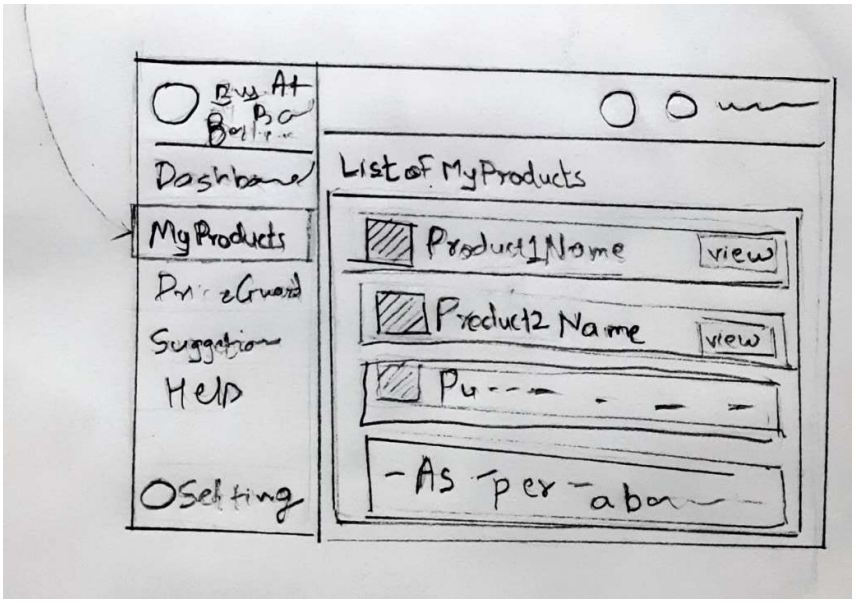


Fig.4.1.2. Paper Wireframes

2.UI Prototyping: After thorough discussion on the paper wireframes, we decided to move to www.figma.com/ for creating digital prototypes. Prototyping is an experimental process where we implemented ideas into tangible forms, from paper to digital. Aim of creating such UI design was to, accurate the placement of elements so that it becomes beneficial while developing UX based GUI in Tkinter. Glimpse of our first UI designs are shown below:

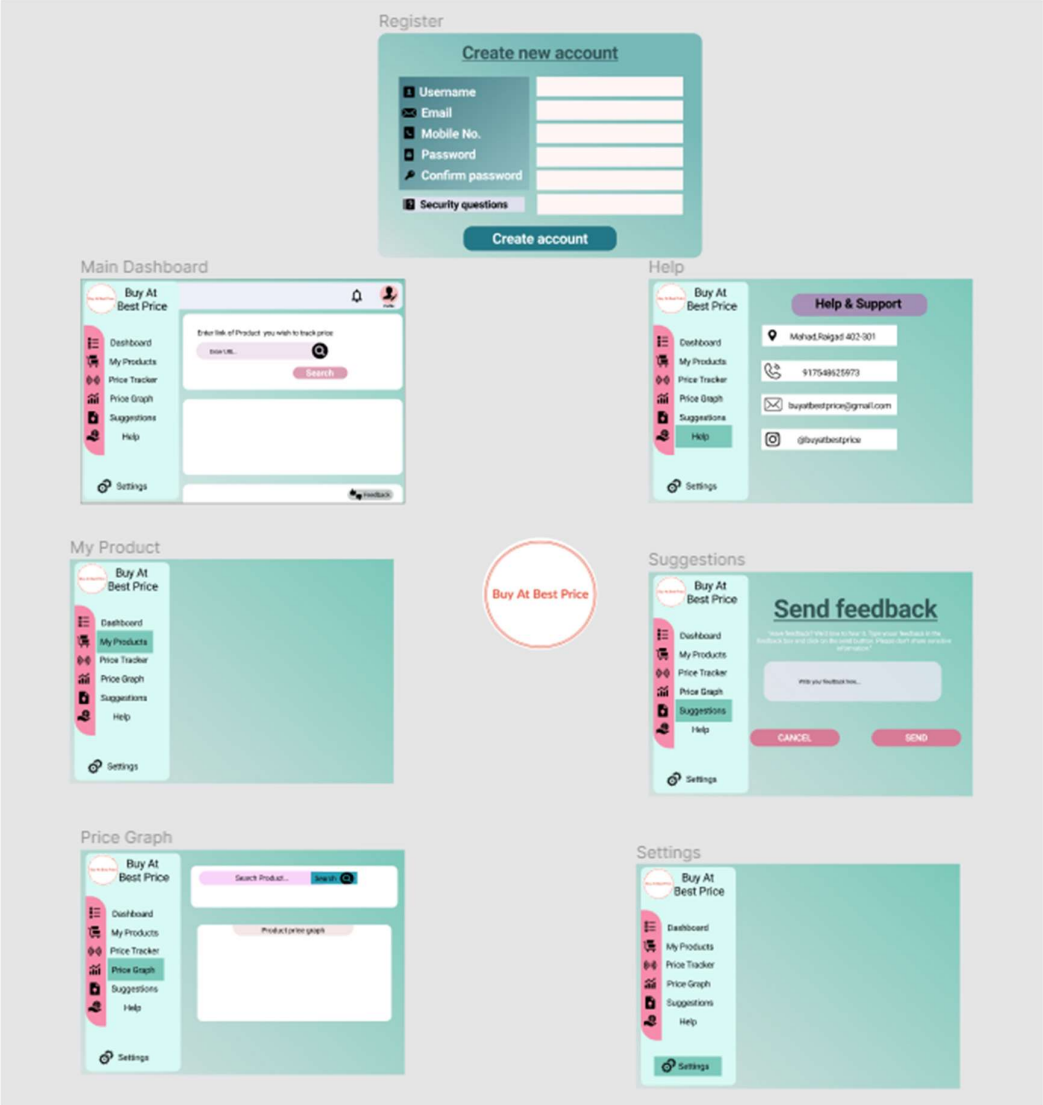


Fig.4.2. UI Prototyping on Figma.

3. Building our software from scratch: Python offers multiple options for developing GUI (Graphical User Interface). Out of all the GUI methods, Tkinter is the most commonly used method. It is a standard Python interface to the Tk GUI toolkit shipped with Python. Hence for developing our software we chose Tkinter as GUI method.

Working upon a whole new GUI wasn't easy for our team, we started trying and building each element by reading into documentation provided onto official website. We further added lots of self-defined functions modifying the source functions to create a better User-Interface. Further, we kept on iterating designs to better the user-interface and overall smoothen user-experience. Glimpse of our first GUI development is show below:

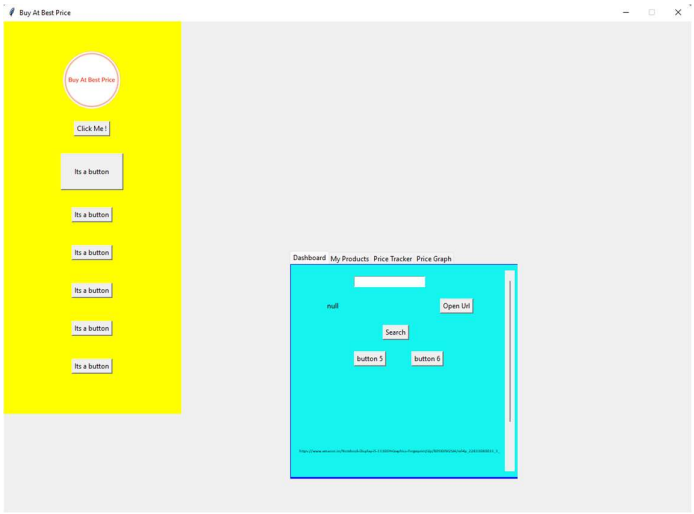
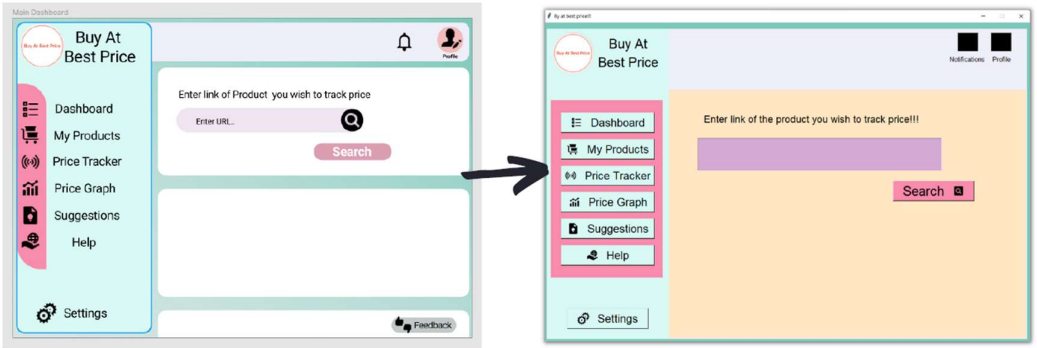


Fig.4.3.1. Developing software from scratch.



Prototype designed on Figma

Actual Implementation from Prototype design

Fig.4.3.2. Turning designs to GUI.

4.Coding in Backend: Main aim of our software was to track prices and product name from given link of ecommerce website, to achieve this, we made use of Web scraping technique, this core technique of our software parses the html file and its elements to find out prices and product name in it.

During initial stage of our software development, we started building a module of code that can print product name and product price into terminal output, if supporting link is given, by web scraping the html file content. Further this module was enhanced such a way that it accepts input through input field of Tkinter GUI and show the output using Label element, thus it became the backbone of our price tracking software. Glimpse of it during initial stages is shown below:

```
from os import error
import bs4
import urllib.request
import urllib
from urllib.request import urlopen
import time

def pricecheck(txt):
    price_list=[]


    entered_url=txt

    req = urllib.request.Request(entered_url, data=None,
    headers={
    'User-Agent': 'Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/96.0.4664.110 Safari/537.36'
    })
    sauce = urllib.request.urlopen(req).read()
    soup = bs4.BeautifulSoup(sauce,"html.parser")
    pricelist=[]

    if "www.amazon." in entered_url:
        try:
            price_soup = soup.find_all('span', attrs={'class':'a-offscreen'})

            for span in price_soup:

                pr= span.getText()
                price_list.append(pr)

            prices=price_list[0]

            p_name = soup.find("span", id="productTitle", attrs={'class':'a-size-large product-title-word-break'})

            for span in p_name:
                product_name_indetail = span.getText()
            product_name= " ".join(product_name_indetail.split()[:8])+"..."

            print(f"Price of {product_name} is : "+prices)
        except:
            print("trying books code!")
            try:
                ######################bookk code below
                price_soup = soup.find_all('span', attrs={'class':'a-size-medium a-color-price inlineBlock-display offer-price a-text-normal price3P'})

                for span in price_soup:

                    pr= span.getText()
```

Fig.4.4.1. Web scaping Function- Code

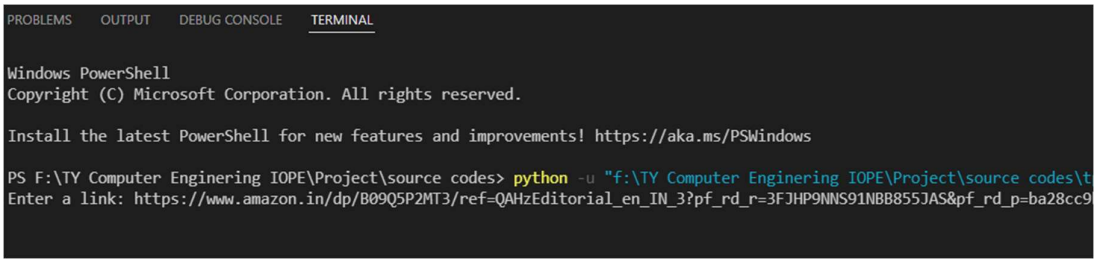


Fig.4.4.2. Web scaping Function- Running

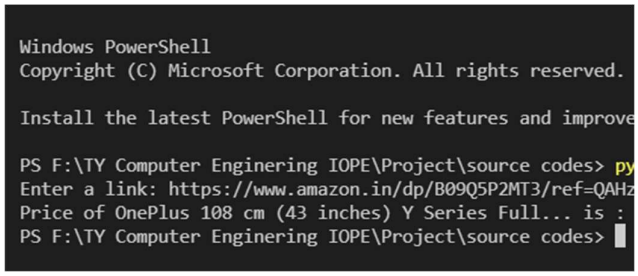


Fig.4.4.3. Web scaping Function- Output

5. Improvising User Experience:

A product is more than the product. It is a cohesive, integrated set of experiences. We aimed to continuously enhanced user experience with our software. We consider the Why, What and How of product use. Thus, kept on improvising our designs, GUI and overall user experience. Glimpse of our current UI designs and GUI are shown below:

Fig.4.5.1. Modified Logo and Color Scheme of Software

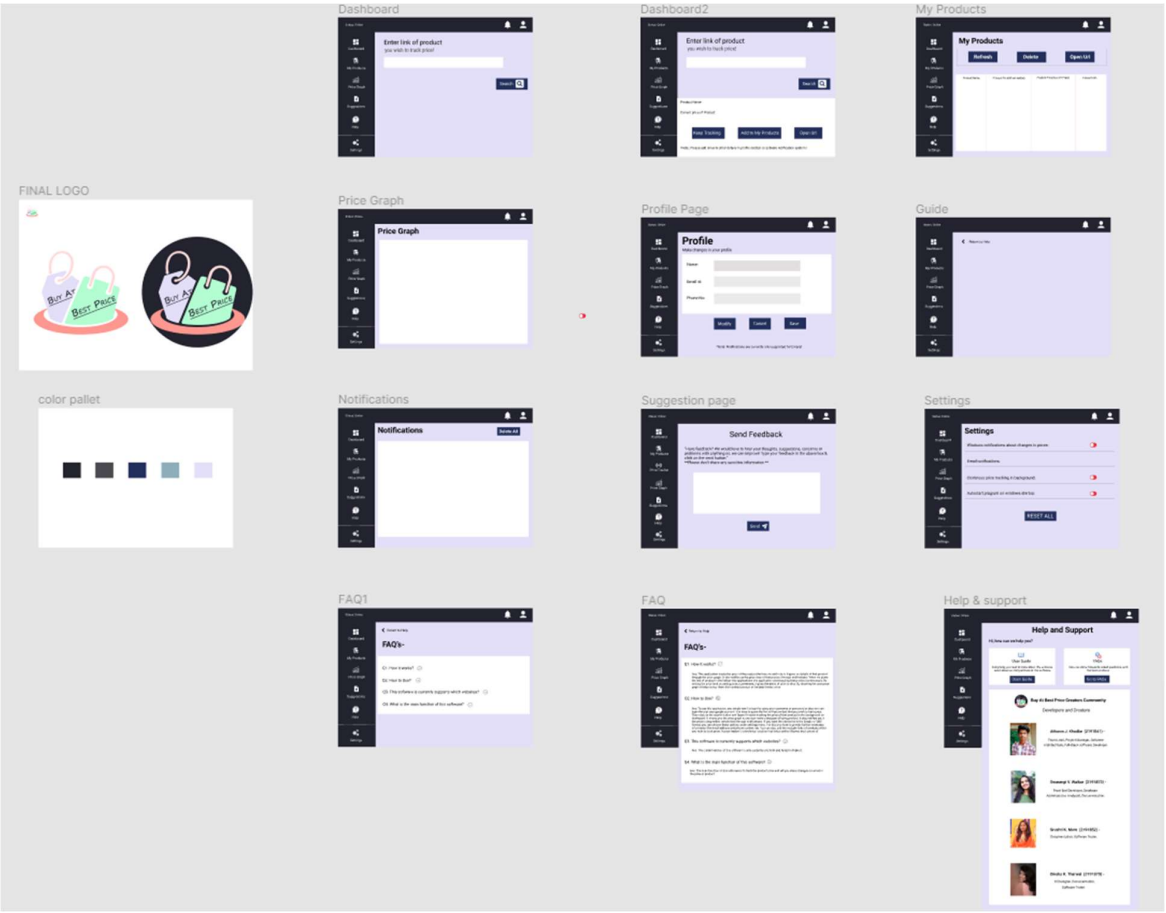


Fig.4.5.2. Modified Software Designs on Figma

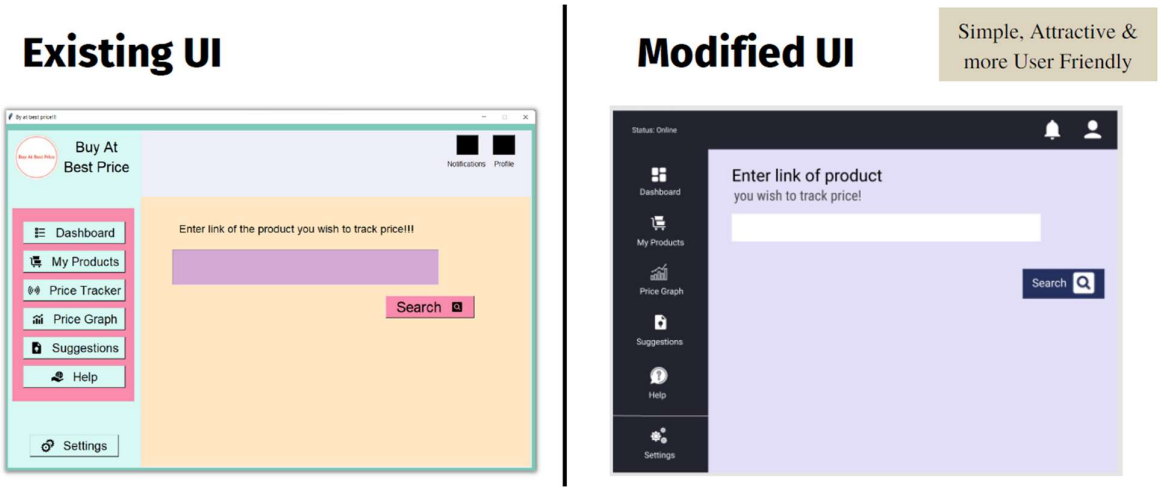


Fig.4.5.3 Existing GUI and Modified/Current GUI

CHAPTER 5

UML DIAGRAMS

5.1 USE-CASE Diagram:

Use-case diagrams describe the high-level functions and scope of a system. The use cases and actors in use-case diagrams describe what the system does and how the actors use it, but not how the system operates internally.

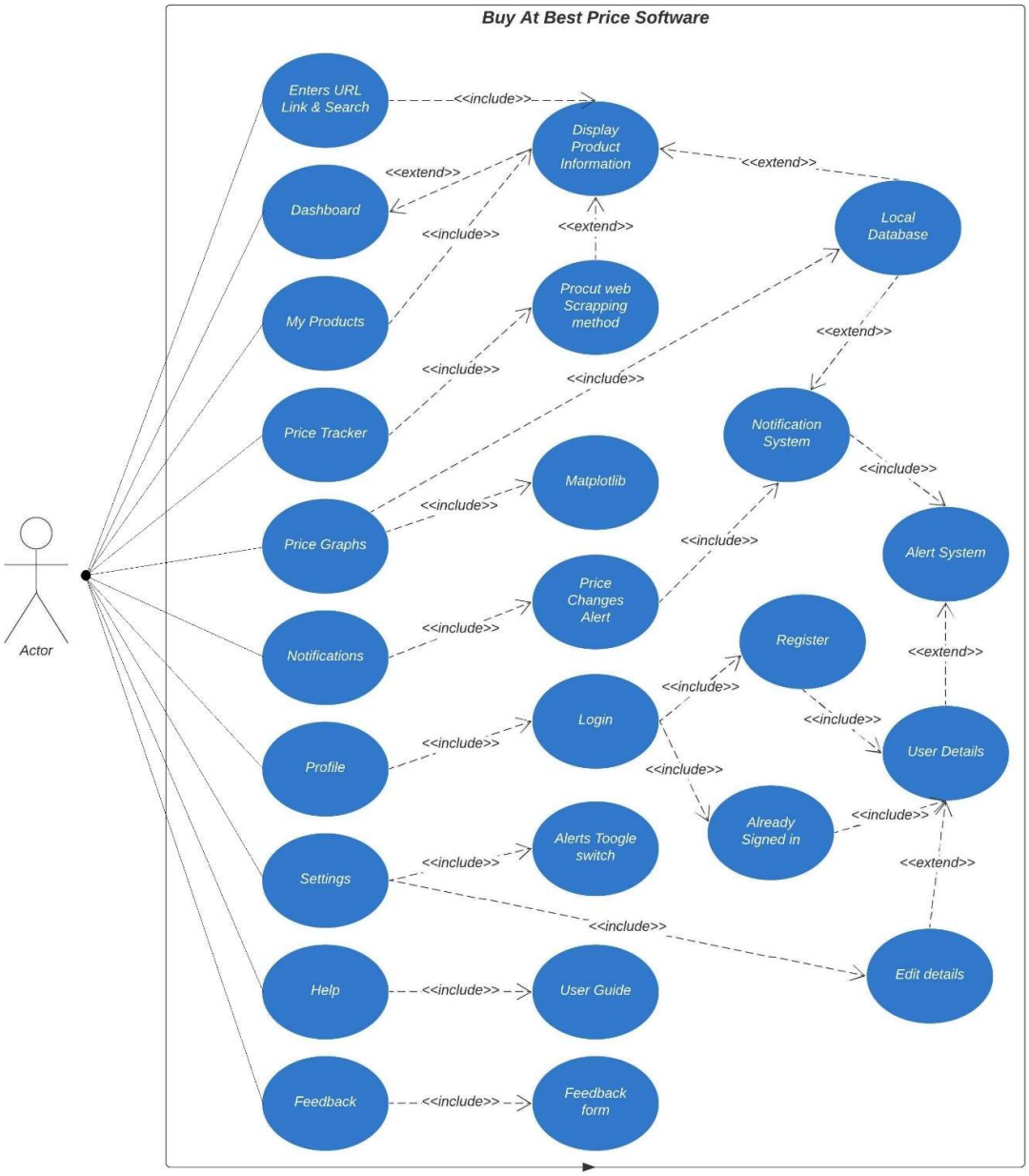


Fig. 5.1. USE-CASE Diagram

5.2 DATA FLOW Diagram:

A data flow diagram shows the way information flows through a process or system. It includes data inputs and outputs, data stores, and the various subprocesses the data moves through. ... You can use these diagrams to map out an existing system and make it better or to plan out a new system for implementation.

5.2.1 Level 0 DFD:

DFD Level 0 is also called a Context Diagram. It's a basic overview of the whole system or process being analysed or modelled. It's designed to be an at-a-glance view, showing the system as a single high-level process, with its relationship to external entities.

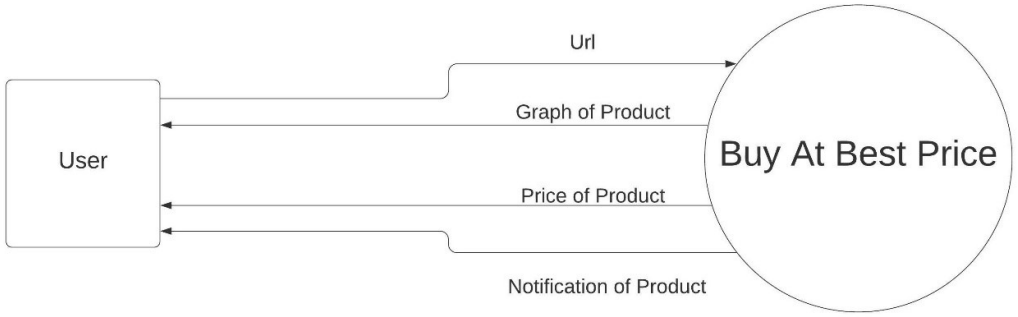


Fig. 5.2.1. Level 0 DFD

5.2.2 Level 1 DFD:

A level 1 DFD notates each of the main sub-processes that together form the complete system. We can think of a level 1 DFD as an “exploded view” of the context diagram.

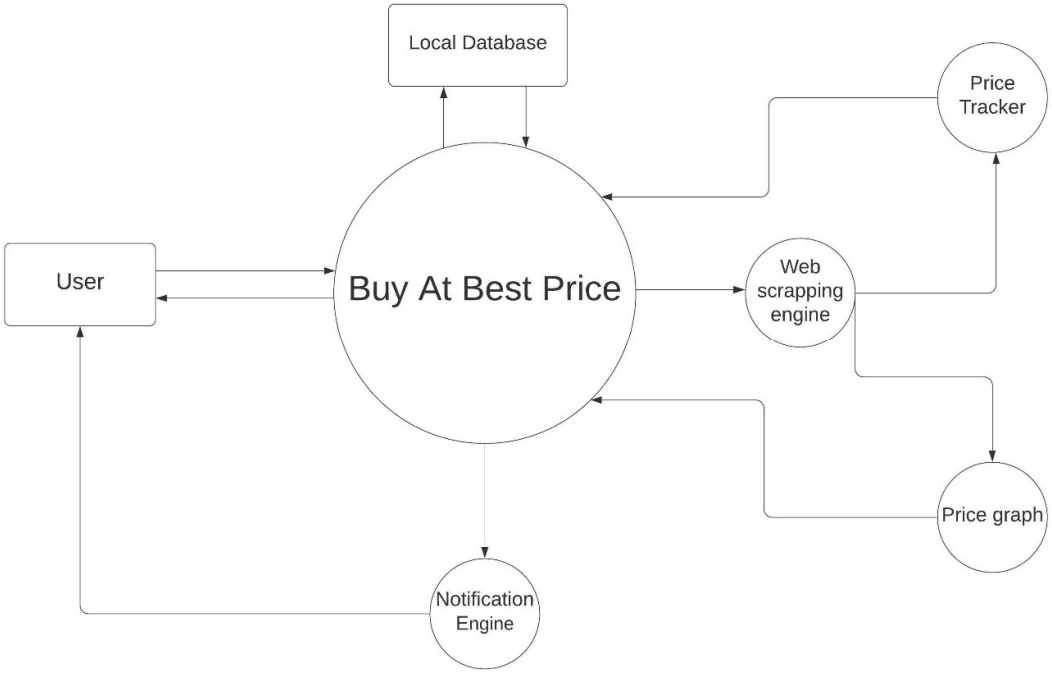


Fig.5.2.2. Level 1 DFD

5.2.3 Level 2 DFD:

2-level DFD goes one step deeper into parts of 1-level DFD. It can be used to plan or record the specific/necessary detail about the system's functioning.

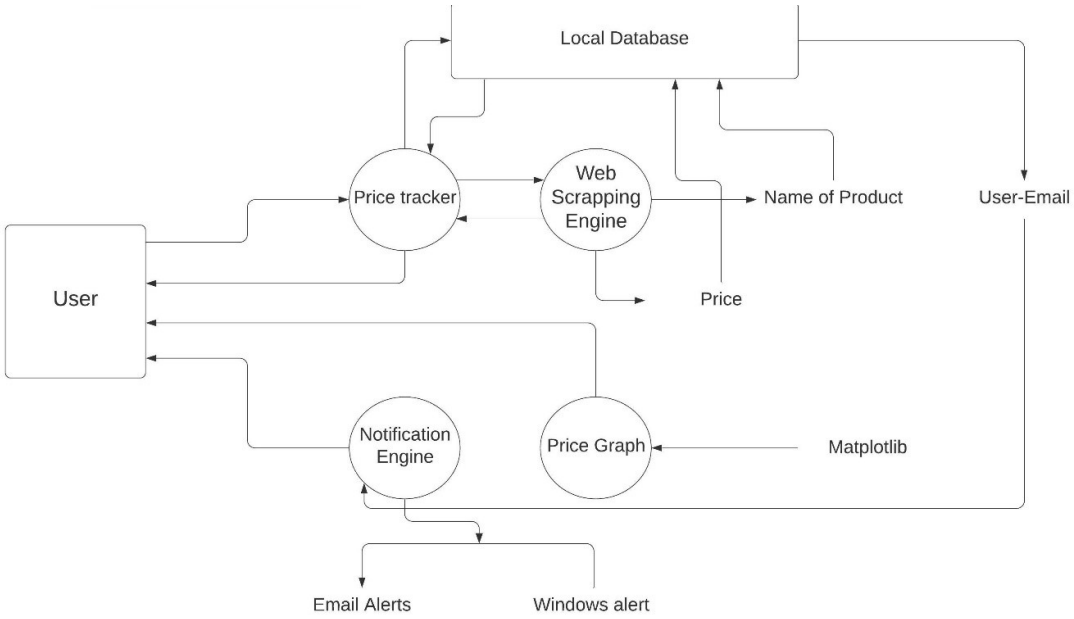


Fig. 5.2.3. Level 2 DFD

5.3 Entity-Relationship Diagram:

An Entity–relationship model (ER model) describes the structure of a database with the help of a diagram, which is known as Entity Relationship Diagram (ER Diagram). An ER model is a design or blueprint of a database that can later be implemented as a database. The main components of E-R model are: entity set and relationship set.

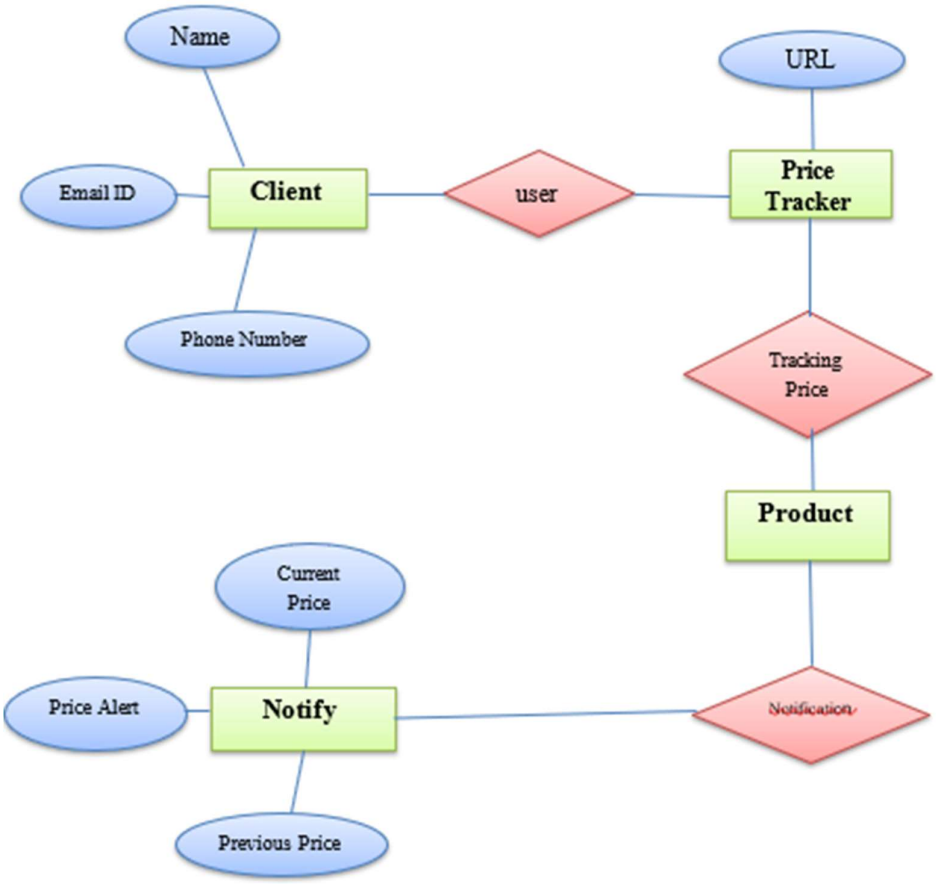


Fig.5.3. Entity-Relationship Diagram

5.4 Activity Diagram:

An activity diagram is a behavioural diagram i.e. it depicts the behaviour of a system. An activity diagram portrays the control flow from a start point to a finish point showing the various decision paths that exist while the activity is being executed.

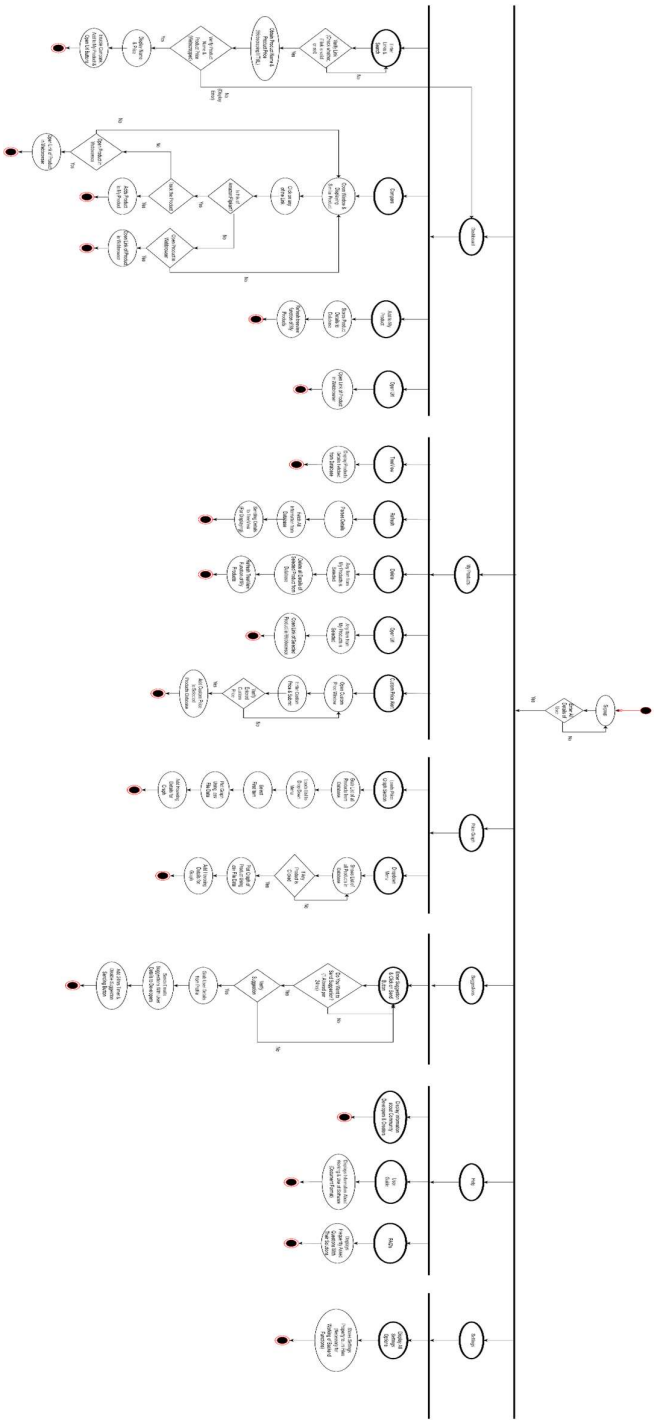


Fig.5.4. Activity Diagram

CHAPTER 6

IMPLEMENTATION

We implemented the designs drawn in Figma into Tkinter GUI of python, for our Buy At Best Price software. Glimpse of our software are shown below:

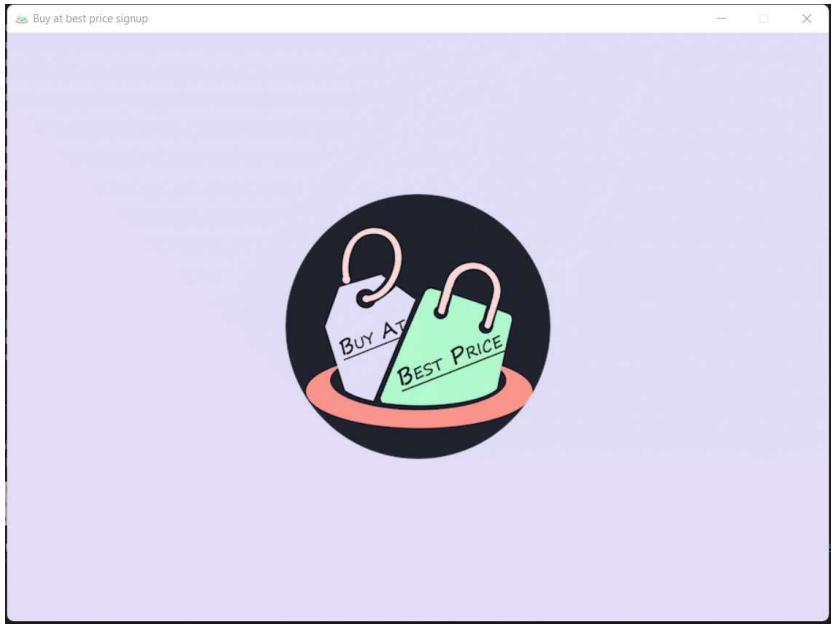


Fig.6.1. Buy At Best Price Logo Screen

Fig.6.2. Signup Window

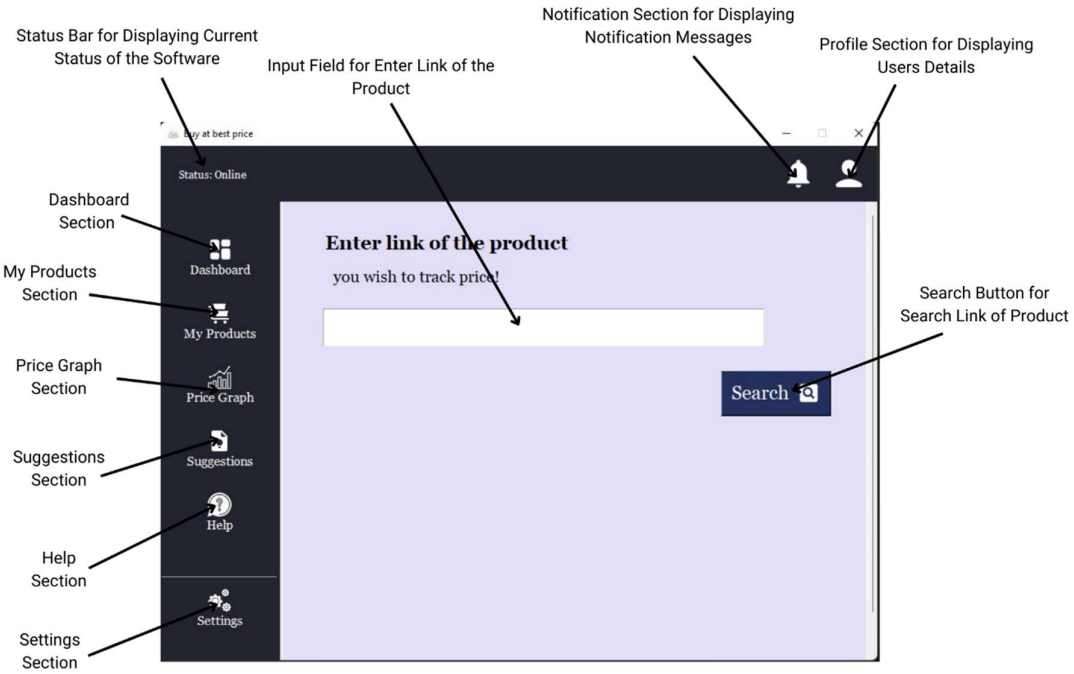


Fig.6.3.1 Dashboard Section (1)

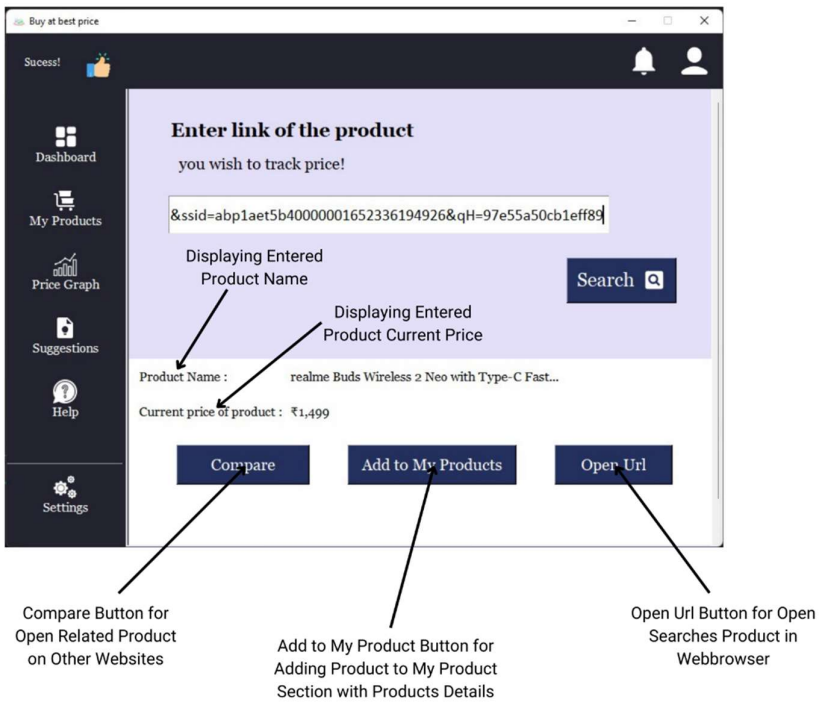


Fig.6.3.2. Dashboard Section (2)

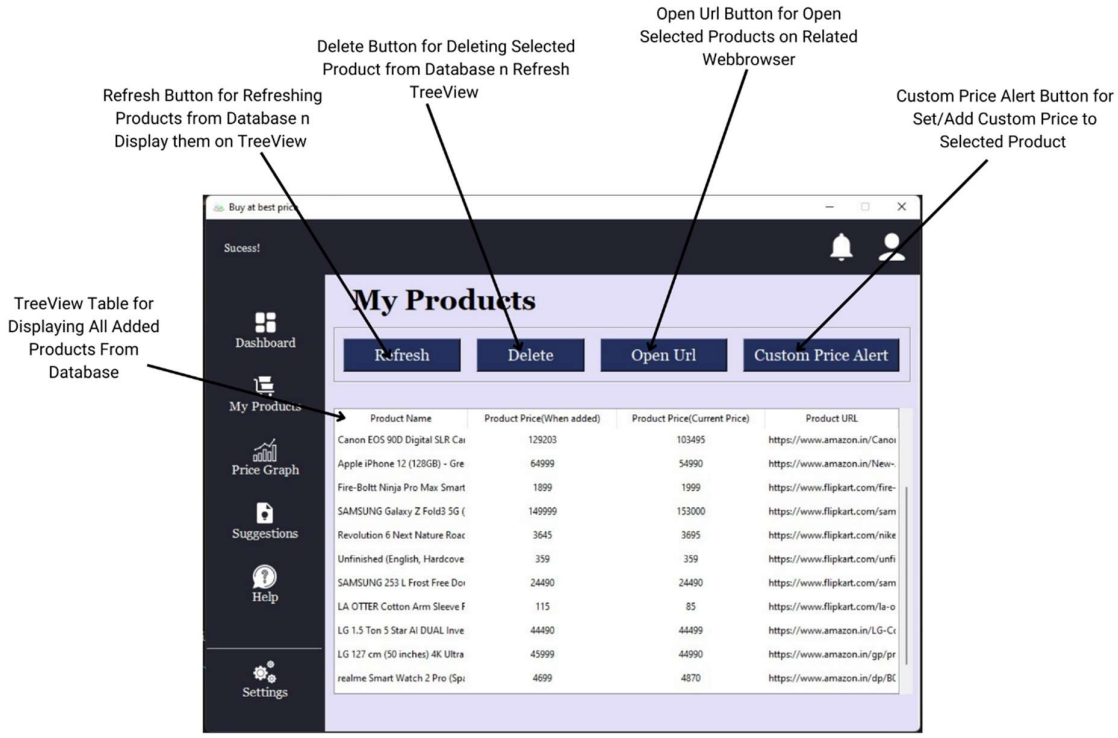


Fig.6.4. My Products Section.

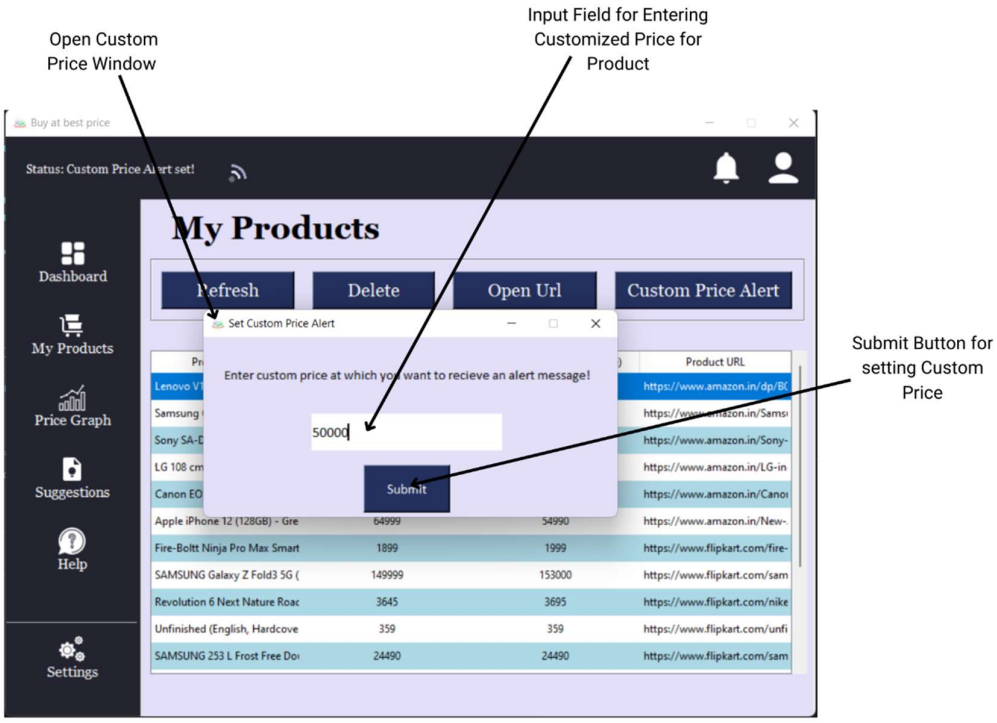


Fig.6.5. Custom Price Alert Window

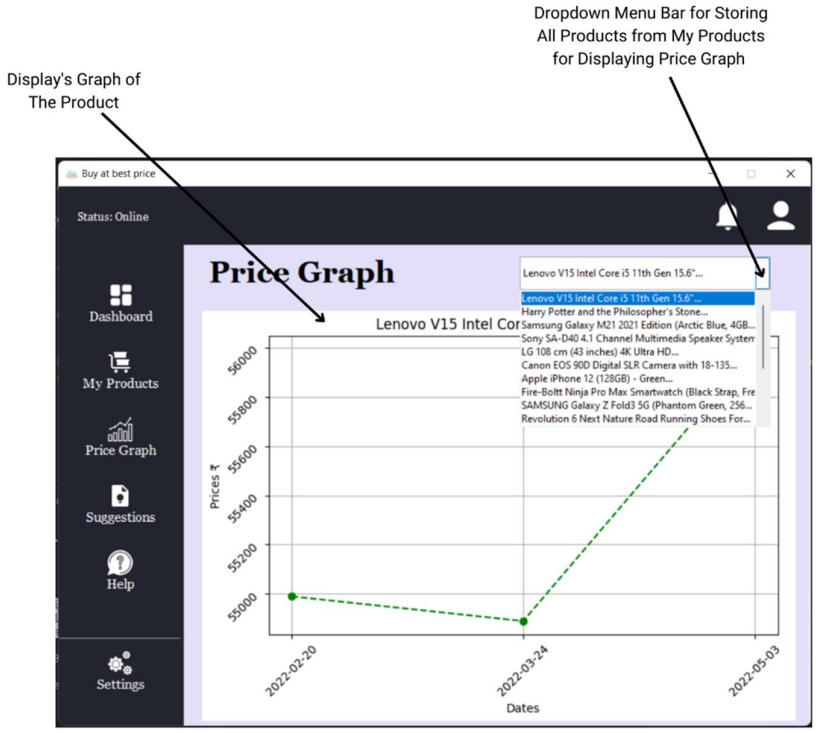


Fig.6.6. Price Graph Section

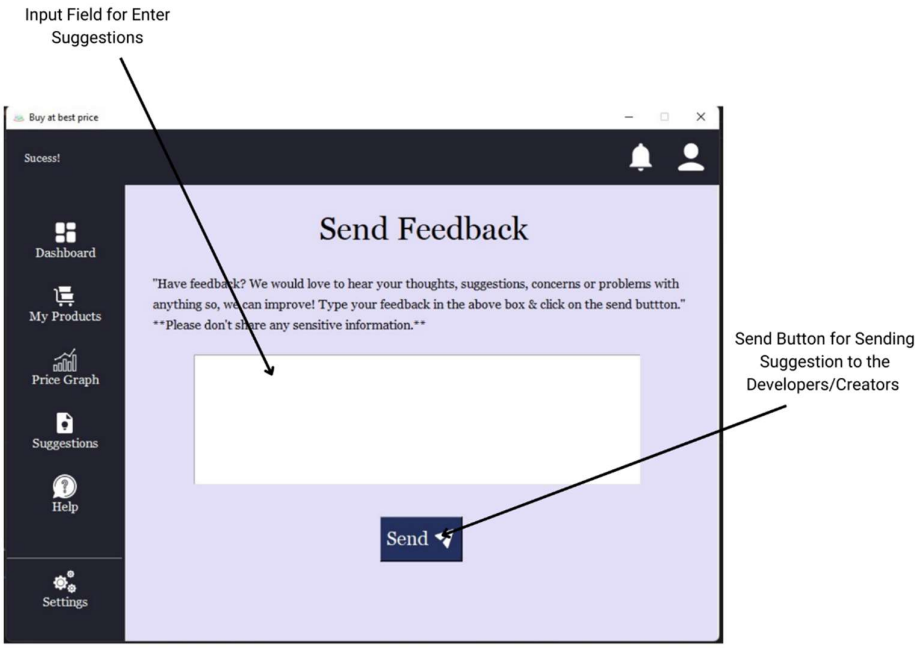


Fig.6.7. Suggestions Section

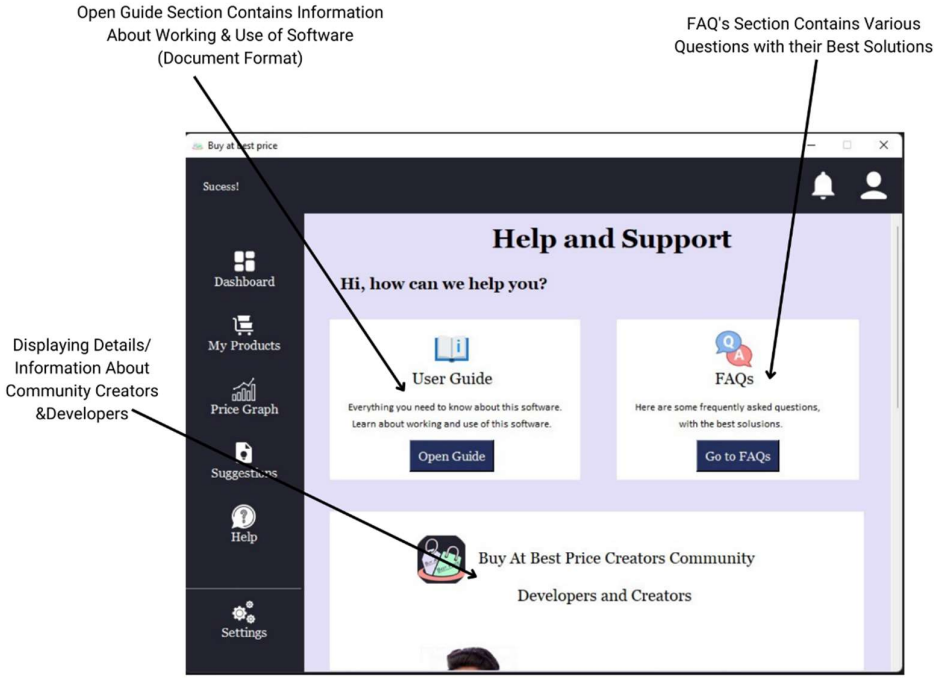


Fig.6.8. Help & Support Section

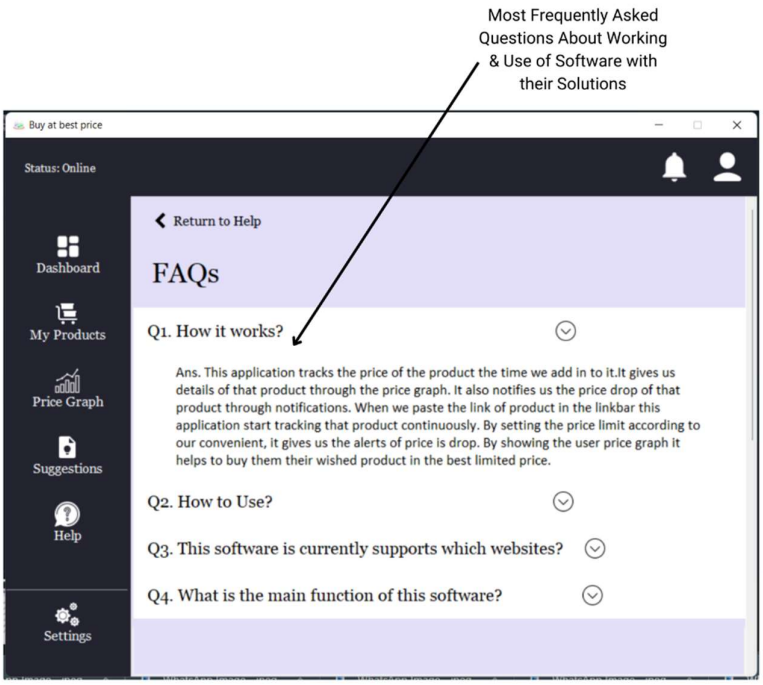


Fig.6.9. FAQ's Section

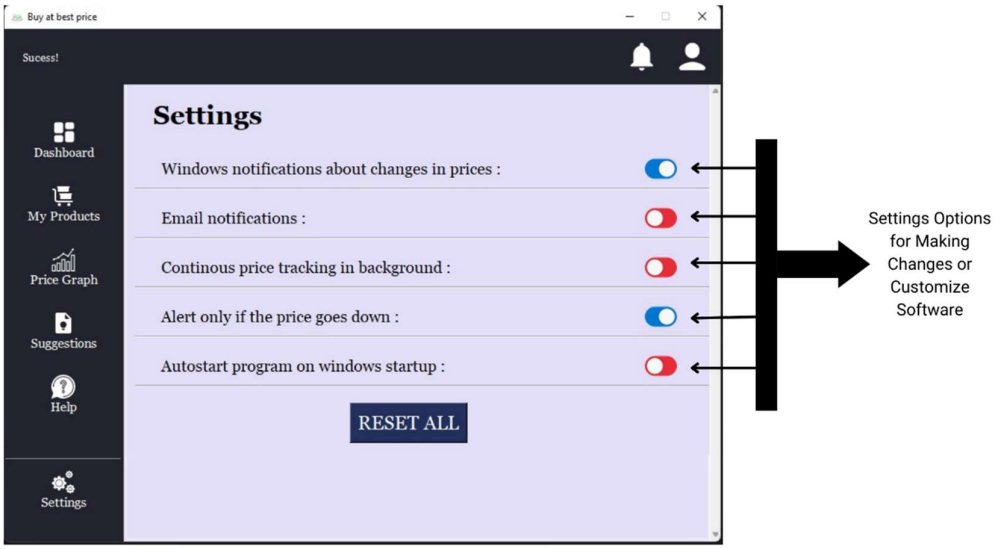


Fig.6.10. Settings Section

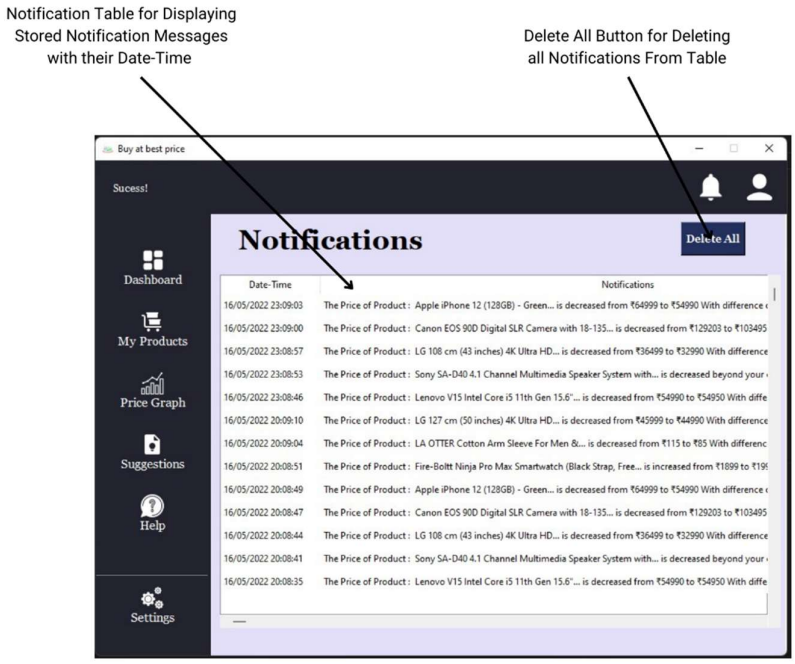


Fig.6.11. Notifications Section

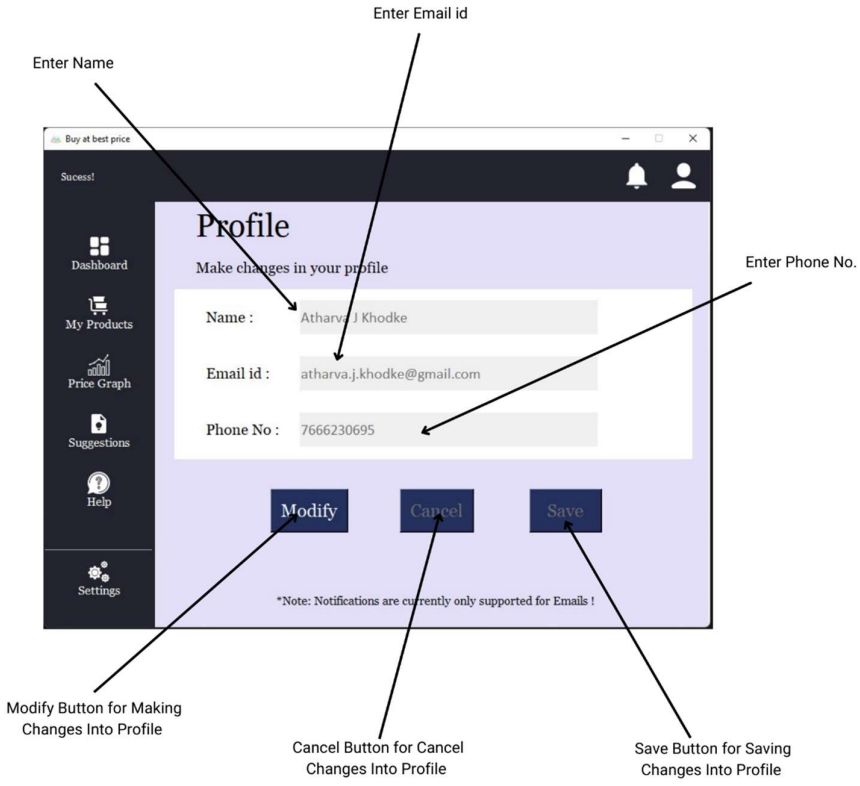


Fig.6.12. Profile Section

CHAPTER 7

WORKING OF APPLICATION

7.1 How It Works?

- This application tracks the price of the product the time we add in to it.
- It gives us details of that product through the price graph.
- It also notifies us the price drop of that product through notifications.
- When we paste the link of product in the linkbar this application start tracking that product continuously.
- By setting the price limit according to our convenient, it gives us the alerts of price is drop.
- By showing the user price graph it helps to buy them their wished product in the best limited price.

7.2 How to Use?

- To use this application, you simply need to login by using your username and password or also you can login through your google account.
- You have to paste the link of the product that you wish to track price.
- Then click on the search button and Boom!
- It starts tracking the price of that product in the background on dashboard.
- It shows you the price graph so you can make a decision of buying product.
- It also notifies you if the price is drop within a certain limit through notifications.
- If you want the alert to be in the Email format, you can choose those options under settings menu.
- For that you have to provide further necessary information like email address and phone number, etc.
- You can also add the multiple links of products which you wish to track price.

- A price tracker is a technical solution that helps (online) Buyers, track prices of competitors of online websites and dealers. It makes the process of tracking prices easier and less painful, and it also gives information to make pricing decisions.

7.3 Example:

If I wish to buy a iPhone which is at Rs. 64,000, and I can afford this iPhone only at Rs. 60,000 or below. It means this is my custom price. I wish that my application should only remain me of this iPhone, if the price falls beyond Rs. 60,000. So, we can do it by putting a remainder if custom notification alert. It notifies me by giving alert messages through email and windows notification and show me the details through price graph. So, I can buy my wish product at my custom price.

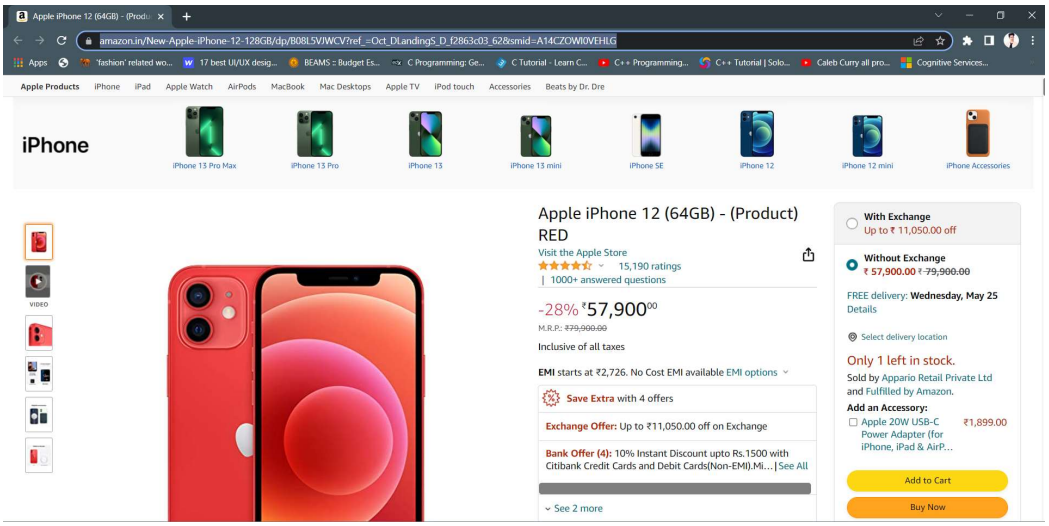


Fig.7.1. Coping link of product to track.

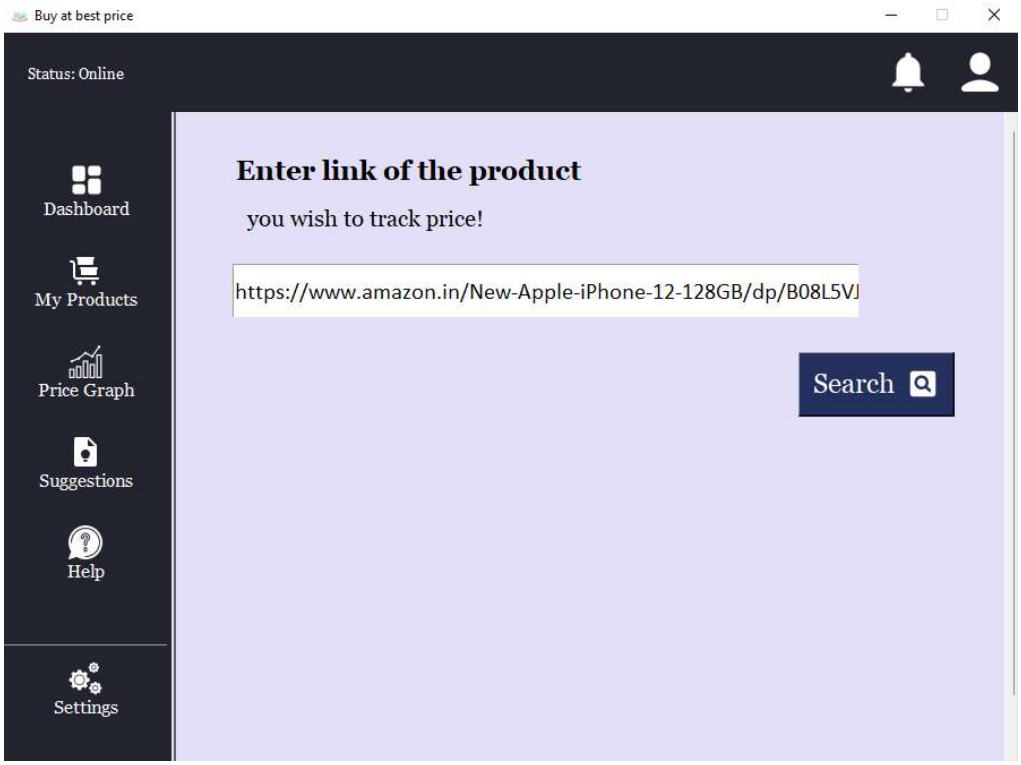


Fig.7.2. Pasting link in Software's link bar.

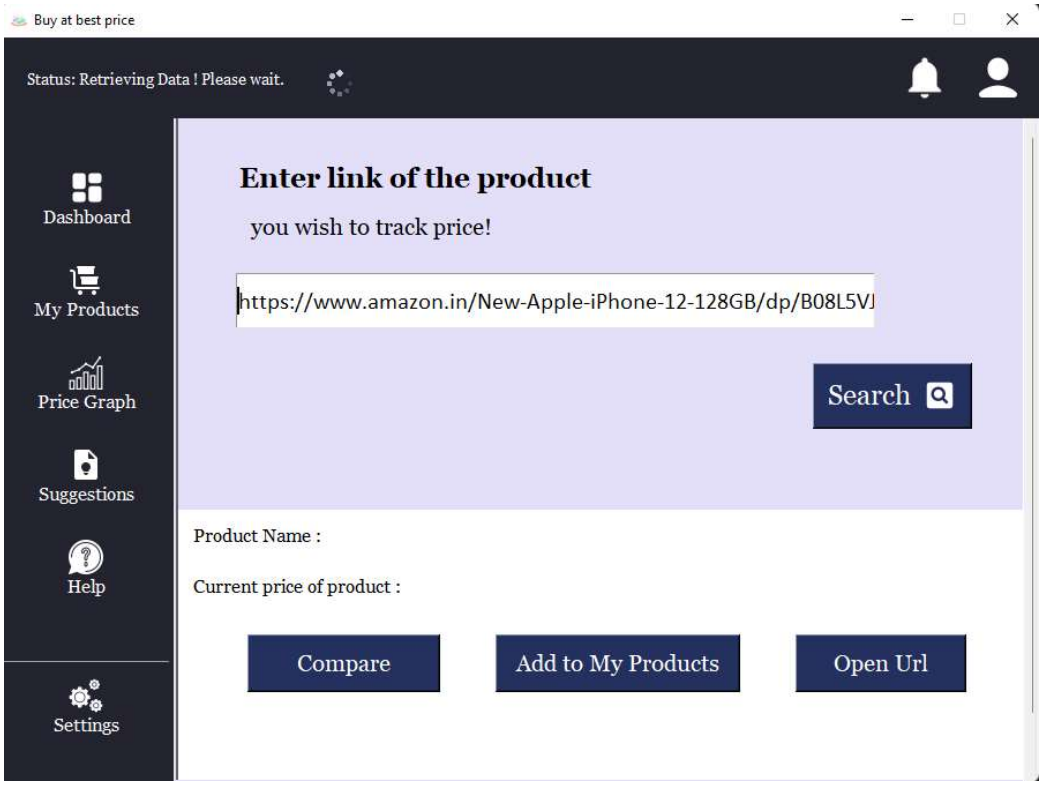


Fig.7.3. Hitting the search Button.

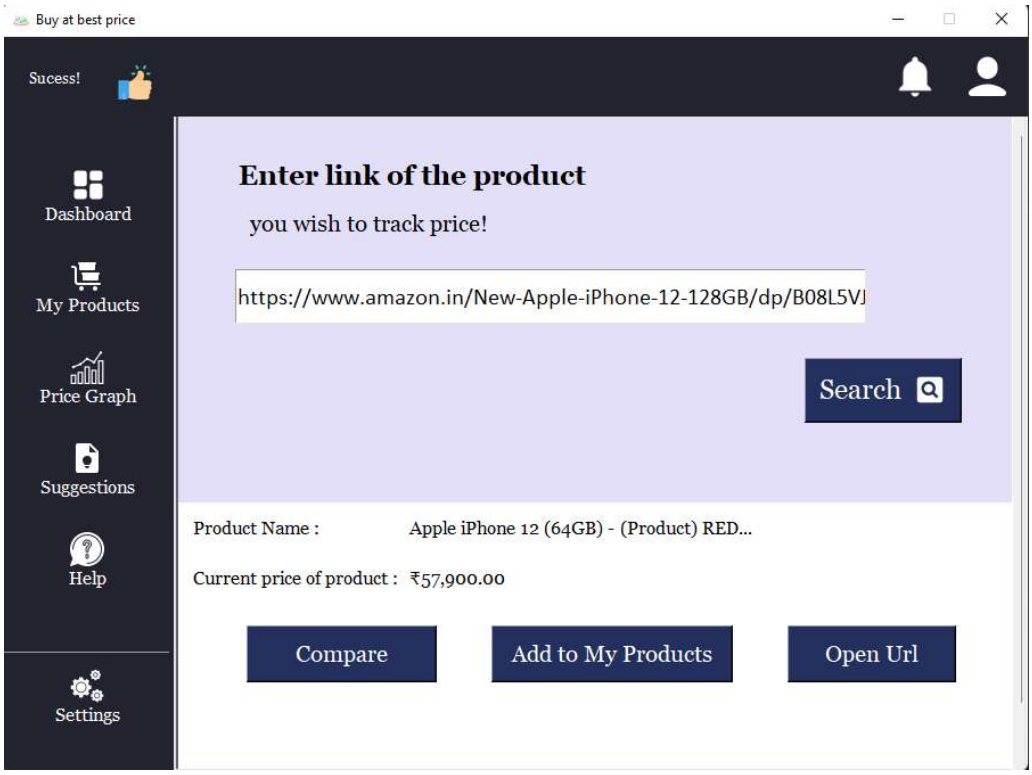


Fig.7.4. Product Name and Price is tracked.

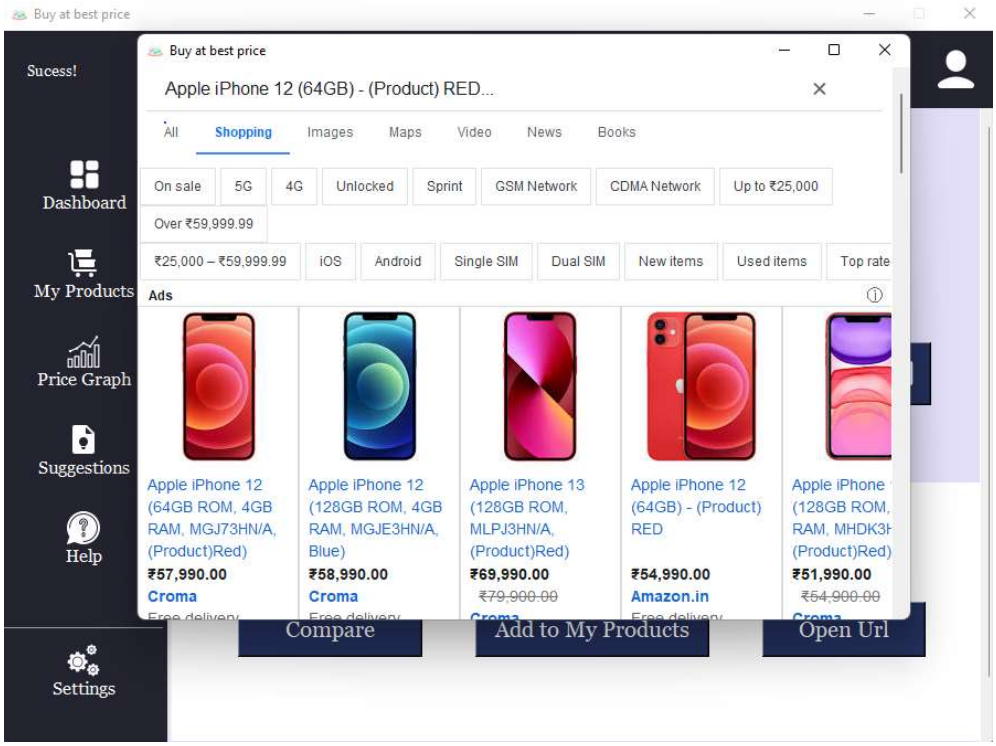


Fig.7.5. Compare Button is clicked.

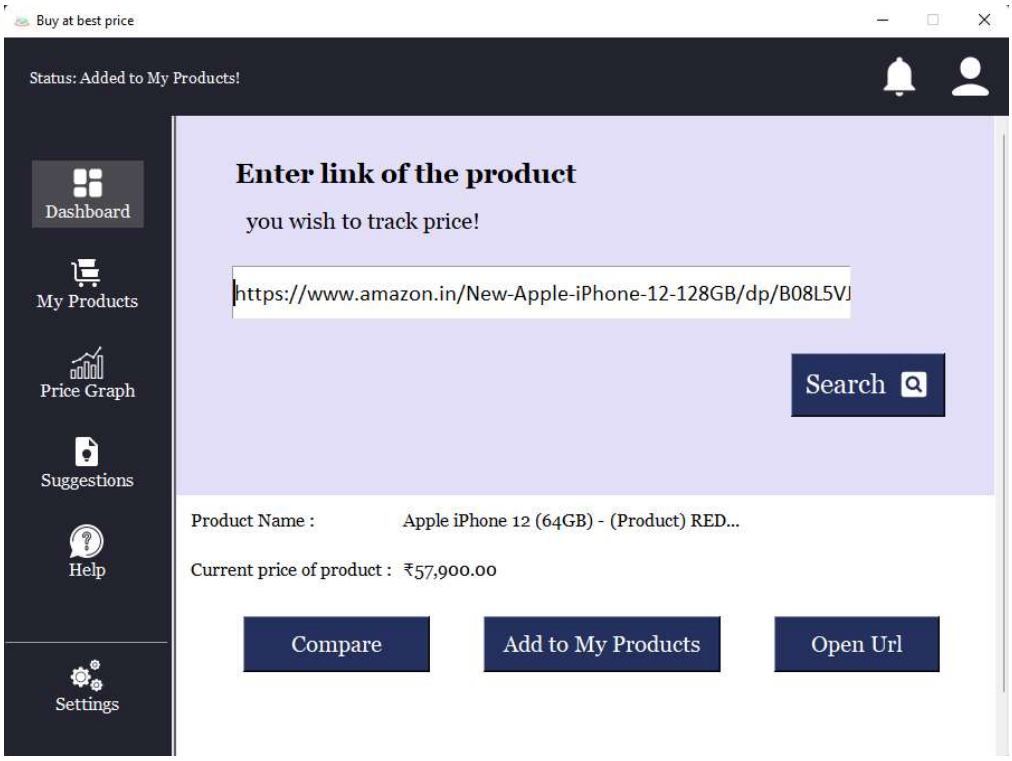


Fig.7.6. Add to My Product is clicked.

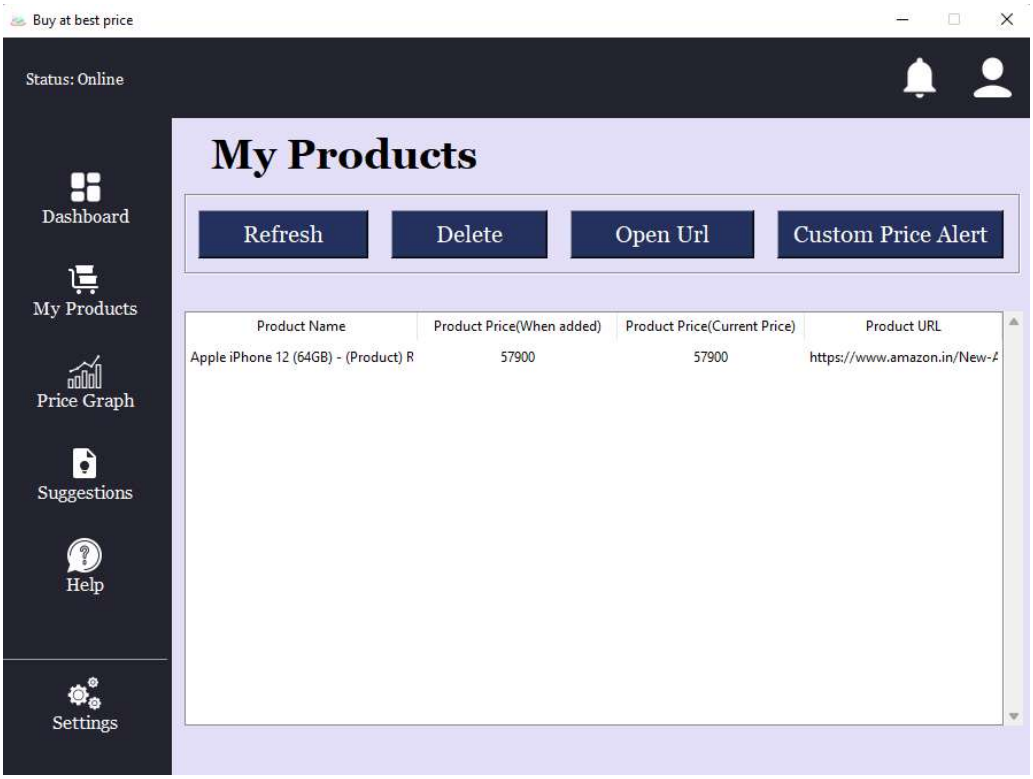


Fig.7.7. Product is added to My Product Section.

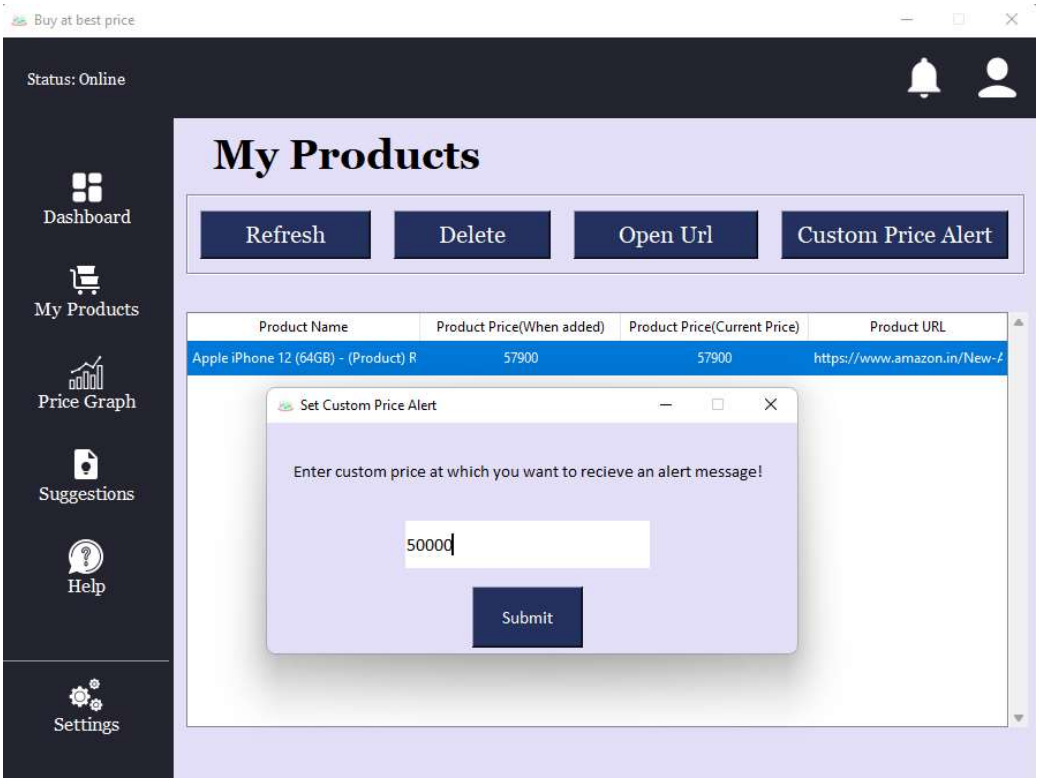


Fig.7.8. Setting Custom Price for Notifications.

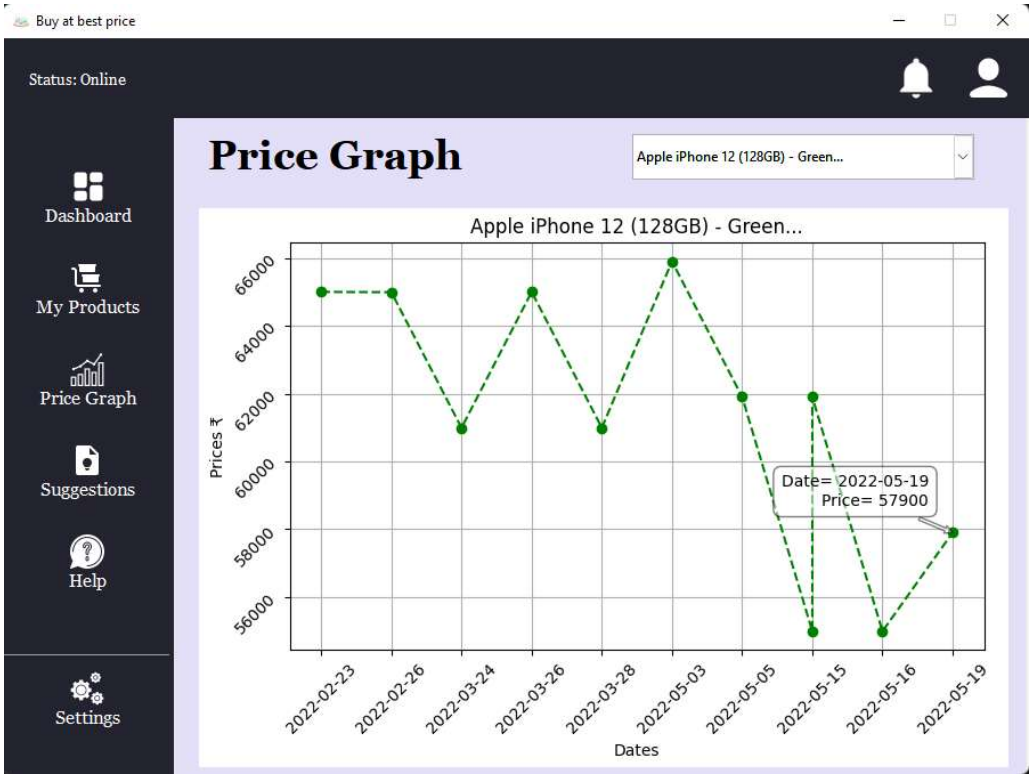


Fig.7.9. Price Graph deflecting price changes (after several days).

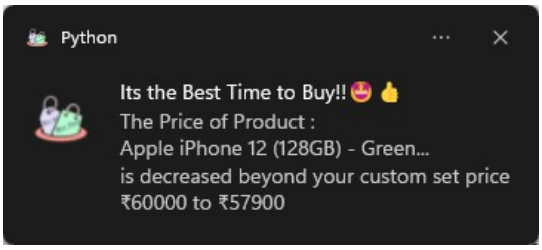


Fig.7.10. Windows Notification about change in Price.

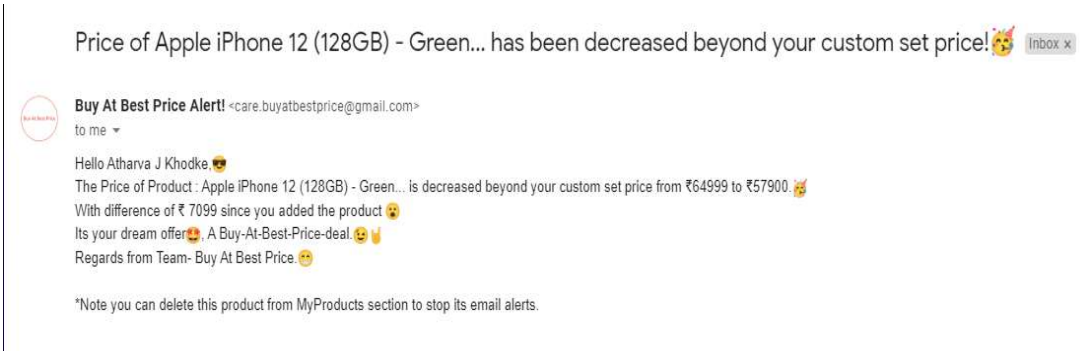


Fig.7.11. Email Notification about change in Price.

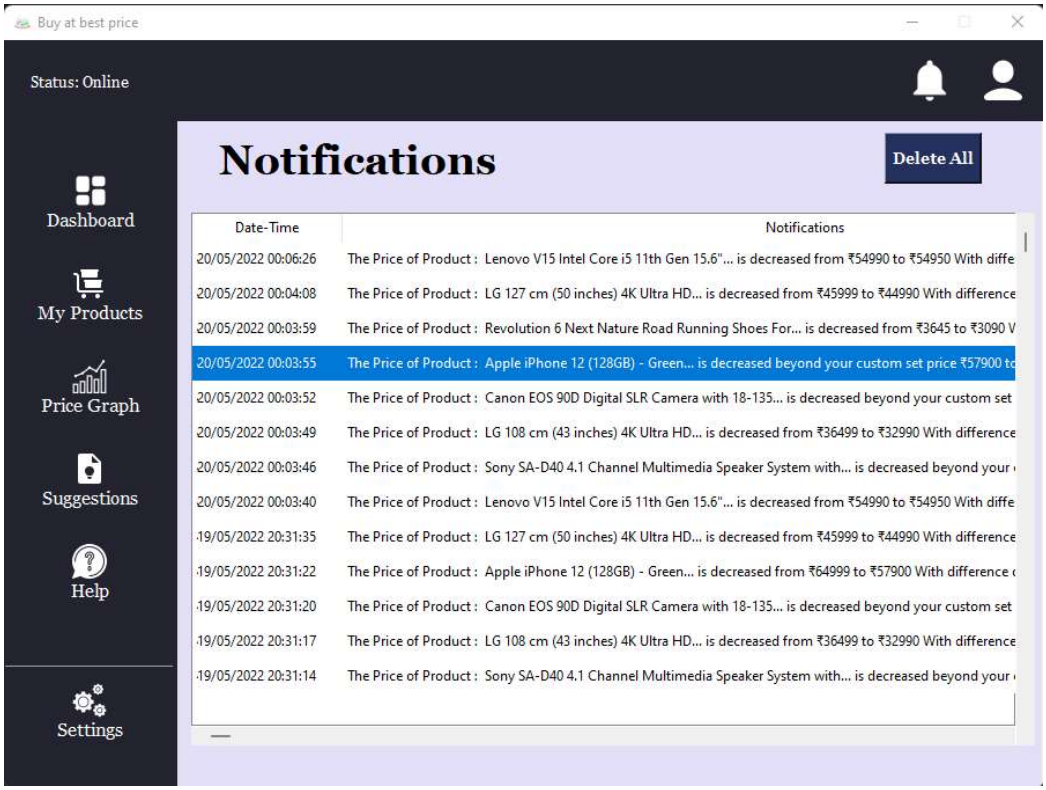


Fig.7.12. Notifications about all product price changes shown.

CHAPTER 8

ADVANTAGES

8.1 The Convenience of Buy At Best Price:

- Saves time and efforts.
- The convenience of shopping at home.
- Wide variety/range of products are available.
- Get detailed information about the product.
- We can compare various models/brands.
- Shows us price-graph by which it become easy to compare price of the product.
- Notify the user wished rate/price of the product.
- Less effort for user as more work will done the software.
- Saves our small sum of money on each of our expenses.
- Beneficial for buying online goods from any websites.

8.2 Advantages of Application:

- **Eliminate mistakes:**

  Excel is the most common method of manually tracking and storing competitor's prices, but you run the risk of making mistakes when transferring data, however careful you think you are. By using a proven competitor price tracking tool, you will eliminate the risk of making what could be extremely costly mistakes.

- **Accelerate your price changes:**

  Price wars can be fierce and for many ecommerce sectors, particularly electronics, home maintenance and construction, prices are highly dynamic. Add to the pot special promotions, discounts, and seasonal sales, and it becomes almost impossible to manually update pricing data on a daily basis.

On the other hand, when you use price tracking software you are monitoring the whole market and the alerts you will set up means you can accelerate your response/adjust your prices dynamically accordingly.

- **Save time:**

  Time is valuable and your day should be spent in a productive fashion, not bogged down in the product prices of your competitors, particularly if we are talking hundreds, perhaps thousands of products here. There are much better ways for you (or your employees) to spend time productively on other areas of business. Let the software trawl the internet for you.

- **Cut costs:**

  The ROI will be realized in a very short space of time. Competitor price tracking software is more effective, accurate and economic than employing someone to track prices.

- **Improve data analysis:**

  You have already saved valuable time and resources, now its turn of improving your data analysis. By investing in price tracking software, you will learn what is the life cycle/stage of your product, whether the product could be cheaper or higher priced in the future; whether price changes should occur regularly or seasonally - and whether discounts or promotions would be appropriate. Price tracking software means you have all the relevant pricing information at your fingertips, and it becomes much easier to make accurate decisions for the future success of your business.

CHAPTER 9

CONCLUSION

The ‘Buy At Best Price’ Application that allows us to track price of product that we wish to buy. It keeps, track on the price of product in real-time, seamlessly in background. It notifies us if the price goes down than a certain limit through windows and email notifications. Thus, giving us opportunity to Buy that product at Best Price. Also, we can add link of multiple products of which we wish to track price and could shortlist them into My Products section.

A price tracker is a technical solution that helps (online) Buyers, track prices of competitors of online websites and dealers. It makes the process of tracking prices easier and less painful, and it also gives information to make pricing decisions. These websites focus on offering the end buyer the best deal.
It will be very beneficial for the user for Online shopping.

CHAPTER 10

REFERENCE

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