

Smart Shopping Companion: Empowering Customers with a Price Negotiating Chatbot

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ABSTRACT_ In most business deals, negotiation is an essential step. To bargain is to negotiate. It's an essential part of any transaction, from a major commercial agreement to buying produce from a street seller. The Growth of E-Commerce The pricing of the goods can be negotiated with the aid of the chatbot project we are working on. All web-based apps prioritise happy customers above all else, and chatbots enable those customers have their problems fixed fast without wasting time sending emails and waiting for a response. By serving as a go-between for the business and the customer, chatbots simplify the process of resolving any number of problems a user might have. Problems in communication and understanding arise during negotiations, and only time and discussion can lead to a satisfactory resolution. A chatbot can help a consumer find exactly what they're looking for when they're having trouble narrowing down their search results.

1.INTRODUCTION

Online shopping and business have exploded in popularity over the past few years. The number of e-commerce platforms and online retailers is growing. Many people now make the vast majority of their regular purchases online instead than at brick-and-mortar establishments. There will be significant repercussions for the brick-and-mortar retail sector as a result of this change to online shopping. Not everyone enjoys shopping in a crowded store, and other individuals simply don't have the time or energy to

make the trip. The alternative is an online shopping system, which might take the form of a virtual store accessible over the Internet, where shoppers can peruse inventory and make purchases. It's possible that difficulties in communication and deductive reasoning both contribute to the negotiation process. To negotiate is to engage in a process of giving and taking that has the greatest potential to fulfil the needs of all parties involved. Everyone enjoys the process of negotiation, therefore it takes up a lot of our time. People see it as a trustworthy way to find a good deal online. If the user is unhappy with the

value presented in a negotiation, the E-Negotiator Chabot can help them find a solution. Users will be able to freely interact with the programme, upload product-related questions together with their budgets, and then quickly and easily locate the answer to their questions with the help of this system.

2.LITERATURE SURVEY

2.1 Ai Based Shopping System for Price Negotiation Using Chatbot System and Computer Science

Presented in this study is a web-based retail solution based on fictitious artificial intelligence. With eighty percent of customers having at least one experience with online purchasing, this presents a golden chance for e-commerce businesses to build a long-term, mutually beneficial connection with a sizable and growing customer base. An alliance of this magnitude calls for in-depth knowledge of the customer as a whole and the ability to make sense of a deluge of real-time data that extends far beyond simple demographics and purchasing patterns. Two users will log in to the system. One is the administrator, while the other is the subscriber. The user can then look at the product's details and decide whether or not to add it to their shopping basket. The user can also ask the AI Bot about the product's

price and specifics, and the Bot will respond with a text-to-speech version of the answer.

2.2 GENIUS: An Integrated Environment for Supporting the planning of Generic Automated Negotiators

In order to assess the efficacy of our agents' design technique, we had engineering majors and minors create prototypes of automated agents. During a tournament, these agents faced off against every other agent twice. After each tournament, the students were only given access to one of GENIUS's two mechanisms (the analytical toolbox or the repositories of domains and agents) and given the opportunity to redesign their agent. This was done to verify the effectiveness of GENIUS's two mechanisms. The two teams met again in a competition with strict pairing rules. Also, after submitting their revised agents, the academics had to evaluate the design process by filling out questionnaires.

3.PROPOSED SYSTEM

Nearly three-quarters of consumers now shop online at least occasionally. However, many websites don't allow customers to negotiate pricing, which could discourage potential buyers. To address this issue, the author of this study

proposes a new tool called the Negotiating Chatbot (NC).

Machine learning algorithms like SVM and KNN are used to train the chatbot, and the resulting model is then used to predict the best prices, which are then suggested to customers by the chatbot; if the customer is unsatisfied with the predicted price, the chatbot applies the maximum discount to the predicted price before suggesting the final price.

If the consumer is happy with the pricing, he can either finalise the order or continue shopping until he finds an appropriate product.

The original price and the negotiated price are both stored in the e-commerce

database, and the machine learning algorithm will learn from both sets of data to forecast the negotiated price. The E-Commerce dataset used to train SVM and KNN for this research is displayed below.

3.1 IMPLEMENTATION

- 1) Signup Here: using this module new user can signup with the application
- 2) User Login: using this module user can login to application
- 3) Browse Products: using this module user can view products catalogue and then select any product and start price negotiating with Chatbot
- 4) If user satisfy with the price then he can confirm order or back to view catalogue again
- 5) View Orders: using this module user can view all products purchased by him

3.2 DATASET INFORMATION

index	Type	Name	Short_description	Images	Price	Negotiate
0	simple	Divi Engine String Bag (Big Logo)	This fashionable string bag is made of 100% cotton. It is the perfect size for carrying your ever			
1	simple	Divi Engine String Bag (Small Logos)	This fashionable string bag is made of 100% cotton. It is the perfect size for carrying your e			
2	variable	Brand Buttons	Represent your favorite CMS, eCommerce Platform, Website Builder, or Plugin Company in style with a cool pi			
3	variation	Brand Buttons - Divi	https://ajax-filters-bc.diviengine.com/sampledata/images/DE-Pins-1.jpg	9.99	8.991	
4	variation	Brand Buttons - Divi Engine	https://ajax-filters-bc.diviengine.com/sampledata/images/DE-Pins-4.jpg	9.99	8.991	
5	variation	Brand Buttons - WooCommerce	https://ajax-filters-bc.diviengine.com/sampledata/images/DE-Pins-2.jpg	9.99	8.991	
6	variation	Brand Buttons - WordPress	https://ajax-filters-bc.diviengine.com/sampledata/images/DE-Pins-3.jpg	9.99	8.991	
7	simple	Lanyard	Stop losing your important access keys with a lanyard that is ALMOST as reliable as Divi Engine plugins!	https://ajax-filte		
8	variable	Divi Engine Tee	This comfortable cotton t-shirt that features the Divi Engine logo on the front is perfect for any occasion. The sh			
9	variation	"Divi Engine Tee - Blue, Large"	https://ajax-filters-bc.diviengine.com/sampledata/images/Shirt-3-blue-front.jpg	14.99	13.491	
10	variation	"Divi Engine Tee - White, Large"	https://ajax-filters-bc.diviengine.com/sampledata/images/Shirt-3-white-front.jpg	14.99	13.491	
11	variation	"Divi Engine Tee - Yellow, Large"	https://ajax-filters-bc.diviengine.com/sampledata/images/Shirt-3-yellow-front.jpg	14.99	13.491	
12	variation	"Divi Engine Tee - Blue, Medium"	https://ajax-filters-bc.diviengine.com/sampledata/images/Shirt-3-blue-front.jpg	14.99	13.491	
13	variation	"Divi Engine Tee - White, Medium"	https://ajax-filters-bc.diviengine.com/sampledata/images/Shirt-3-white-front.jpg	14.99	13.491	
14	variation	"Divi Engine Tee - Yellow, Medium"	https://ajax-filters-bc.diviengine.com/sampledata/images/Shirt-3-yellow-front.jpg	14.99	13.491	
15	variation	"Divi Engine Tee - Blue, Small"	https://ajax-filters-bc.diviengine.com/sampledata/images/Shirt-3-blue-front.jpg	14.99	13.491	
16	variation	"Divi Engine Tee - White, Small"	https://ajax-filters-bc.diviengine.com/sampledata/images/Shirt-3-white-front.jpg	14.99	13.491	
17	variation	"Divi Engine Tee - Yellow, Small"	https://ajax-filters-bc.diviengine.com/sampledata/images/Shirt-3-yellow-front.jpg	14.99	13.491	
18	variable	Divi Tee	This comfortable cotton t-shirt features the Divi logo on the front and back. It is the perfect tee for any oc			
19	variation	Divi Tee - Large	0.0	14.99	12.99	
20	variation	Divi Tee - Medium	0.0	14.99	12.99	
21	variation	Divi Tee - Small	0.0	14.99	12.99	
22	variable	WordPress Tee	This comfortable cotton t-shirt features the WordPress logo on the front and back. It is the perfect tee for any oc			
23	variation	WordPress Tee - Large	0.0	14.99	12.99	

Fig 1:In above dataset first row contains dataset column names and remaining rows contains dataset values and below screen showing code for reading dataset and then training with SVM and KNN to predict prices

```
if request.method == 'GET':
    global original_price, predicted_price, final_price, product_name, product_id
    product_id = request.args.get('id') #user will select product for which he want negotiate
    dataset = pd.read_csv("Dataset/model.csv") #read dataset
    dataset.fillna(0, inplace = True) #replace missing values in dataset with 0
    products = dataset.loc[dataset['index'] == product_id] #read all rows from dataset which is matches with user selected product
    products = products.values #convert dataframe to array
    print(products)
    original_price = products[0,5] #get original price from dataset
    product_name = products[0,2] #get product name from dataset
    X = products[:,5:6] #get original prices as X training data
    Y = products[:,6:7] #get negotiating prices as Y data
    sc = MinMaxScaler(feature_range = (0, 1)) #can be used to normalize dataset
    X = sc.fit_transform(X) #normalize the X values
    Y = sc.fit_transform(Y) #normalize the Y values
    svr_regression = SVR(C=1.0, epsilon=0.2) #create SVM object
    #training SVR with X and Y data
    svr_regression.fit(X, Y.ravel()) #trained SVM with X and Y data
    #performing prediction on test data
    predict = svr_regression.predict(X) #perform prediction to get best price
    predict = predict.reshape(predict.shape[0],1)
    predict = sc.inverse_transform(predict)
    predict = predict.ravel()
    labels = sc.inverse_transform(Y)
    labels = labels.ravel()

    knn = KNeighborsRegressor(n_neighbors=2) #here we are training with KNN
    #training KNN with X and Y data
    knn.fit(X, Y.ravel())
    #performing prediction on test data
    predict = knn.predict(X)
    predict = predict.reshape(predict.shape[0],1)
    predict = sc.inverse_transform(predict)
    predict = predict.ravel()
    labels = sc.inverse_transform(Y) #back to original values from normalization
    labels = labels.ravel()
    predicted_price = predict[0] #get best predicted price
    output = "Hi! this is Nego.<br/>Your selected Product : "+product_name+"<br/>Its Current Price : "+str(original_price)+"<br/>"
    return render_template('Chatbot.html', msg=output)
```

Fig 2: In above screen read red colour comments to know about training dataset with KNN and SVM to get predicted prices. Chatbot will use this algorithms to get predicted prices and application will use Artificial Intelligence algorithm to help Chatbot identify user messages like FINAL PRICE, FIRST PRICE etc. if user ask unrelated question then Chatbot will throw error.

4.RESULTS AND DISCUSSION

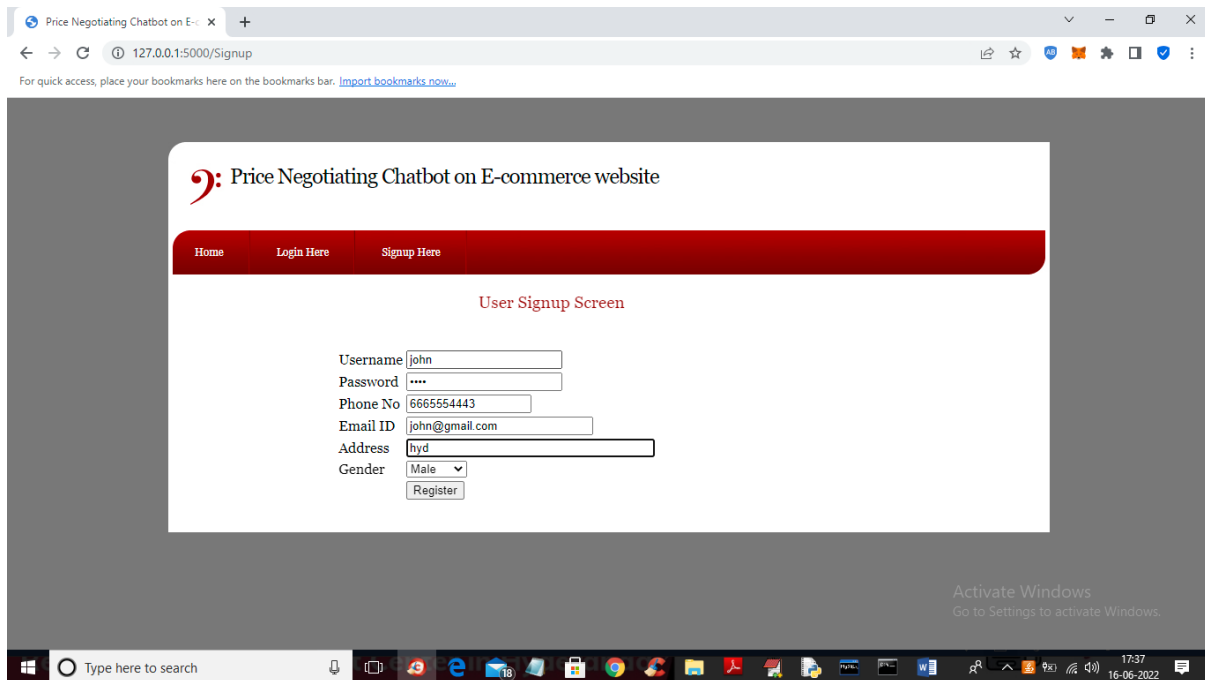


Fig 3:In above screen user can enter signup details and press button to get below output

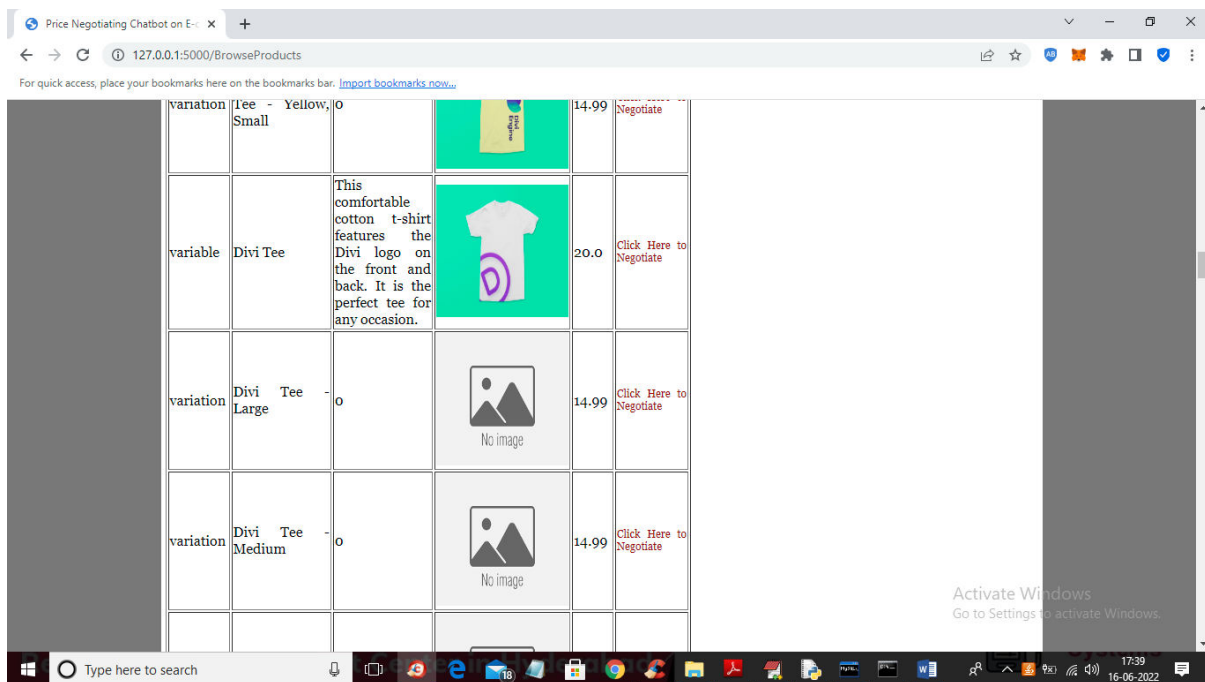
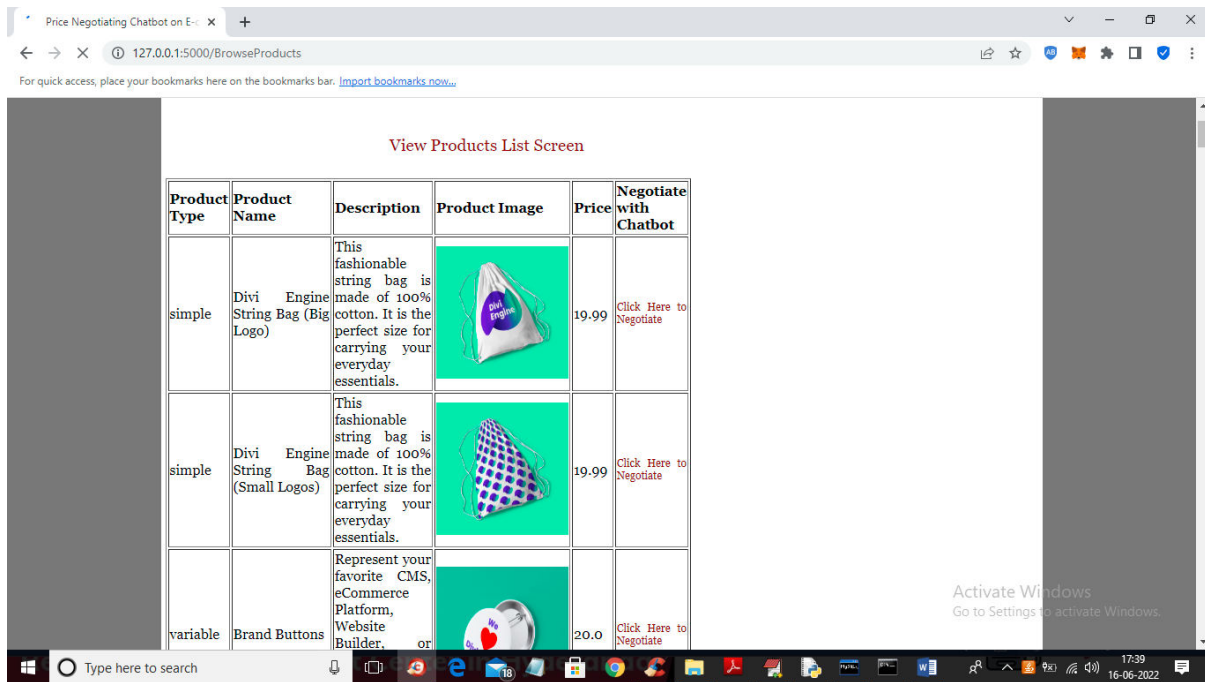


Fig 4:In above screen user can click on ‘Click Here to Negotiate’ link to get below chat bot screen

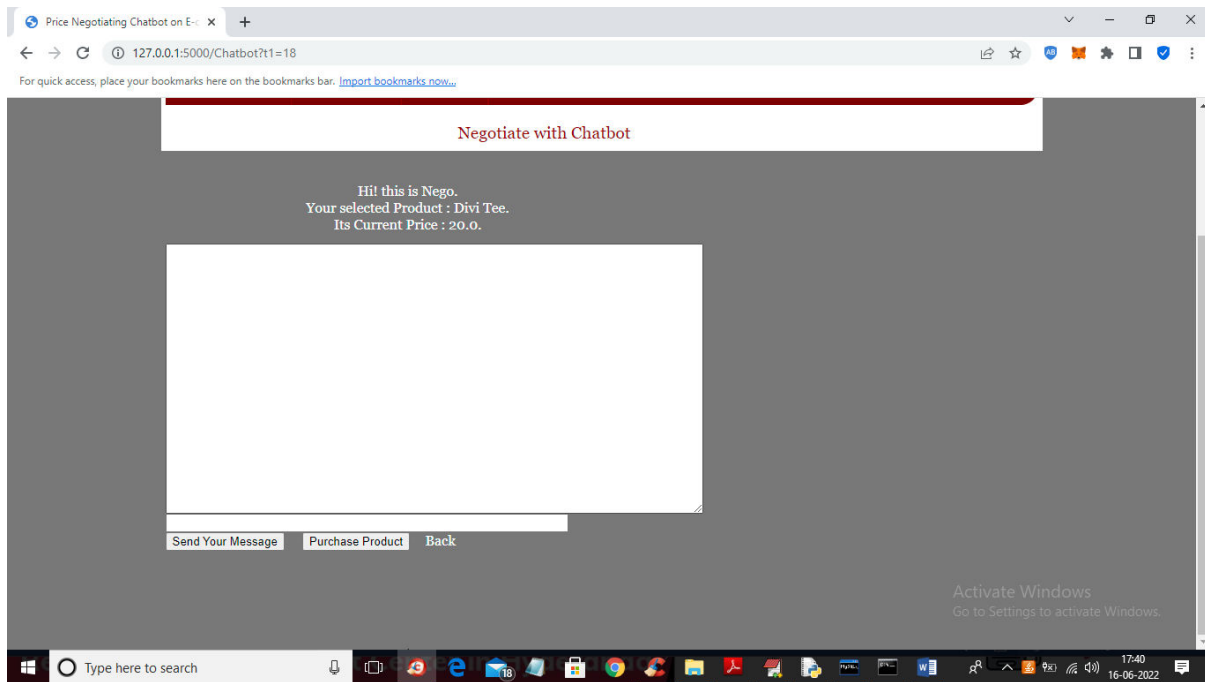


Fig 5:In above screen in white colour text Chatbot will display all products details with current price and now user can enter command like ‘first price’ or ‘price’ to get negotiate price from Chatbot using ML algorithms

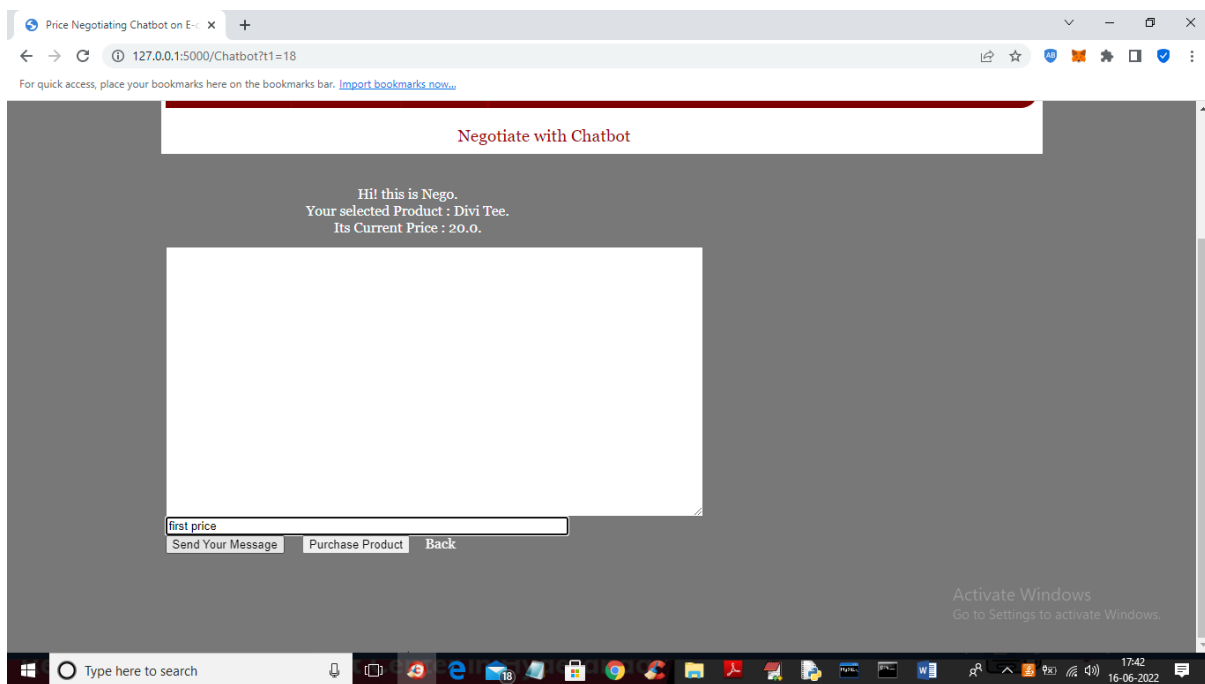


Fig 6:In above screen in text field I entered text as ‘first price’ and press ‘Send Your Message’ button to get below output

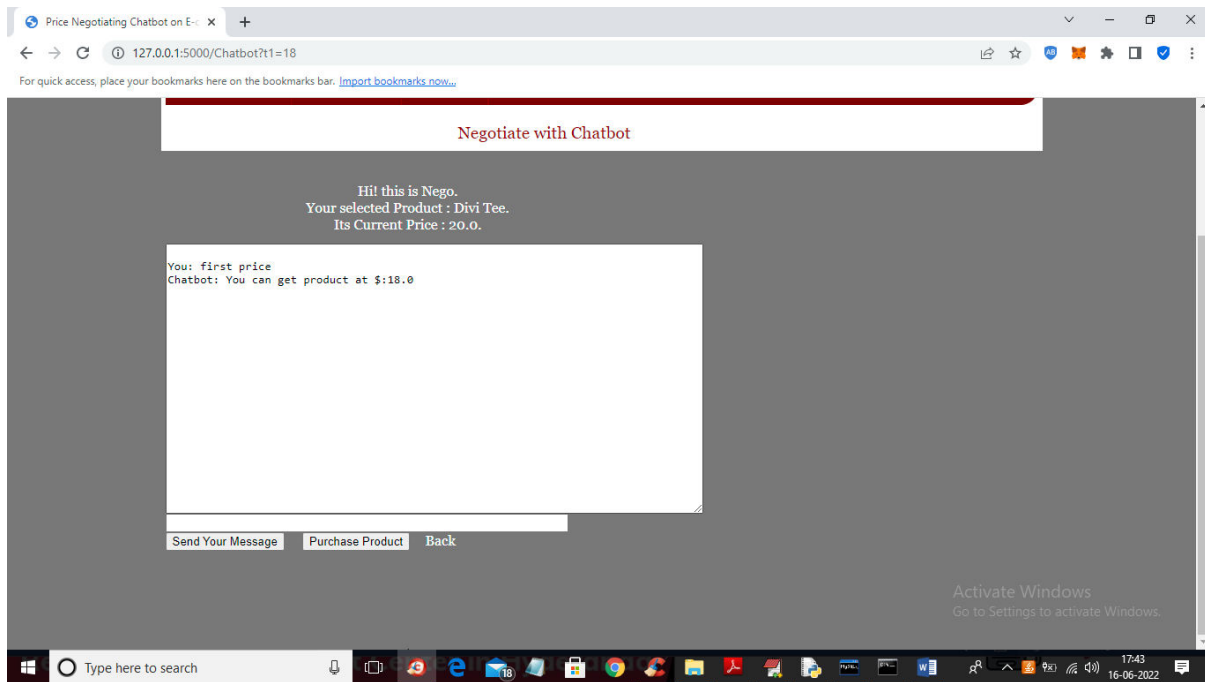


Fig 7:In above screen in text area Chatbot returned predicted price and if customer not satisfy he can ask for final price to get below output

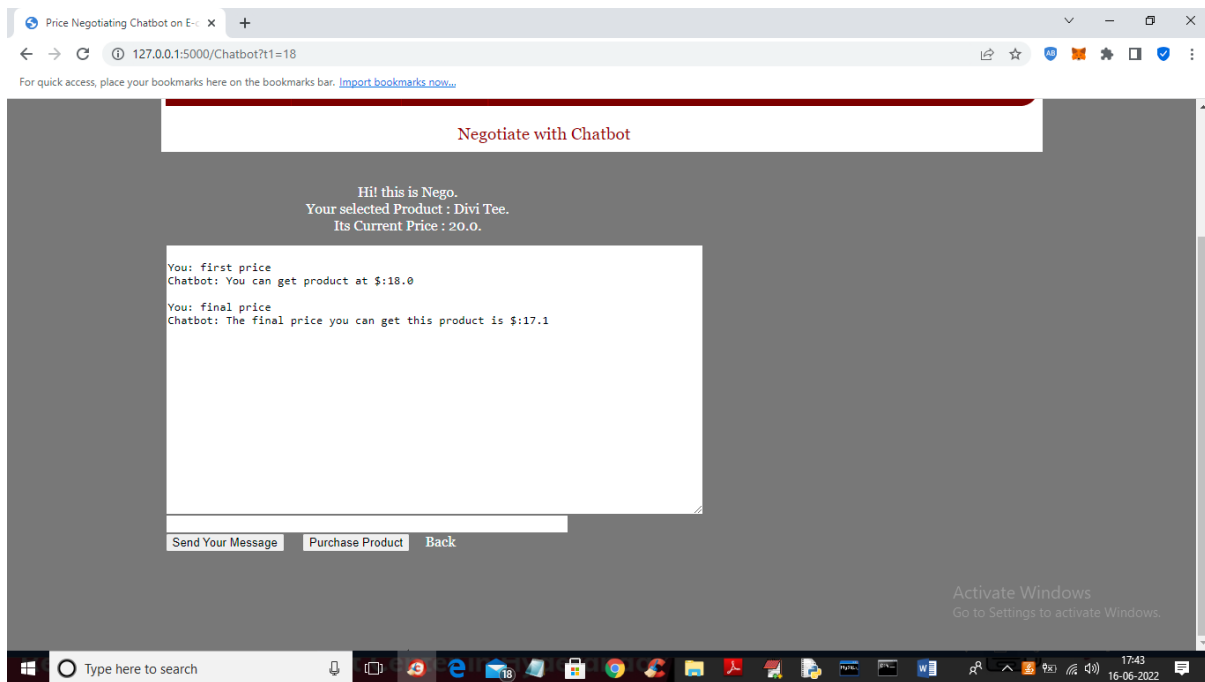


Fig 8:In above screen Chatbot returned final price after entering message as ‘final price’ and now if customer satisfy then he can click on ‘Purchase Product’ button to confirm order or click on ‘Back’ link to get catalogue again

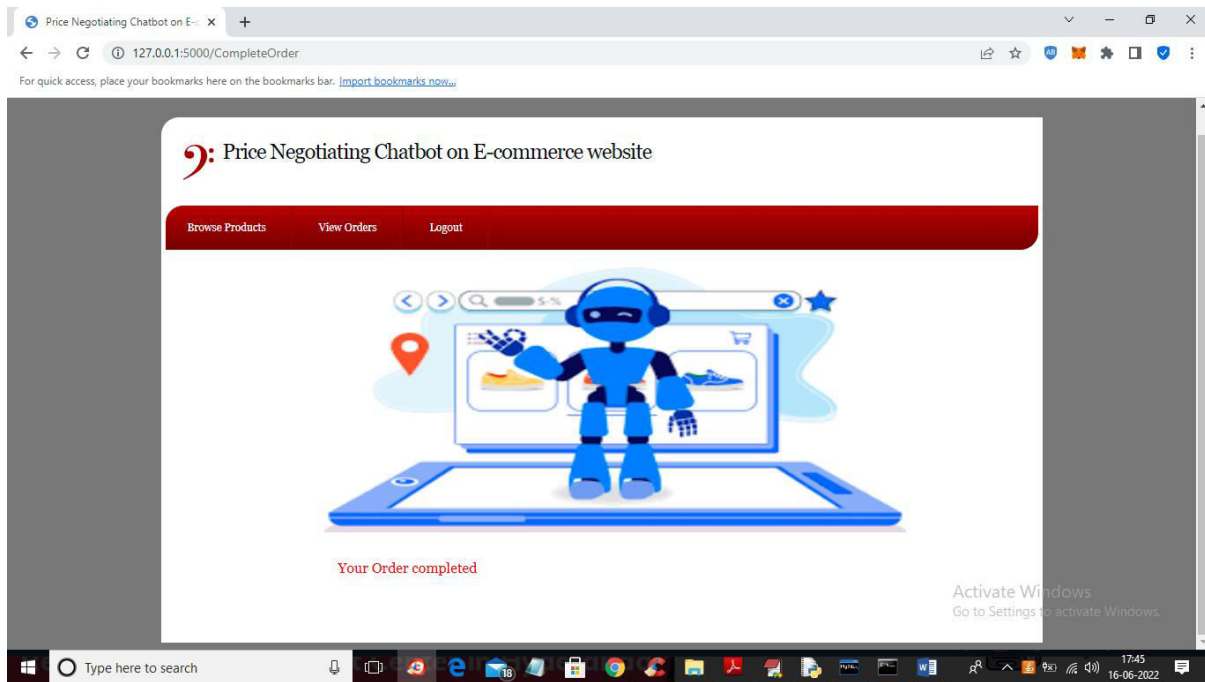


Fig 9:In above screen after purchasing product I got message as ‘Your order confirmed’ and now user can click on ‘View Orders’ link to view all his orders like below screen

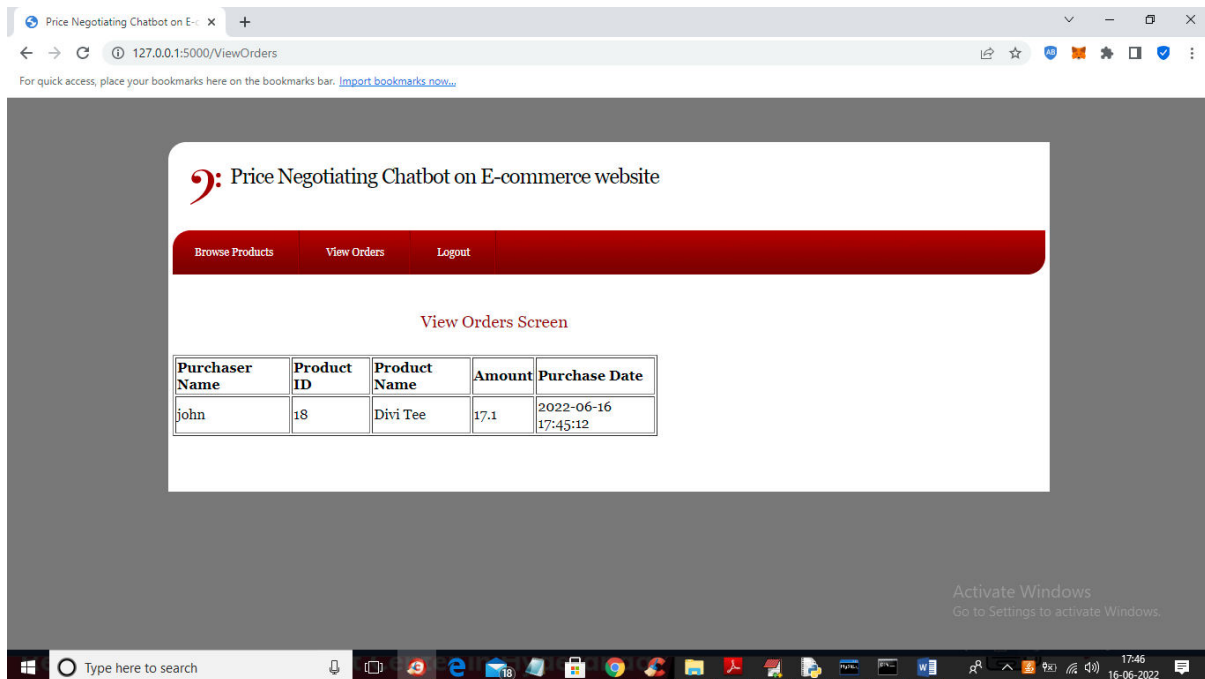


Fig 10:In above screen user can view purchased products list. Similarly you can choose any product and negotiate with Chatbot and confirm order.

5.CONCLUSION

Selecting a product and initiating a discussion on negotiation with a chatbot is

what a consumer does if they are unhappy with the production budget offered by the e-commerce site. The machine can

determine the tag word from the query. The system then provides an answer to the user based on the tag used in the inquiry. At first, the bot will suggest other products at the chosen price point, as well as a comprehensive offer. When a user's question has been answered by a chatbot, they can select an offer to see how it stacks up against the baseline cost. If the user's preferred price is higher than the minimum price, the contract is accepted; otherwise, a lower price is offered through negotiation. If the newly discounted price is lower than the minimal value, the chatbot will offer the customer the lower amount.

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