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EDU COUNSELOR: CAREER COUNSELING CHATBOT

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Abstract—**The Career Counseling web application is a game-changing platform developed to help 10th and 12th grade students make informed career decisions. It addresses the ongoing problem of students choosing bad career choices due to family pressure and lack of understanding. Current students exhibit a great need for alternate job pathways as well as thorough college and course information. This app provides a one-stop shop for students, with features such as extensive college and course information, travel directions, and evaluation quizzes to gauge their interests. Furthermore, through a dedicated forum, it provides critical insights for competitive exams and stimulates discussions on technical themes. A unique College Prediction tool assists students in selecting an institution, and a Counseling Chatbot provides real-time help. The emergence of conversational agents (CAs) or "Chatbots" in major digital organizations and startups highlights their importance in improving user experiences through the use of Artificial Intelligence (AI). However, issues remain in comprehending human interactions and different user needs, which are addressed by Machine Learning (ML), which includes Supervised and Unsupervised learning. The Career Counseling web application is a creative solution that demonstrates how technology can transform education, empower students, and contribute to a brighter future.**

Keywords—**Career Counseling, Web Application, Chatbot, Artificial Intelligence (AI), Machine Learning (ML), Natural Language Processing (NLP).**

I. INTRODUCTION

Individuals frequently face the problem of making informed career decisions in today's fast-paced and ever-changing employment environment. This chatbot delivers personalized career counsel and help to individuals seeking professional direction by leveraging artificial intelligence and natural language processing. The Career Counselling Chatbot can help you whether you're a new graduate exploring your career alternatives or a mid-career professional looking to transfer fields. It provides a quick and accessible platform for career-related inquiries, guaranteeing that users receive individualized advice and recommendations based on their specific experiences and goals. This chatbot eliminates geographical and time boundaries, making employment advice available to a global audience 24 hours a day, seven days a week. It enables individuals to make well-informed and confident employment decisions in a fast changing job landscape by providing extensive, up-to-date information and support. The rest of the paper is organized as follows. Proposed embedding and extraction algorithms are explained in section II. Experimental results are presented in section III. Concluding remarks are given in section IV.

II. LITERATURE SURVEY

● Kohli, Bhaumik, T. Choudhury, S. Sharma, and P. Kumar, "A platform for human-chatbot interaction using python," in 2018 IEEE Second International Conference on Green Computing and Internet of Things (ICGCIoT), pp. 439-444, 2018. As numerous chatbot platforms already exist, there are still some problems in building a data-driven system because a huge amount of data is required for its development. Thus, this paper describes various such agents which depend upon natural expressions implemented in Python.

● REACH: A Guidance and counselling Support System. 2022 5th International Conference on Information and Computer Technologies (ICICT) The goal of this paper is to provide aid to the Centre for Guidance and counselling Office in a University. This project caters to some of the services offered by the Guidance and counselling Offices, providing decision making aid for the counsellor in accordance with current laws implied for Guidance counselling.

● Crystal D'Mello "Online Career Guidance System", In International Journal of Advanced Research in Computer Science and Software Engineering Career development is a lifelong process. There are a number of factors that influence your career development, including your interests, abilities, values, personality, background, and circumstances. Career Guidance will help you to know and understand yourself and the world of work in order to make career, educational, and life decisions.

III.PROBLEM STATEMENT

Students in grades 10 and 12 are frequently confronted with the tough issue of deciding on a career path. This might be a difficult decision to make because it will have a huge impact

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on their future. Chatbots for career counseling have the potential to change the way students choose a career path. Chatbots can assist students in making educated decisions about their future by providing personalized recommendations and information. The capacity of career counseling chatbots to personalize recommendations is one of its primary advantages. Chatbots can establish a detailed grasp of each student's particular needs by asking them a series of questions about their interests, abilities, and preferences. Chatbots may now give kids with a list of employment possibilities that are tailored to their own strengths and interests. Overall, career counseling chatbots have the potential to have a substantial impact on how students choose a career route after their tenth or twelfth grades. Chatbots can assist students in making informed decisions about their future by giving personalized advice, information, and 24/7 accessibility. 4.1.1

IV. GOALS AND OBJECTIVES

Goal : A career counseling chatbot has the potential to revolutionize the way students choose a career path. Chatbots can assist students make informed decisions about their future by delivering personalized recommendations and information. They are a realistic choice for all students because they provide personalized advice, are available 24/7, and are low-cost to use.

Objective :

● To deliver personalized job recommendations to students, the chatbot should use the information provided by the students to build a list of career alternatives that are well-suited to their specific needs.

● Toeducate students about various jobs: The chatbot should inform students about various careers, including educational and training needs, job outlook, and income expectations.

● To respond to students' inquiries regarding careers and the process of selecting a career path: The chatbot should be able to answer students' questions about specific jobs as well as general questions about choosing a professional path.

● To make career counseling more accessible and cheap, the following steps should be taken: All students, regardless of geography or financial resources, should have access to the chatbot. 4.1.2 Statement of scope

● Inquiring about interests, skills, and preferences: The chatbot would inquire about students' interests, skills, and preferences. This data would then be utilized to recommend various career paths.

● Career information: The chatbot would present students with information about various vocations, such as educational and training needs, job outlook, and income expectations.

● Answering questions: The chatbot would respond to students' inquiries about various jobs as well as the process of selecting a career path.

● It is meant to enhance human counseling by offering users with career advice and guidance 24 hours a day, seven days a week.

V. METHODOLOGIES OF PROBLEM SOLVING AND EFFICIENCY ISSUES

● Methodologies User-Centric Design: Prioritize user research to discover the specific needs, interests, and pain areas of those seeking career counseling. Design the chatbot's features, content, and interactions with the user in mind.

Iterative Development: Use iterative development to allow for continuous improvement. Collect feedback from users and career experts to improve the functionality and content of the chatbot over time.

NLP (Natural Language Processing): Use modern NLP techniques to efficiently interpret and reply to user queries. Refine the chatbot's language models on a regular basis to increase its conversational abilities.

Security and privacy: Integrate strong security measures to safeguard user data and protect data privacy. Audit and update security processes on a regular basis to address evolving risks.

● Efficiency Issues to Address

Reaction Time: Optimize the chatbot's reaction time to give users timely and efficient support. Reduce latency in user interactions to improve overall user experience.

Scalability: Consider the chatbot's scalability in order to handle an expanding user base. Ascertain that the system can manage additional demand without compromising performance.

Data Management: Manage data storage and retrieval procedures efficiently, such as data indexing, caching, and compression, in order to reduce processing time and resource usage.

User Interface Responsiveness: Make sure the chatbot's user interface is responsive and efficient, delivering a seamless and engaging user experience with no delays or lag

VI.PROPOSED ALGORITHM

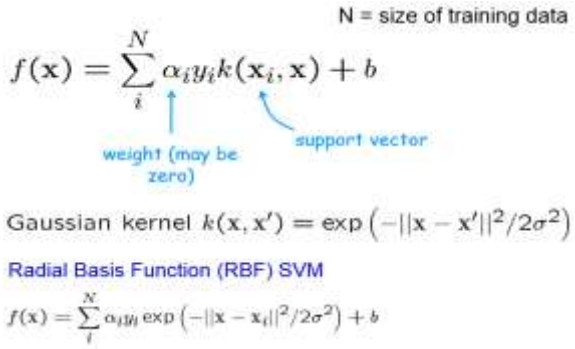
A. **Support Vector Machine**

Support Vector Machine or SVM is the most commonly used machine learning algorithm for labelled data i.e. Supervised Learning. This classification is widely used to handle multi-classification problems. Note that we have created our own dataset by collecting samples using forms, surveys and rigorous interactions. Following steps have been followed to implement SVM on Arts_dataset.

1) Step 1 - Fit svm classifier using sklearn library

2) Step 2 - Making a non-linear algorithm for a model. Default kernel RBF has been selected. RBF stands for Gaussian Radial Basis function. It has been used as we have very little knowledge about our dataset. Mathematical formula for RBF is –

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3) Step 3 - Train the non-linear model.
4) Step 4 - Predict from the trained model
5) Step 5 - Model evaluation via conclusion matrix and accuracy

B. Decision Tree Classifier

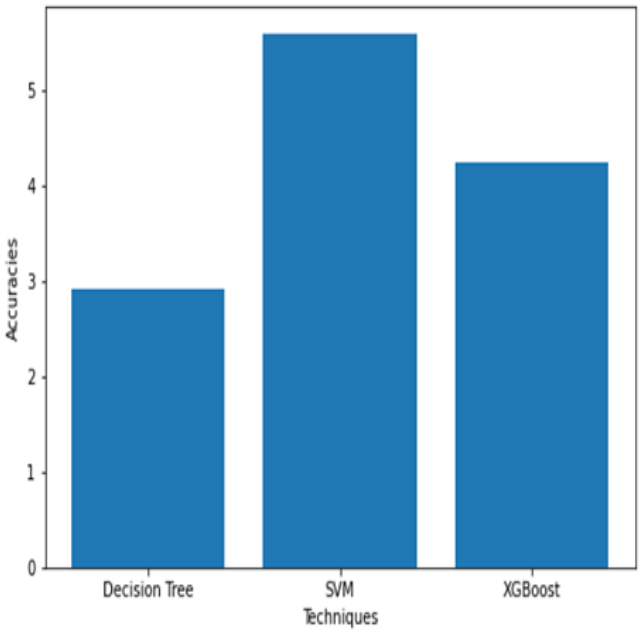
Decision tree is a supervised learning algorithm to deal with large datasets in order to predict an output. It uses multiple features to split and form a tree. Following steps have been followed to implement the Decision tree on Arts dataset –
Step 1 - Load required modules and libraries
Step 2 - Split the dataset into training-testing data. Testing data is 25% of the total dataset.
Step 3 - Import DecisionTreeClassifier from sklearn to make a model. Create an instance of the class to fit the training data to the model.
Step 4 - Predict from the tree.
Step 5 - Model evaluation via conclusion matrix and accuracy.

VII. EXPERIMENT AND RESULT

```
#Support Vector machine
from sklearn.metrics import confusion_matrix,accuracy_score
def svm(X_train,y_train,X_test,y_test):
from sklearn.svm import SVC
from pandas import read_csv
from sklearn.model_selection import train_test_split
 # import metrics to compute accuracy
from sklearn.metrics import accuracy_score
svc=SVC()
# fit classifier to training set
svc.fit(X_train,y_train)
# make predictions on test set
y_pred=svc.predict(X_test)
# compute and print accuracy score
print('Model accuracy score with default hyperparameters: {0:0.4f}'. format(accuracy_score(y_test, y_pred)*100))
return accuracy_score(y_test, y_pred)*100

#Decision Tree classifier
def Dec_tree(X_train,y_train,X_test,y_test):
from sklearn import tree
clf = tree.DecisionTreeClassifier()
clf = clf.fit(X_train, y_train)
# Prediction
y_pred = clf.predict(X_test)
y_test_arr=y_test['role']
from sklearn.metrics import confusion_matrix,accuracy_score
accuracy = accuracy_score(y_test,y_pred)
print('Model accuracy score with Decision Tree',
accuracy_score(y_test, y_pred)*100)
return accuracy*100,clf

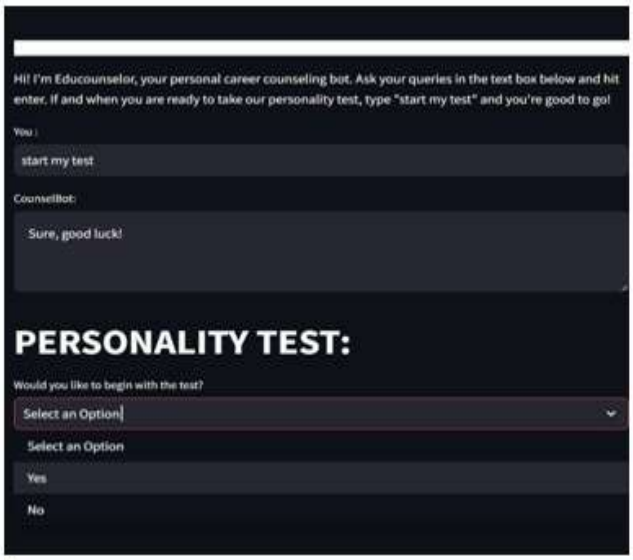
#Xgboost
def xgboost(X_train,y_train,X_test,y_test,clf):
#X_train,X_test,y_train,y_test=train_test_split(X1,y,test_size
=0.3,random_state=10)
shape = X_train.shape
X_train=pd.to_numeric(X_train.values.flatten())
X_train=X_train.reshape(shape)
from xgboost.sklearn import XGBClassifier
model = XGBClassifier()
model.fit(X_train, y_train)
xgb_y_pred  = clf.predict(X_test)
xgb_accuracy = accuracy_score(y_test,xgb_y_pred)
print("accuracy=",xgb_accuracy*100)
return xgb_accuracy*100
```

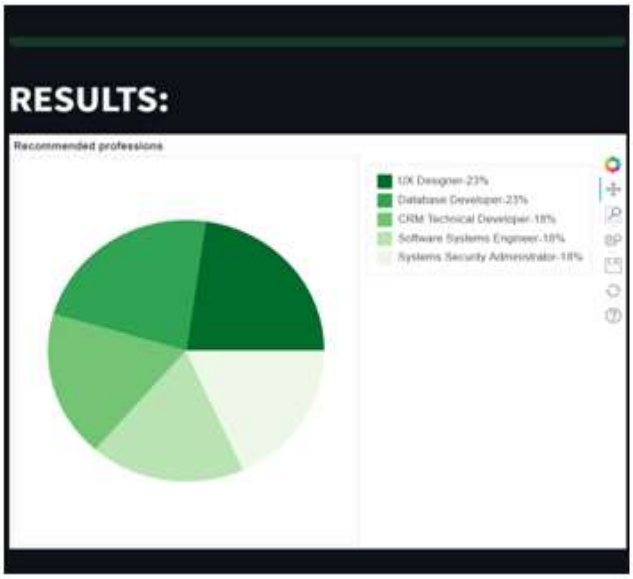


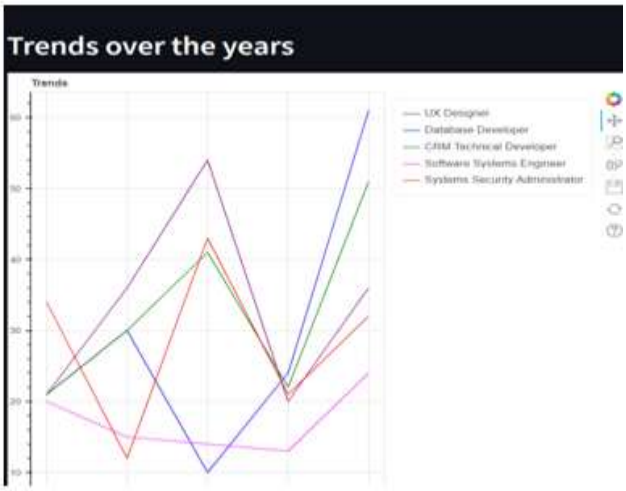
SVM has highest Accuuracy and hence is best suited

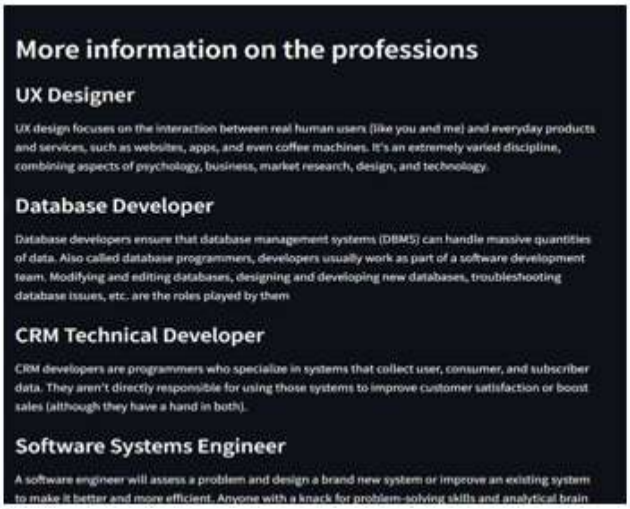
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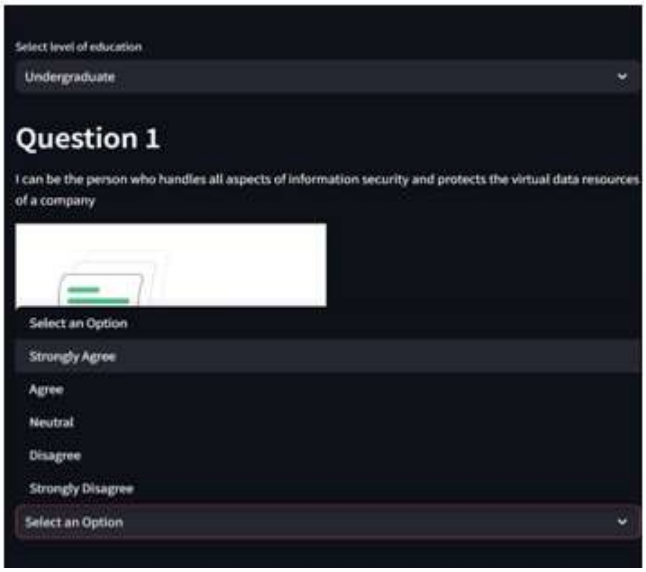
Table -1 Experiment Result













VIII. CONCLUSION

The project "Edu Counsellor: Career Counselling Chatbot" offers a novel and beneficial solution to the significant issues that students confront when making career decisions. The chatbot provides personalized career advice and recommendations by leveraging artificial intelligence (AI), natural language processing (NLP), and machine learning (ML). This project intends to empower students by providing them with information about career opportunities, school requirements, and more. The chatbot's easy-to-use interface and 24-hour availability make it a useful and accessible tool for students at various levels of their academic and professional careers. To assure the chatbot's functionality, performance, and data protection, the project emphasizes the necessity of user-centric design, iterative development, and robust security measures. It emphasizes the importance of performance optimization, scalability, and responsive user interfaces in improving user experience.

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