A

Major Project On

STUDENTS PERFORMANCE PREDICTION IN ONLINE COURSES USING MACHINE LEARNING ALGORITHMS

(Submitted in partial fulfillment of the requirements for the award of Degree)

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE AND ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CMR TECHNICAL CAMPUS

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2020-2024

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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CERTIFICATE

This is to certify that the project entitled "**STUDENTS PERFORMANCE PREDICTION IN ONLINE COURSES USING MACHINE LEARNING ALGORITHMS**" being submitted by **ALAMPALLY SANTHOSHA (207R5A05J1), YAPAKAYALA RAJENDAR (207R1A05P8) & BANNUNU SAHITHI(207R1A05J9)** in partial fulfillment of the requirements for the award of the degree of B.Tech in Computer Science and Engineering to the Jawaharlal Nehru Technological University Hyderabad, is a record of bonafide work carried out by them under our guidance and supervision during the year 2023-24.

The results embodied in this thesis have not been submitted to any other University or Institute for the award of any degree or diploma.

Najeema Afrin
(Assistant Professor)
INTERNAL GUIDE

Dr. A. Raji Reddy
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Dr. K. Srujan Raju
HOD

EXTERNAL EXAMINER

Submitted for viva voice Examination held on _________

ACKNOWLEDGEMENT

Apart from the efforts of us, the success of any project depends largely on the encouragement and guidelines of many others. We take this opportunity to express our gratitude to the people who have been instrumental in the successful completion of this project.

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ABSTRACT

Advances in Information and Communications Technology (ICT) have increased the growth of Massive open online courses (MOOCs) applied in distance learning environments .Various tools have been utilized to deliver interactive content including pictures, figures, and videos that can motivate the learners to build new cognitive skills. High ranking universities have adopted MOOCs as an efficient dashboard platform where learners from around the world can participate in such courses. The students learning progress is evaluated by using set computer marked assessments. In particular, the computer gives immediate feedback to the student once he or she completes the online assessments. The researchers claim that student success rate in an online course can be related to their performance at the previous session in addition to the level of engagement. Insufficient attention has been paid by literature to evaluate whether student performance and engagement in the prior assessments could affect student achievement in the next assessments.

In this project, two predictive models have been designed namely students assessments grades and final students performance. The models can be used to detect the factors that influence students learning achievement in MOOCs. The result shows that both models gain feasible and accurate results. The lowest RSME gain by RF acquire a value of 8.131 for students assessments grades model while GBM yields the highest accuracy in final students performance, an average value of 0.086 was achieved.

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1.INTRODUCTION

1.1 PROJECT SCOPE

The scope of our project involves developing a system to predict students performance in online courses using machine learning algorithms. We will collect and analyze relevant data from online learning platforms, including student demographics, academic history, and course interactions. Our focus will be on building accurate predictive models that can assist educators in identifying at-risk students early and providing targeted interventions to improve their learning outcomes.

1.2 PROJECT PURPOSE

The purpose of our project is to develop a system that can predict students performance in online courses using machine learning algorithms. By analyzing various data points such as student demographics, academic history, and course interactions, our goal is to create accurate predictive models. These models will help educators identify students who may be at risk of struggling in their online courses early on, allowing for timely interventions and support. Ultimately, our project aims to enhance the quality of online education by providing educators with valuable insights to improve student outcomes and foster a more personalized learning experience.

1.3 PROJECT FEATURES

The project encompasses several key features aimed at predicting students performance in online courses using machine learning algorithms. These features include data collection from online learning platforms to gather relevant student information, data preprocessing to clean and prepare the collected data for analysis, and the application of machine learning algorithms to build predictive models. Additionally, the system will provide educators with insights into students' behaviors and learning patterns, enabling early identification of at-risk students and personalized interventions to support their academic success. Furthermore, the project may incorporate features such as model evaluation, scalability, and integration with existing learning management systems to enhance its effectiveness and usability in educational settings.

2.SYSTEM ANALYSIS

SYSTEM ANALYSIS

System Analysis is the important phase in the system development process.

The System is studied to the minute details and analyzed. The system analyst plays an important role of an interrogator and dwells deep into the working of the present system. In analysis, a detailed study of these operations performed by the system and their relationships within and outside the system is done. A key question considered here is, “what must be done to solve the problem?” The system is viewed as a whole and the inputs to the system are identified. Once analysis is completed the analyst has a firm understanding of what is to be done.

2.1 PROBLEM DEFINITION

The problem addressed by our project is the need for effective methods to predict students performance in online courses using machine learning algorithms. Online education has seen a rapid rise in popularity, but educators often struggle to identify students who may be at risk of falling behind or dropping out. By leveraging machine learning techniques, we aim to analyze various data points such as student demographics, academic history, and course interactions to develop predictive models. These models will help educators proactively identify at-risk students and provide timely interventions to support their learning journey, ultimately improving overall student outcomes in online education.

2.2 EXISTING SYSTEM

Educators often rely on traditional methods to assess student performance. These methods may include periodic exams, quizzes, and assignments. However, these assessments might not provide a comprehensive understanding of each students progress

.Educators may also use qualitative observations or feedback from students to guide their performance. While these approaches can be insightful, they are subjective and may not capture all relevant factors influencing student success in online courses.

Overall, the existing system lacks a systematic approach to predict student performance accurately. It relies heavily on manual assessment and may overlook early warning signs of struggling students. This can result in delayed interventions and decreased overall student engagement and success in online courses.

2.2.1 DISADVANTAGES OF EXISTING SYSTEM

Following are the disadvantages of existing system:

Data Quality Issues: The accuracy of predictions heavily relies on the quality and completeness of the data. Inaccurate or incomplete data can lead to biased predictions and reduced model performance.

Bias and Fairness Concerns: Machine learning models may inadvertently perpetuate or amplify biases present in the data, leading to unfair predictions, particularly concerning sensitive attributes such as race, gender, or socioeconomic status.

Lack of Interpretability: Many machine learning algorithms, such as deep learning models, are inherently complex and black-box in nature, making it challenging to interpret how they arrive at their predictions. This lack of interpretability can hinder educators' ability to understand and trust the model's recommendations.

Over fitting: If not properly addressed,machine learning models may over fit to the training data, capturing noise rather than meaningful patterns. This can result in poor generalization performance when applied to unseen data.

2.3 PROPOSED SYSTEM

In our proposed system, we aim to create a user-friendly and effective tool to support educators in understanding and assisting their students better. Firstly, we will gather various types of data from online learning platforms, such as student demographics, academic history, and their interactions within the course. This data will provide valuable insights into students behaviors and patterns, which can help predict their future performance. Next, we will process this data, making sure it's clean, organized, and ready for analysis. We look for important patterns and trends in the data that could indicate how well a student is likely to do in the course. Then, select the most appropriate machine learning algorithms to build our predictive models. These algorithms will learn from the patterns in the data to make predictions about how likely a student is to succeed or struggle in the course. Once our models are trained, we will evaluate their performance to ensure they are accurate and reliable. We will use metrics like accuracy, precision, and recall to measure how well our models are doing at predicting student performance.

Finally, we will deploy our models into the online learning platform or a separate application where educators can easily access and use them. They will be able to see predictions for individual students and use this information to provide targeted support and interventions where needed.

2.3.1 ADVANTAGES OF THE PROPOSED SYSTEM

- Personalized Support
- Efficient Resource Allocation
- Continuous Improvement
- Enhanced Student Engagement
- Scalability
- Data-Driven Decision-Making

2.4 FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and a business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. Three key considerations involved in the feasibility analysis:

- Economic Feasibility
- Technical Feasibility
- Social Feasibility

2.4.1 ECONOMIC FEASIBILITY

Economic Feasibility or Cost-benefit is an assessment of the economic justification for a computer based project. As hardware was installed from the beginning & for lots of purposes thus the cost on project of hardware is low. Since the system is a network based, any number of employees connected to the LAN within that organization can use this tool from at any time. The Virtual Private Network is to be developed using the existing resources of the organization. So the project is economically feasible.

2.4.2 TECHNICAL FEASIBILITY

According to Roger S. Pressman, Technical Feasibility is the assessment of the technical resources of the organization. The organization needs IBM compatible machines with a graphical web browser connected to the Internet and Intranet. The system is developed for platform Independent environment. Java Server Pages, JavaScript, HTML, SQL server and WebLogic Server are used to develop the system. The technical feasibility has been carried out. The system is technically feasible for development and can be developed with the existing facility.

2.4.3 SOCIAL FEASIBILITY

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

2.5 HARDWARE & SOFTWARE REQUIREMENTS:

2.5.1 HARDWARE REQUIREMENTS:

Hardware interfaces specify the logical characteristics of each interface between the software product and the hardware components of the system. The following are some hardware requirements.

- System : i3 processor.
- Hard Disk : 120 GB.
- Ram : 8 GB.

2.5.2 SOFTWARE REQUIREMENTS:

Software Requirements specifies the logical characteristics of each interface and software components of the system. The following are some software requirements.

- Operating System : Windows 10.
- Data Base : MySQL
- Designing : Html ,CSS ,Java script
- Coding Language : python

3.ARCHITECTURE

PROJECT ARCHITECTURE

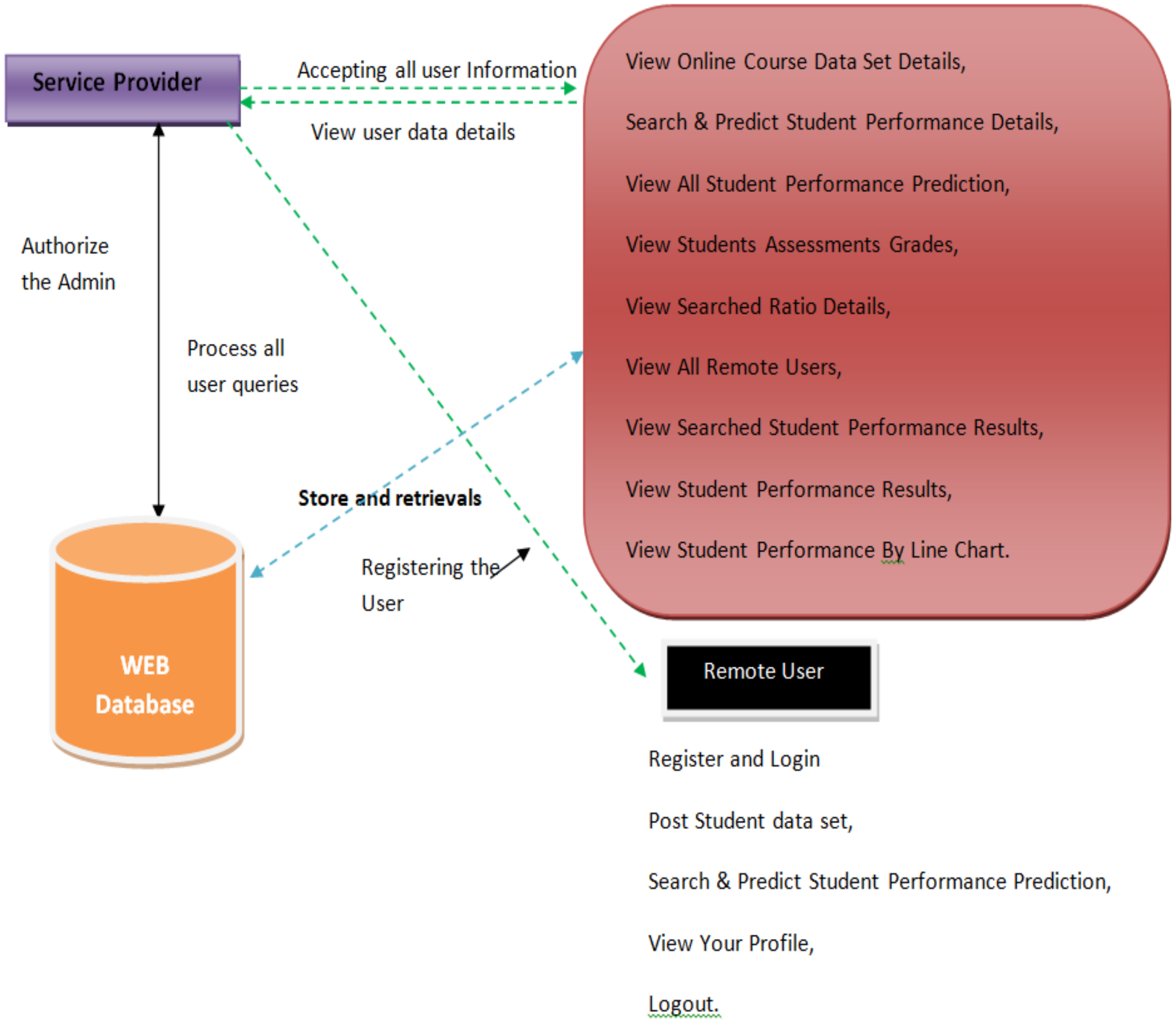

Service Provider
Accepting all user Information
View user data details
Authorize the Admin
Process all user queries
Store and retrievals
Registering the User
WEB Database
View Online Course Data Set Details,
Search & Predict Student Performance Details,
View All Student Performance Prediction,
View Students Assessments Grades,
View Searched Ratio Details,
View All Remote Users,
View Searched Student Performance Results,
View Student Performance Results,
View Student Performance By Line Chart.
Remote User
Register and Login
Post Student data set,
Search & Predict Student Performance Prediction,
View Your Profile,
Logout.

Figure 3.1: Project Architecture of Students Performance Prediction in Online Courses Using Machine Learning Algorithms

3.1 DESCRIPTION

By analyzing various data points such as demographics, academic history, and course interactions, we aim to develop accurate predictive models. These models will help educators identify at-risk students early, allowing for targeted interventions and support strategies to improve overall student outcomes. Through this project, we aim to enhance the effectiveness of online education and foster a more personalized learning experience for students.

3.2 USE CASE DIAGRAM

In the use case diagram, we have basically one actor who is the user in the trained model. A use case diagram is a graphical depiction of a user's possible interactions with a system. A use case diagram shows various use cases and different types of users the system has. The use cases are represented by either circles or ellipses. The actors are often shown as stick figures.

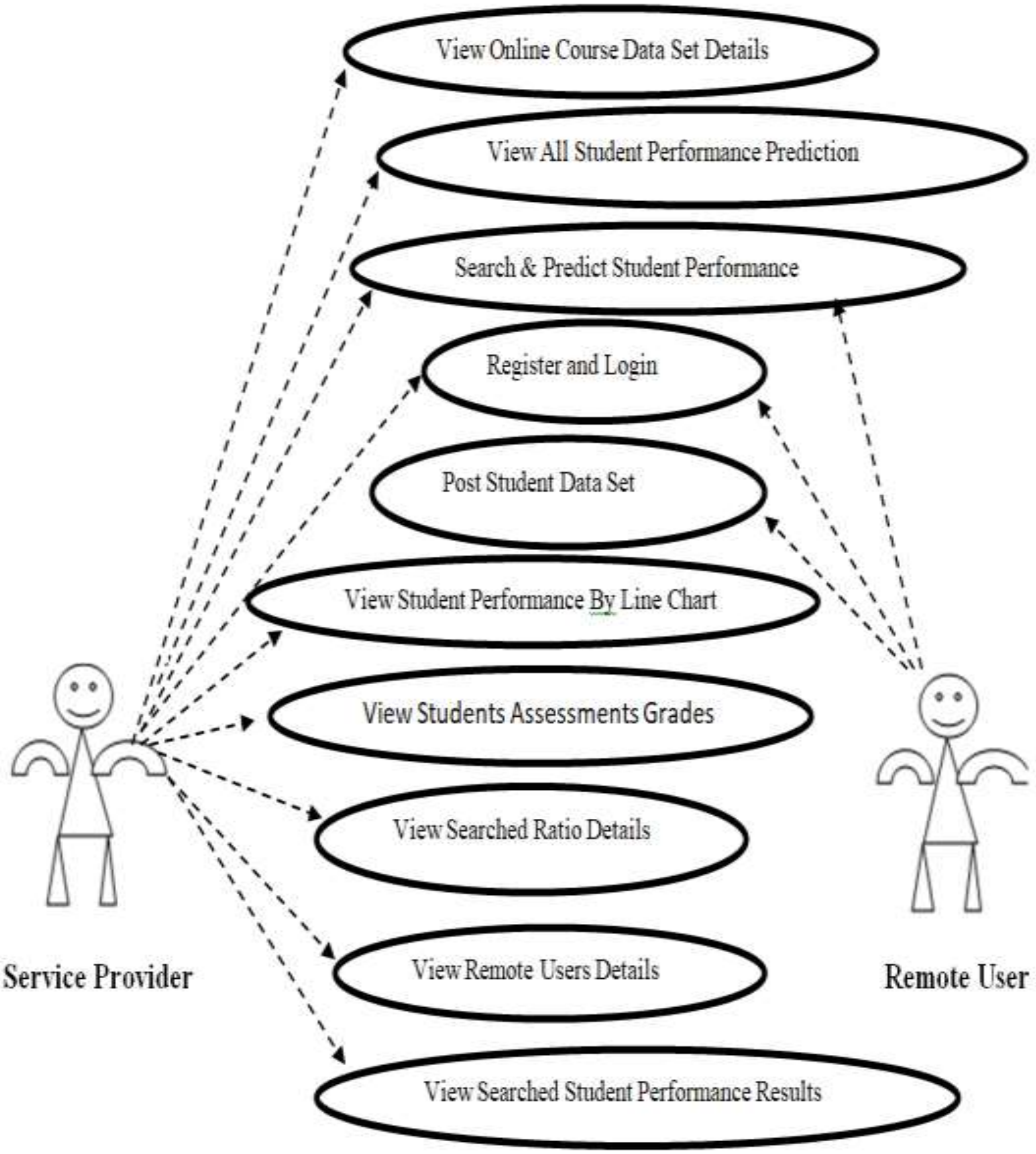

View Online Course Data Set Details
View All Student Performance Prediction
Search & Predict Student Performance
Register and Login
Post Student Data Set
View Student Performance By Line Chart
View Students Assessments Grades
View Searched Ratio Details
View Remote Users Details
View Searched Student Performance Results
Service Provider
Remote User

Figure 3.2: Use Case Diagram of Students Performance Prediction in Online Courses Using Machine Learning Algorithms

3.3 CLASS DIAGRAM

Class diagram is a type of static structure diagram that describes the structure of a system by showing the system’s classes, their attributes, operations (or methods), and the relationships among objects

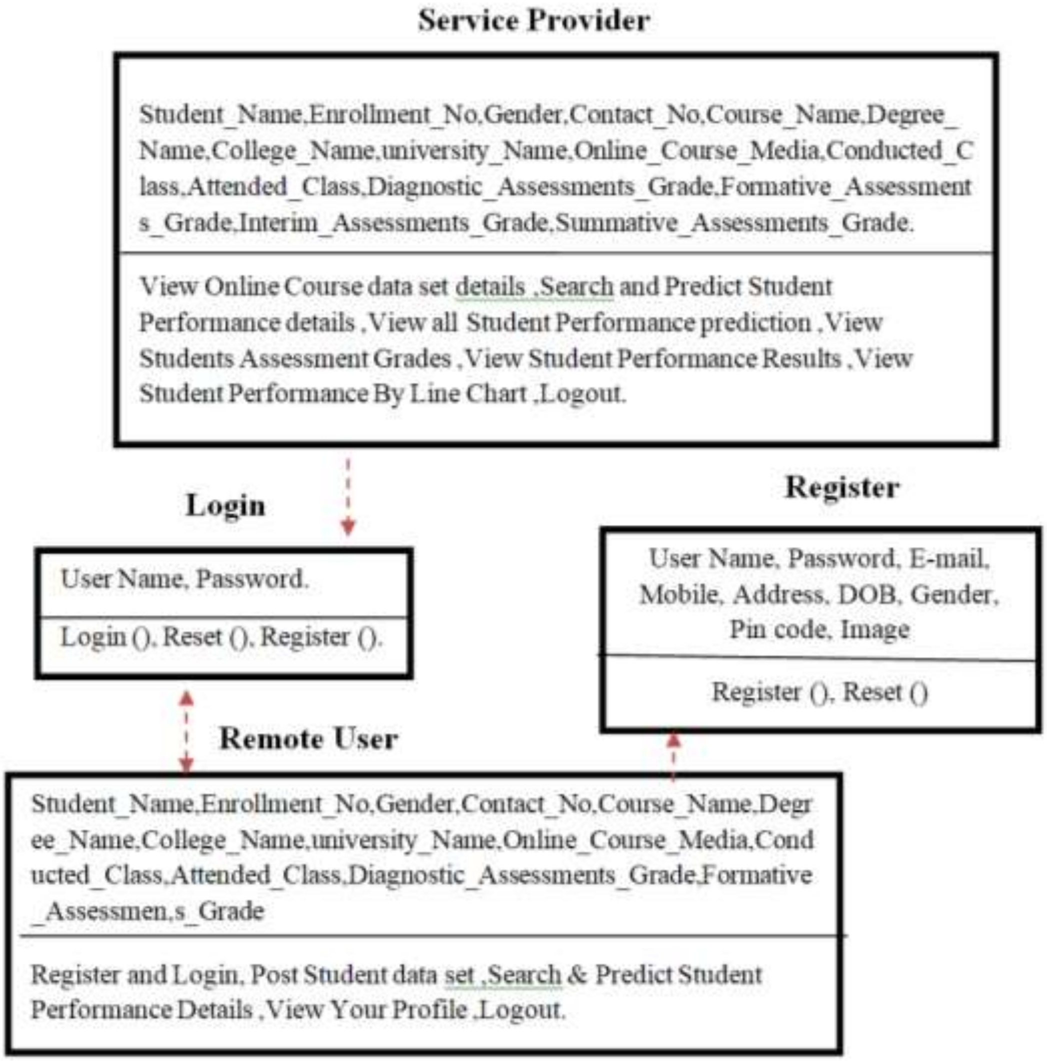

Service Provider
Student_Name,Enrollment_No,Gender,Contact_No,Course_Name,Degree_Name,College_Name,university_Name,Online_Course_Media,Conducted_Class,Attended_Class,Diagnostic_Assessments_Grade,Formative_Assessments_Grade,Interim_Assessments_Grade,Summative_Assessments_Grade.
View Online Course data set details ,Search and Predict Student Performance details ,View all Student Performance prediction ,View Students Assessment Grades ,View Student Performance Results ,View Student Performance By Line Chart ,Logout.
Login
User Name, Password.
Login (), Reset (), Register ().
Register
User Name, Password, E-mail, Mobile, Address, DOB, Gender, Pin code, Image
Register (), Reset ()
Remote User
Student_Name,Enrollment_No,Gender,Contact_No,Course_Name,Degree_Name,College_Name,university_Name,Online_Course_Media,Conducted_Class,Attended_Class,Diagnostic_Assessments_Grade,Formative_Assessmen,s_Grade
Register and Login, Post Student data set ,Search & Predict Student Performance Details ,View Your Profile ,Logout.

Figure 3.3: Class Diagram for Students Performance Prediction in Online Courses Using Machine Learning Algorithms

3.4 SEQUENCE DIAGRAM

A sequence diagram shows object interactions arranged in time sequence. It depicts the objects involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario.

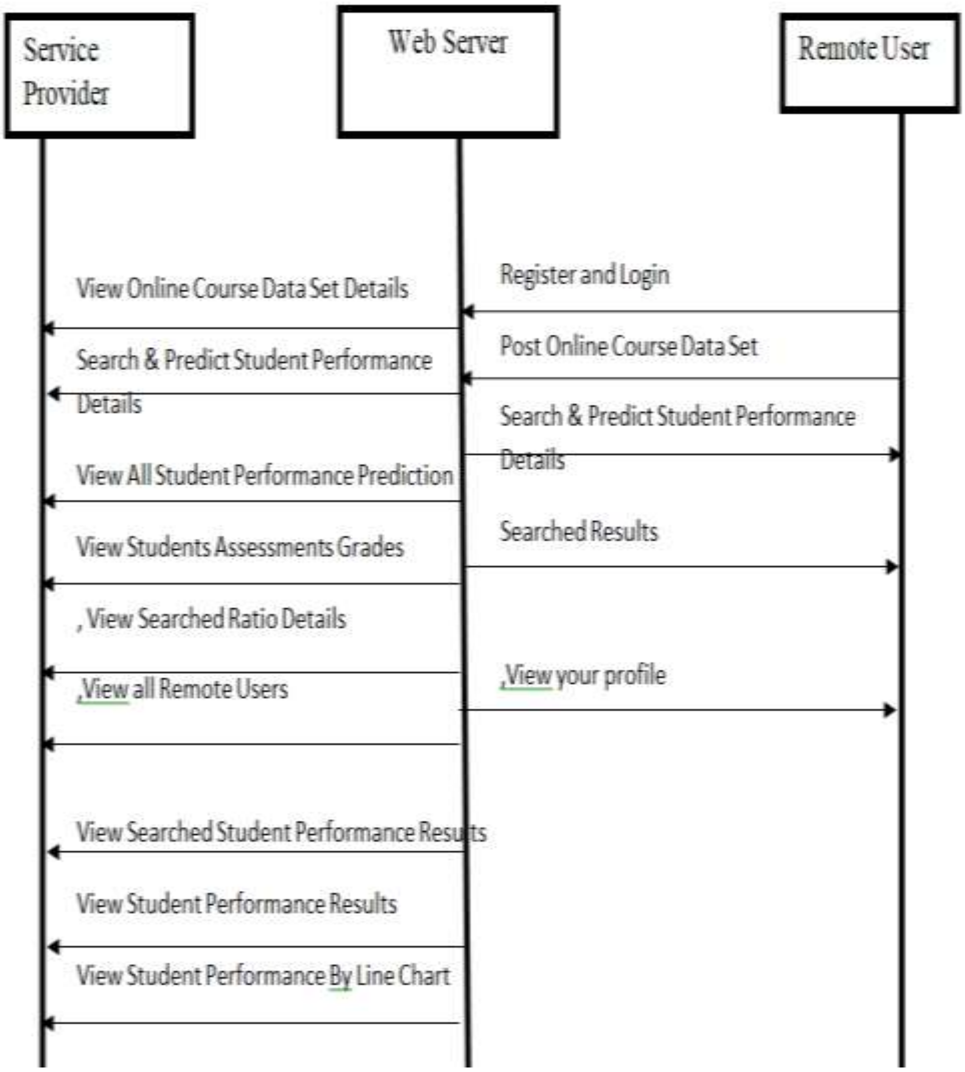

Service Provider
Web Server
Remote User
View Online Course Data Set Details
Register and Login
Post Online Course Data Set
Search & Predict Student Performance Details
Search & Predict Student Performance Details
View All Student Performance Prediction
View Students Assessments Grades
Searched Results
, View Searched Ratio Details
,View all Remote Users
,View your profile
View Searched Student Performance Results
View Student Performance Results
View Student Performance By Line Chart

Figure 3.4: Sequence Diagram for Students Performance Prediction in Online Courses Using Machine Learning Algorithms

3.5 ACTIVITY DIAGRAM

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. They can also include elements showing the flow of data between activities through one or more datastores.

- **Flow Chart : Service Provider**

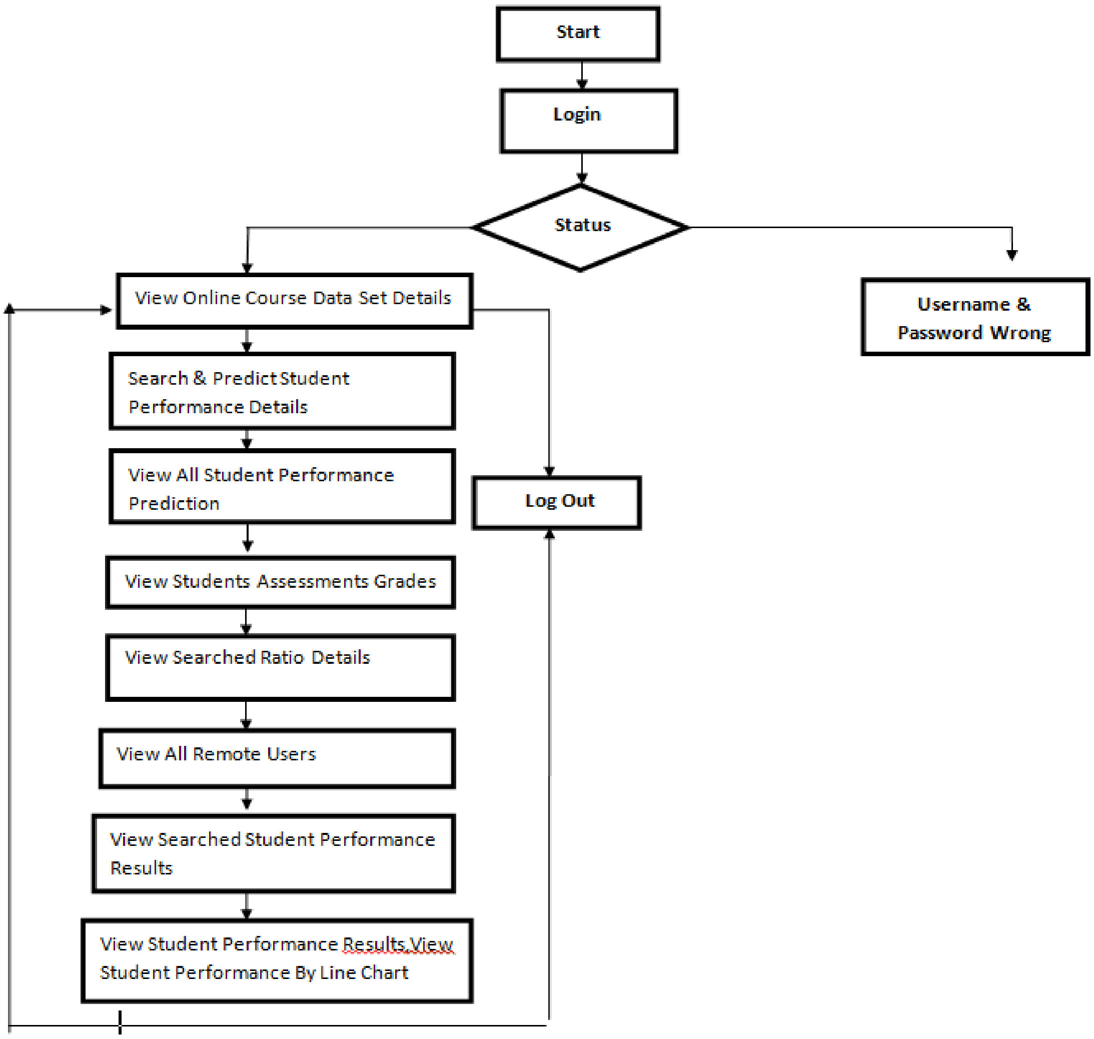

Start
Login
Status
View Online Course Data Set Details
Username & Password Wrong
Search & Predict Student Performance Details
View All Student Performance Prediction
Log Out
View Students Assessments Grades
View Searched Ratio Details
View All Remote Users
View Searched Student Performance Results
View Student Performance Results,View Student Performance By Line Chart

Figure 3.5: Activity Diagram for Students Performance Prediction in Online Courses Using Machine Learning Algorithms

4.SAMPLE CODE

SERVICE PROVIDER

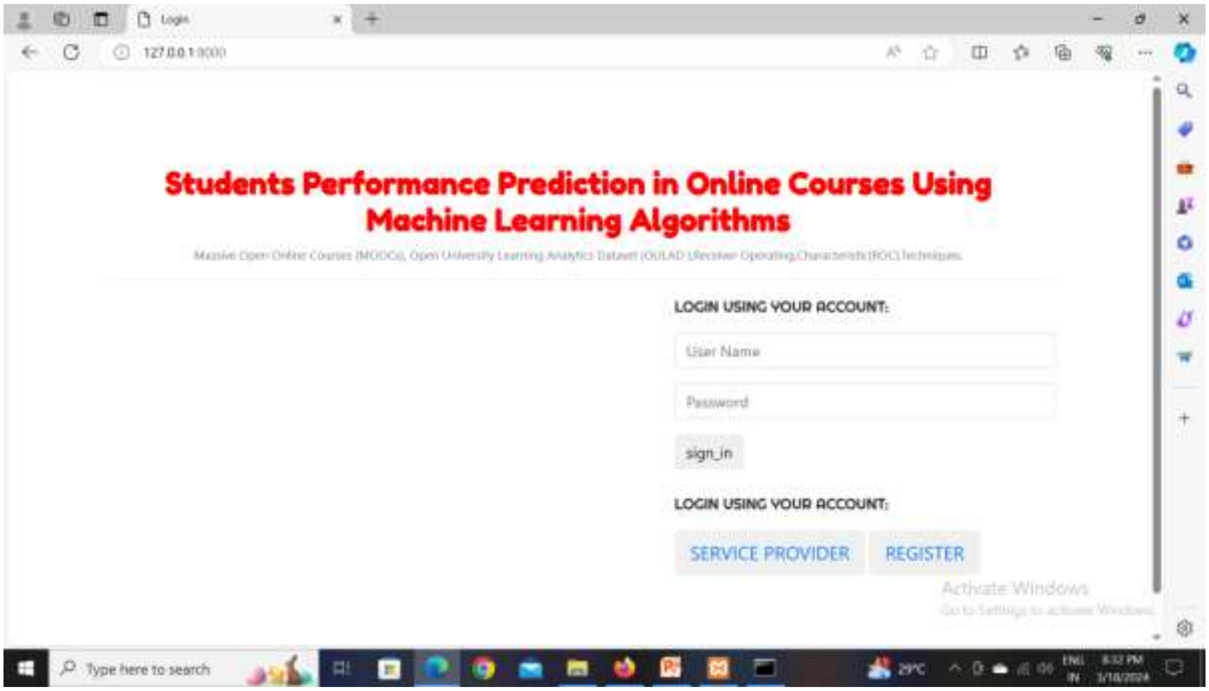
```
from django.db.models import  Count, Avg
from django.shortcuts import render, redirect
from django.db.models import Count
from django.db.models import Q
import datetime
# Create your views here.
from Remote_User.models import
ClientRegister_Model,review_Model,student_performance_model,
recommend_Model,performance_ratio_model,search_ratio_model
def serviceproviderlogin(request):
    if request.method  == "POST":
        admin = request.POST.get('username')
        password = request.POST.get('password')
        if admin == "SProvider" and password =="SProvider":
            performance_ratio_model.objects.all().delete()
            search_ratio_model.objects.all().delete()
            return redirect('View_Remote_Users')
        return render(request,'SProvider/serviceproviderlogin.html')
def viewtreandingquestions(request,chart_type):
    dd = {}
    pos,neu,neg =0,0,0
    poss=None
    topic = student_performance_model.objects.values('ratings').annotate
   (dcount=Count('ratings')).order_by('-dcount')
    for t in topic:
        topics=t['ratings']
        pos_count=student_performance_model.objects.filter(topics=topics).
        values('names').annotate(topiccount=Count('ratings'))
        poss=pos_count
        for pp in pos_count:
            senti= pp['names']
        if senti == 'positive':
                pos= pp['topiccount']
            elif senti == 'negative':
                neg = pp['topiccount']
            elif senti == 'nutral':
                neu = pp['topiccount']

    if request.method == "POST":
        kword = request.POST.get('keyword')
        print(kword)
        obj = student_performance_model.objects.all().filter(Q(Enrollment_No_
         _contains=kword) | Q(names__contains=kword))
        obj1 = student_performance_model.objects.get(Q(Enrollment_No
      __contains=kword) | Q(names__contains=kword))
        Diagnostic_Assessments_Grade = obj1.Diagnostic_Assessments_Grade
        Formative_Assessments_Grade = obj1.Formative_Assessments_Grade
        Interim_Assessments_Grade=obj1.Interim_Assessments_Grade
        Summative_Assessments_Grade=obj1.Summative_Assessments_Grade

        grade =      ((Diagnostic_Assessments_Grade+Formative_Assessments_Grade+
           Interim_Assessments_Grade+Summative_Assessments_Grade)/28)*100

        if grade != 0:
            search_ratio_model.objects.create(names=kword, ratio=grade)
        return render(request, 'SProvider/Search_Student_Performance.html', {'objs': obj,'ratio':
grade})
   return render(request, 'SProvider/Search_Student_Performance.html')

def View_All_StudentPerformance_Prediction_Details(request):
    sname = ''
    Eno = ''
    gender = ''
    cname = ''
    dname = ''
   collegename =''
    obj1 = student_performance_model.objects.values('names',
                                                    'Enrollment_No',
                                                    'Gender',
                                                    'Course_Name',
                                                    'Degree_Name',
                                                    'College_Name',
                                                    'Diagnostic_Assessments_Grade',
                                                    'Formative_Assessments_Grade',
                                                    'Interim_Assessments_Grade',
                                                    'Summative_Assessments_Grade'
                                                    )

    performance_ratio_model.objects.all().delete()
    for t in obj1:
       sname = t['names']
        Eno = t['Enrollment_No']
        gender = t['Gender']
        cname = t['Course_Name']
        dname = t['Degree_Name']
        collegename = t['College_Name']
        Diagnostic_Assessments_Grade = t['Diagnostic_Assessments_Grade']
        Formative_Assessments_Grade = t['Formative_Assessments_Grade']
        Interim_Assessments_Grade = t['Interim_Assessments_Grade']
        Summative_Assessments_Grade = t['Summative_Assessments_Grade']
        performance = ((Diagnostic_Assessments_Grade + Formative_Assessments_Grade +
Interim_Assessments_Grade + Summative_Assessments_Grade) / 28) * 100

performance_ratio_model.objects.create(names=sname,ENo=Eno,Gender=gender,Course_Na
me=cname,Degree_Name=dname,College_Name=collegename,perfromance=performance)
```

```
    return
render(request,'SProvider/negativechart.html',{'object':topic,'dd':dd,'chart_type':chart_type})



def charts(request,chart_type):
    chart1 = search_ratio_model.objects.values('names').annotate(dcount=Avg('ratio'))
    return render(request,"SProvider/charts.html", {'form':chart1, 'chart_type':chart_type})

def charts1(request,chart_type):
    chart1 = performance_ratio_model.objects.values('names').annotate(dcount=
Avg('perfromance'))
    return render(request,"SProvider/charts1.html", {'form':chart1, 'chart_type':chart_type})

def View_Student_Performance_Details(request):
    obj =student_performance_model.objects.all()
    return render(request, 'SProvider/View_Student_Performance_Details.html',
{'list_objects': obj})

def likeschart(request,like_chart):
    charts =performance_ratio_model.objects.values('names').annotate
(dcount=Avg('perfromance'))
    return render(request,"SProvider/likeschart.html", {'form':charts, 'like_chart':like_chart})

def View_Students_Assessments_Grades(request):
    obj = student_performance_model.objects.all()
    return render(request, 'SProvider/View_Students_Assessments_Grades.html',
{'list_objects': obj})

def View_Search_Ratio(request):
    obj = search_ratio_model.objects.all()
    return render(request, 'SProvider/View_Search_Ratio.html', {'list_objects': obj})
```

REMOTE USER

```
from django.db.models import Count
from django.db.models import Q
from django.shortcuts import render, redirect, get_object_or_404
import datetime
import openpyxl
# Create your views here.
from Remote_User.models import
review_Model,ClientRegister_Model,student_performance_model,performance,
recommend_Model,search_ratio_model,student_performance_model
def login(request):
       if request.method == "POST" and 'submit1' in request.POST:
        username = request.POST.get('username')
        password = request.POST.get('password')
        try:
            enter = ClientRegister_Model.objects.get(username=username, password=password)
            request.session["userid"] = enter.id
            performance_ratio_model.objects.all().delete()
            search_ratio_model.objects.all().delete()
            return redirect('Add_DataSet_Details')
        except:
            pass
    return render(request,'RUser/login.html')

def Add_DataSet_Details(request):
    if "GET" == request.method:
        return render(request, 'RUser/Add_DataSet_Details.html', {})
    else:
        excel_file = request.FILES["excel_file"]
        wb = openpyxl.load_workbook(excel_file)
        sheets = wb.sheetnames
        print(sheets)
    worksheet = wb["Sheet1"]
       print(worksheet)
        active_sheet = wb.active
        print(active_sheet)
        print(worksheet["A1"].value)
        excel_data = list()
        for row in worksheet.iter_rows():
            row_data = list()
            for cell in row:
                row_data.append(str(cell.value))
                print(cell.value)
            excel_data.append(row_data)
 def Register1(request):
    if request.method == "POST":
        username = request.POST.get('username',
        email = request.POST.get('email')
        password = request.POST.get('password')
        phoneno = request.POST.get('phoneno')
        country = request.POST.get('country')
        state = request.POST.get('state')
        city = request.POST.get('city')
        ClientRegister_Model.objects.create(username=username, email=email,
password=password, phoneno=phoneno,
               country=country, state=state, city=city)
        return render(request, 'RUser/Register1.html')
    else:
        return render(request,'RUser/Register1.html')

def ViewYourProfile(request):
    userid = request.session['userid']
    obj = ClientRegister_Model.objects.get(id= userid)
    return render(request,'RUser/ViewYourProfile.html',{'object':obj})

def Search_StudentPerformance_DataSets(request):
    if request.method == "POST":
        kword = request.POST.get('keyword'
        print(kword)
        obj = student_performance_model.objects.all().filter(
            Q(Enrollment_No__contains=kword) | Q(names__contains=kword))
        obj1 = student_performance_model.objects.get(Q(Enrollment_No__contains=kword) |
Q(names__contains=kword))
        Diagnostic_Assessments_Grade = obj1.Diagnostic_Assessments_Grade
        Formative_Assessments_Grade = obj1.Formative_Assessments_Grade
        Interim_Assessments_Grade = obj1.Interim_Assessments_Grade
        Summative_Assessments_Grade = obj1.Summative_Assessments_Grade



    grade = ((Diagnostic_Assessments_Grade + Formative_Assessments_Grade +
Interim_Assessments_Grade + Summative_Assessments_Grade) / 28) * 100

        return render(request, 'RUser/Search_StudentPerformance_DataSets.html',{'objs':
obj,'ratio':grade})
    return render(request, 'RUser/Search_StudentPerformance_DataSets.html')

def ratings(request,pk):
    vott1, vott, neg = 0, 0, 0
    objs = student_performance_model.objects.get(id=pk)
    unid = objs.id
    vot_count = student_performance_model.objects.all().filter(id=unid)

  for t in vot_count:
        vott = t.ratings
        vott1 = vott + 1
        obj = get_object_or_404(student_performance_model, id=unid)
        obj.ratings = vott1
        obj.save(update_fields=["ratings"])
        return redirect('Add_DataSet_Details')

    return render(request,'RUser/ratings.html',{'objs':vott1})
```

5.RESULT



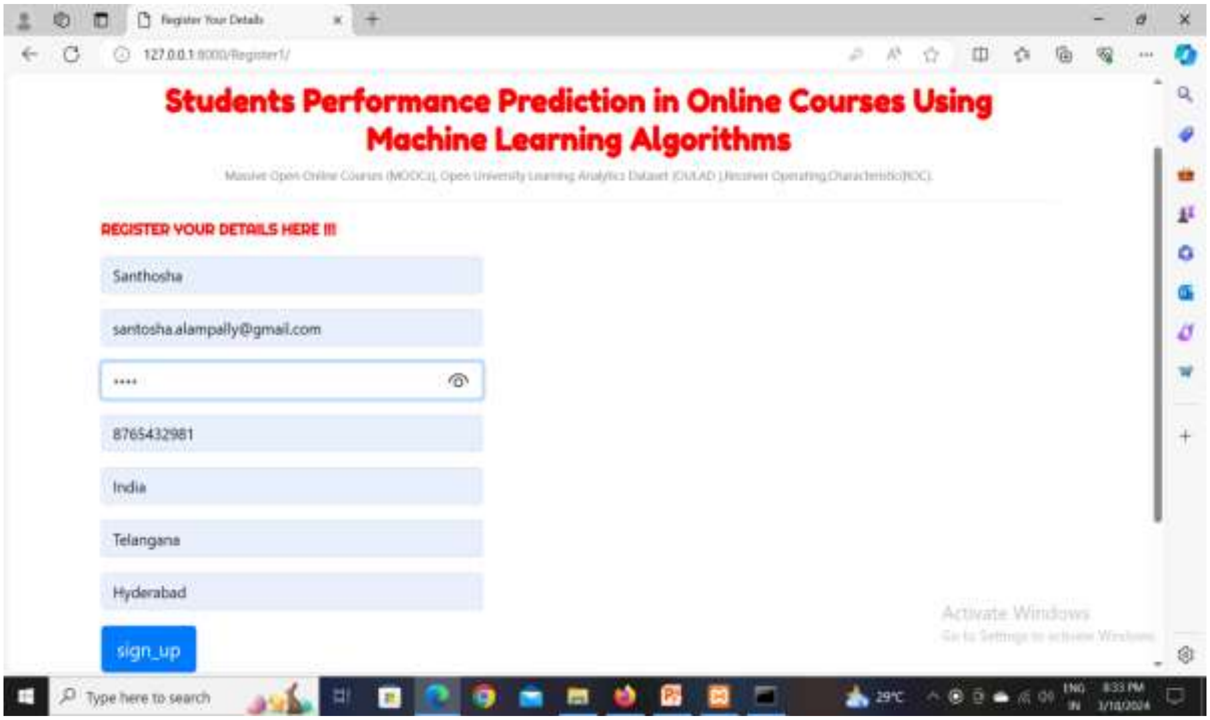
Students Performance Prediction in Online Courses Using Machine Learning Algorithms

Massive Open Online Courses (MOOCs), Open University Learning Analytics Dataset (OULAD),Receiver Operating,Characteristic(ROC) Techniques

LOGIN USING YOUR ACCOUNT:

LOGIN USING YOUR ACCOUNT:

Screenshot 5.1:Project Home Page



Students Performance Prediction in Online Courses Using Machine Learning Algorithms

Massive Open Online Courses (MOOCs), Open University Learning Analytics Dataset (OULAD),Receiver Operating,Characteristic(ROC).

REGISTER YOUR DETAILS HERE !!!

Santhosha

santosha.alampally@gmail.com

••••

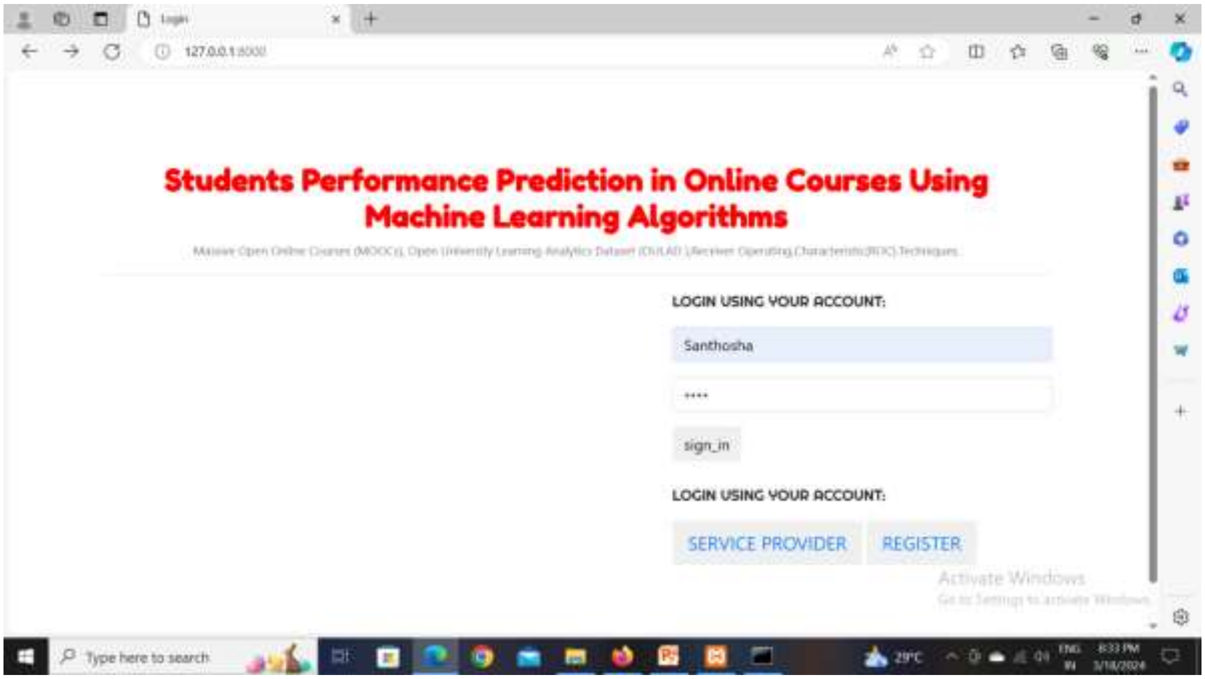
8765432981

India

Telangana

Hyderabad

Screenshot 5.2: Remote User Registration



Students Performance Prediction in Online Courses Using Machine Learning Algorithms

Massive Open Online Courses (MOOCs), Open University Learning Analytics Dataset (OULAD),Reciever Operating Characteristic(ROC) Techniques.

LOGIN USING YOUR ACCOUNT:

Santhosha

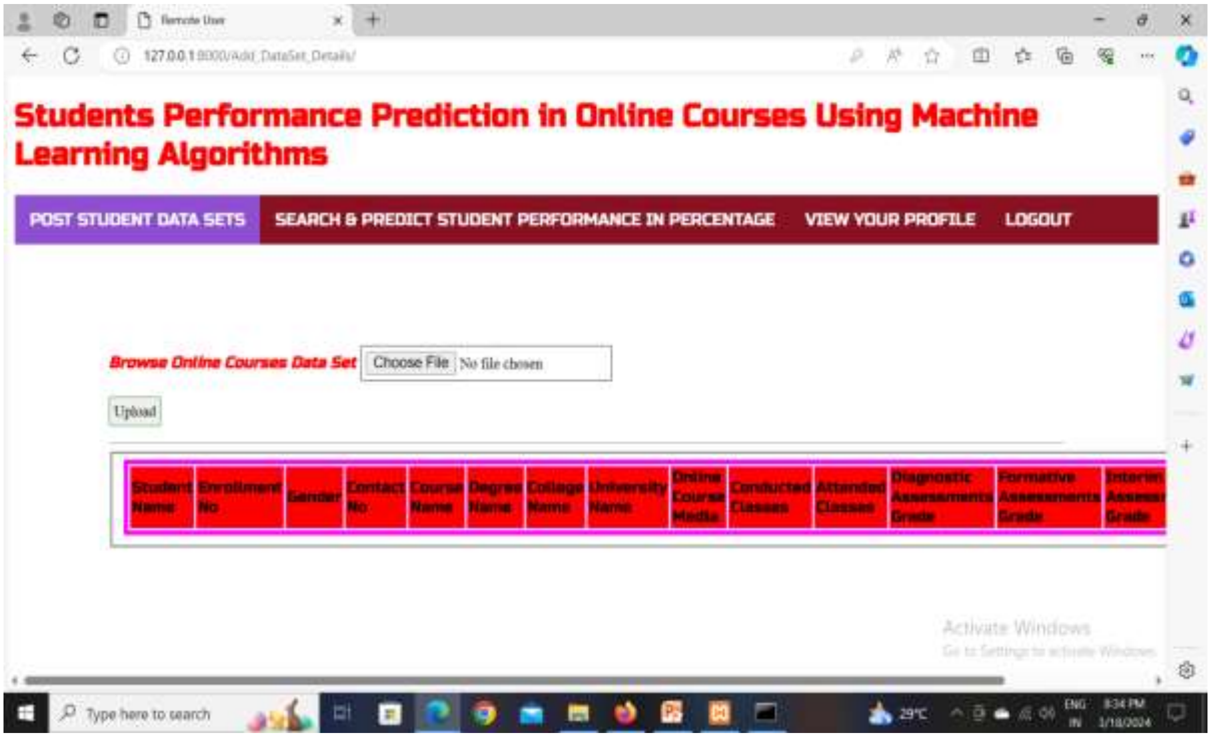
••••

sign_in

LOGIN USING YOUR ACCOUNT:

SERVICE PROVIDER REGISTER

Screenshot 5.3: Remote User Login



Students Performance Prediction in Online Courses Using Machine Learning Algorithms

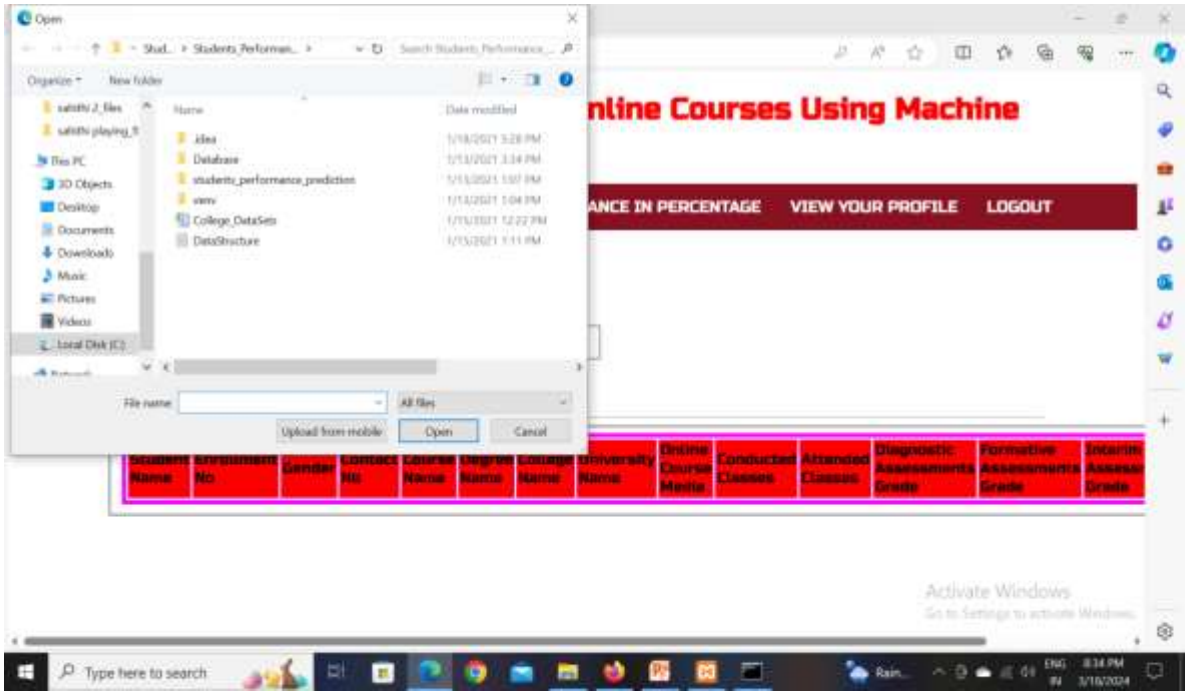
POST STUDENT DATA SETS SEARCH & PREDICT STUDENT PERFORMANCE IN PERCENTAGE VIEW YOUR PROFILE LOGOUT

Browse Online Courses Data Set Choose File No file chosen

Upload

Student Name	Enrollment No	Gender	Contact No	Course Name	Degree Name	Collage Name	University Name	Online Course Media	Conducted Classes	Attended Classes	Diagnostic Assessments Grade	Formative Assessments Grade	Interim Assessm Grade

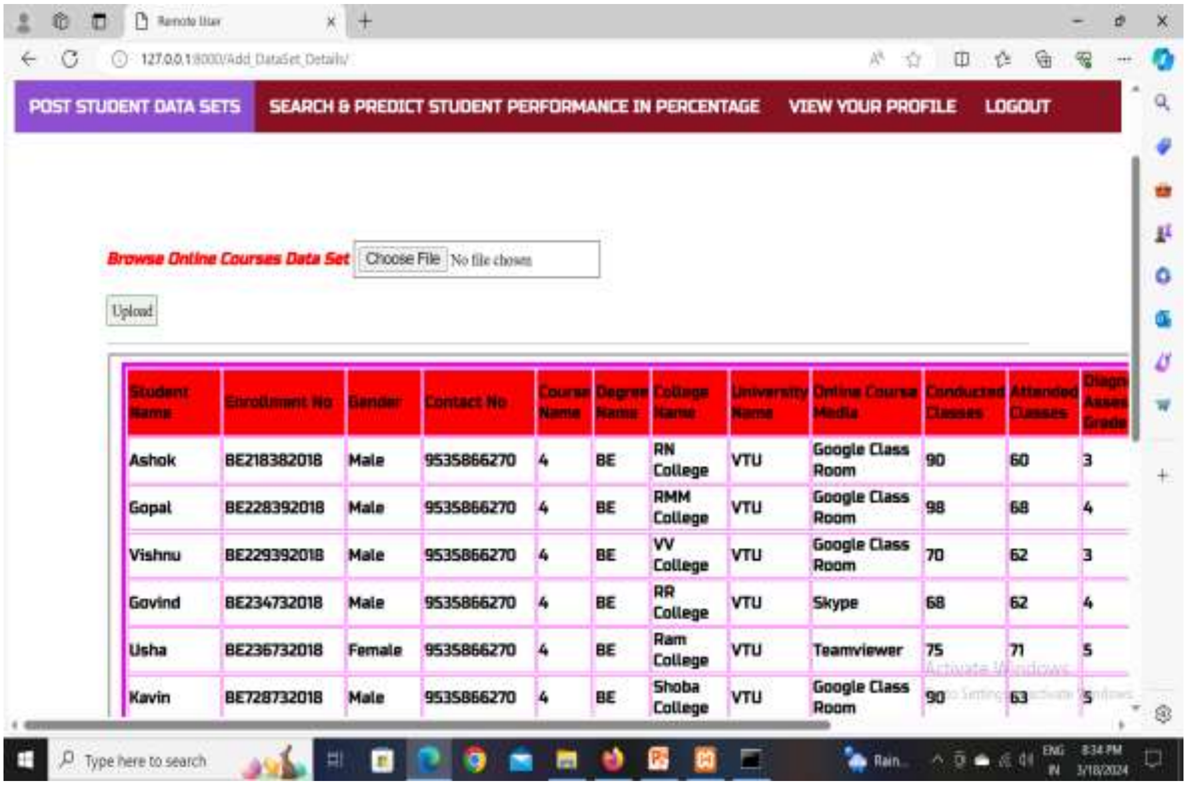
Screenshot 5.4 : Post Student Data Set



Name	Date modified
.idea	1/18/2021 3:28 PM
Database	1/13/2021 3:34 PM
students_performance_prediction	1/13/2021 1:07 PM
venv	1/13/2021 1:04 PM
College_DataSets	1/15/2021 12:22 PM
DataStructure	1/15/2021 1:11 PM

Student Name	Enrollment No	Gender	Contact No	Course Name	Degree Name	College Name	University Name	Online Course Media	Conducted Classes	Attended Classes	Diagnostic Assessments Grade	Formative Assessments Grade	Interim Assessm Grade

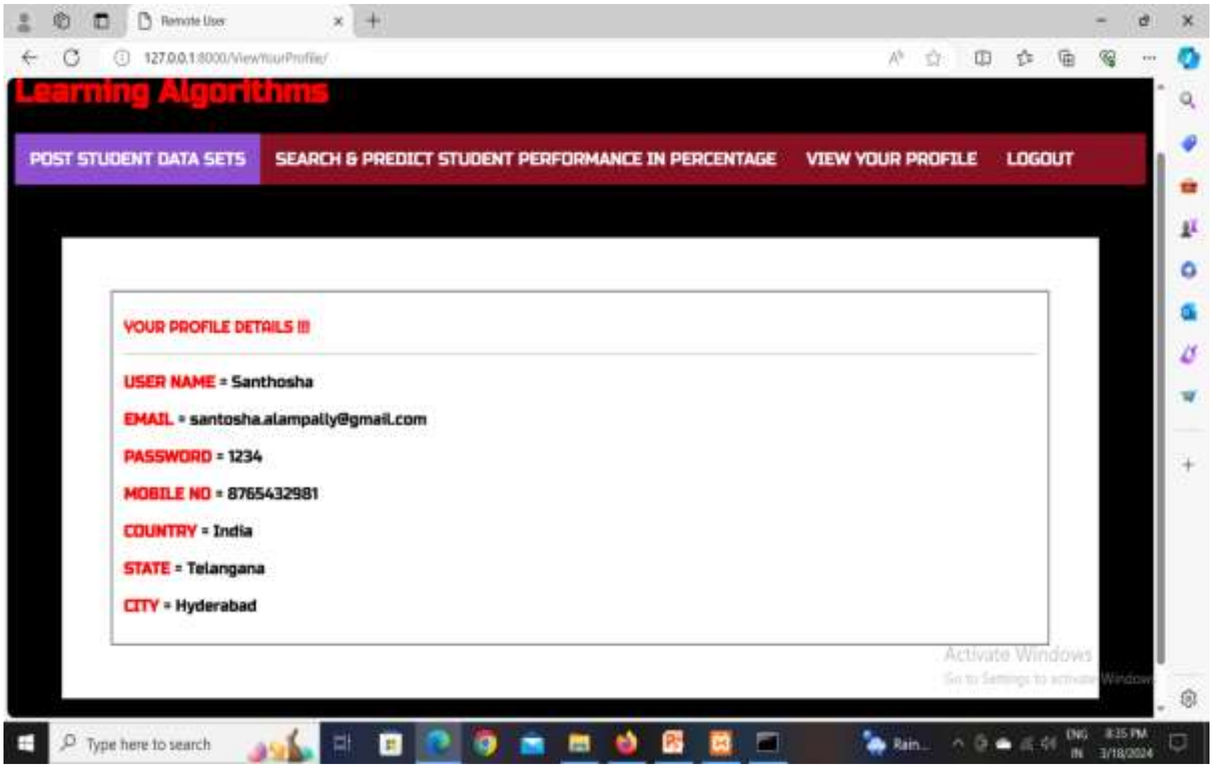
Screenshot 5.5: Upload the Data Set



Browse Online Courses Data Set No file chosen

Student Name	Enrollment No	Gender	Contact No	Course Name	Degree Name	College Name	University Name	Online Course Media	Conducted Classes	Attended Classes	Diagn Asses Grade
Ashok	BE218382018	Male	9535866270	4	BE	RN College	VTU	Google Class Room	90	60	3
Gopal	BE228392018	Male	9535866270	4	BE	RMM College	VTU	Google Class Room	98	68	4
Vishnu	BE229392018	Male	9535866270	4	BE	VV College	VTU	Google Class Room	70	62	3
Govind	BE234732018	Male	9535866270	4	BE	RR College	VTU	Skype	68	62	4
Usha	BE236732018	Female	9535866270	4	BE	Ram College	VTU	Teamviewer	75	71	5
Kavin	BE728732018	Male	9535866270	4	BE	Shoba College	VTU	Google Class Room	90	63	5

Screenshot 5.6: Search and Predict Student Performance in Percentage



YOUR PROFILE DETAILS !!!

USER NAME = Santhosha

EMAIL = santosha.alampally@gmail.com

PASSWORD = 1234

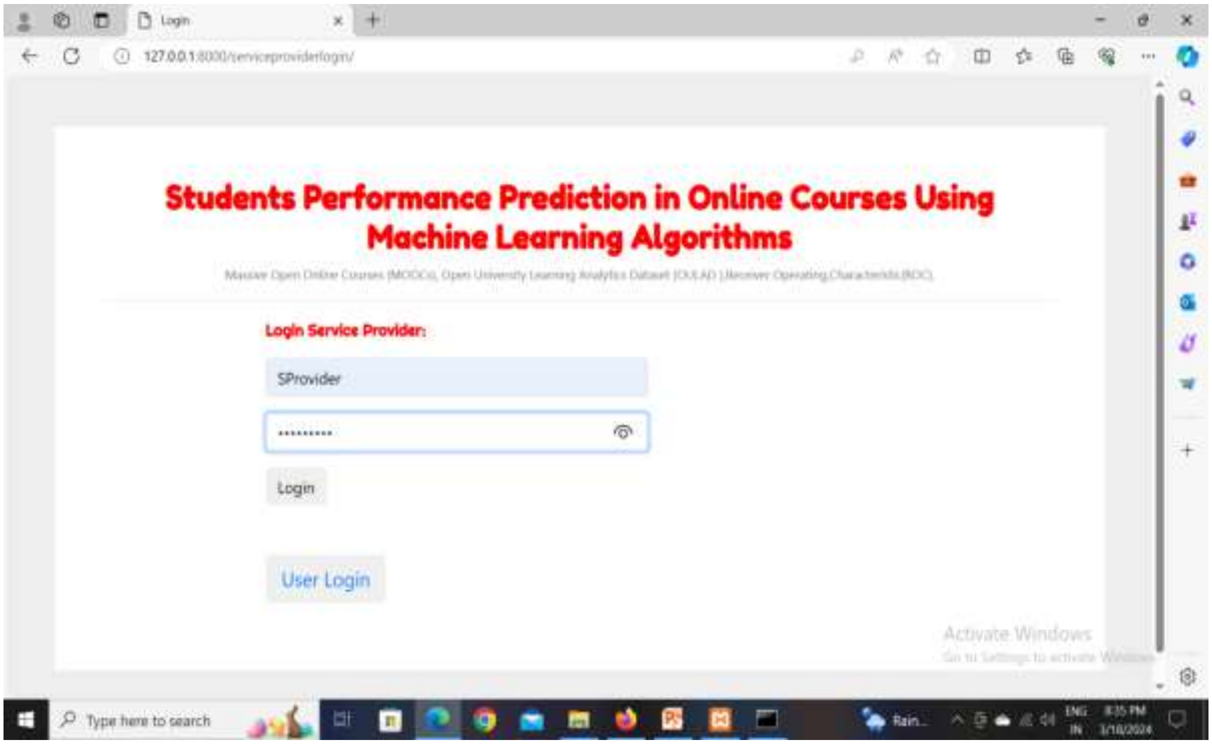
MOBILE NO = 8765432981

COUNTRY = India

STATE = Telangana

CITY = Hyderabad

Screenshot 5.7: Remote User Profile



Students Performance Prediction in Online Courses Using Machine Learning Algorithms

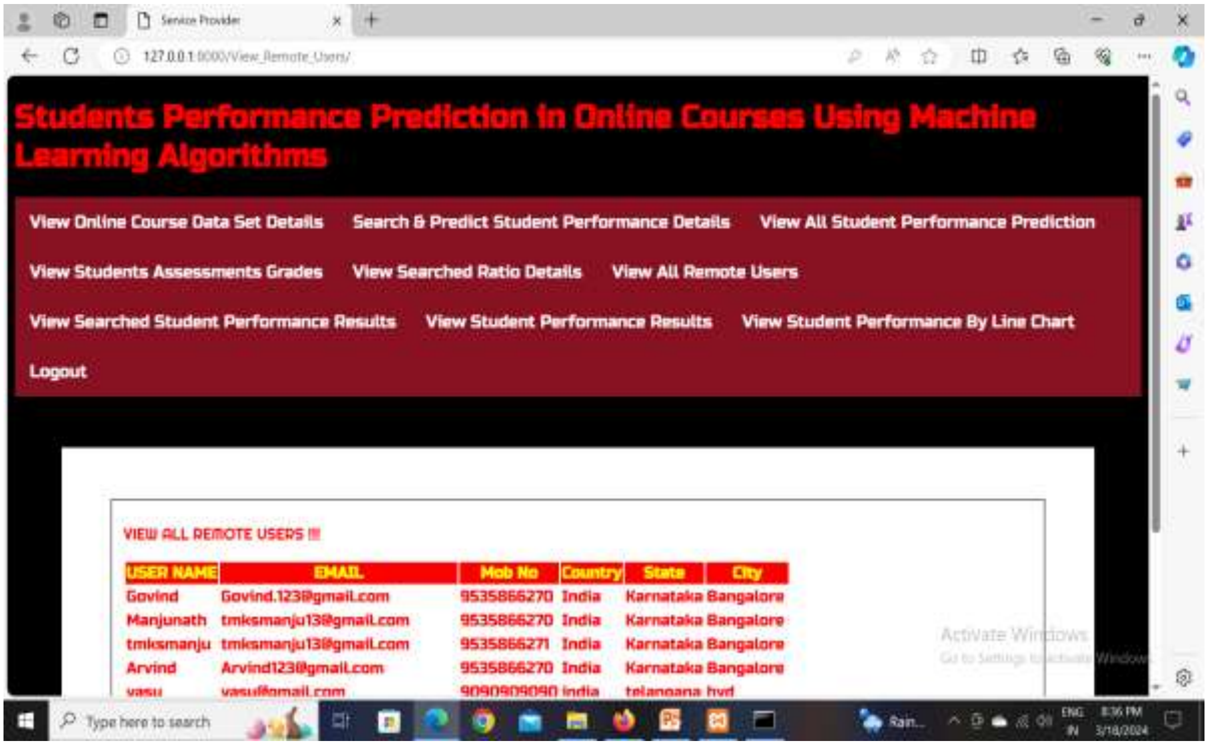
Massive Open Online Courses (MOOCs), Open University Learning Analytics Dataset (OULAD),Receiver Operating Characteristic(ROC)

Login Service Provider:

SProvider

••••••••••

Screenshot 5.8: Service Provider Login

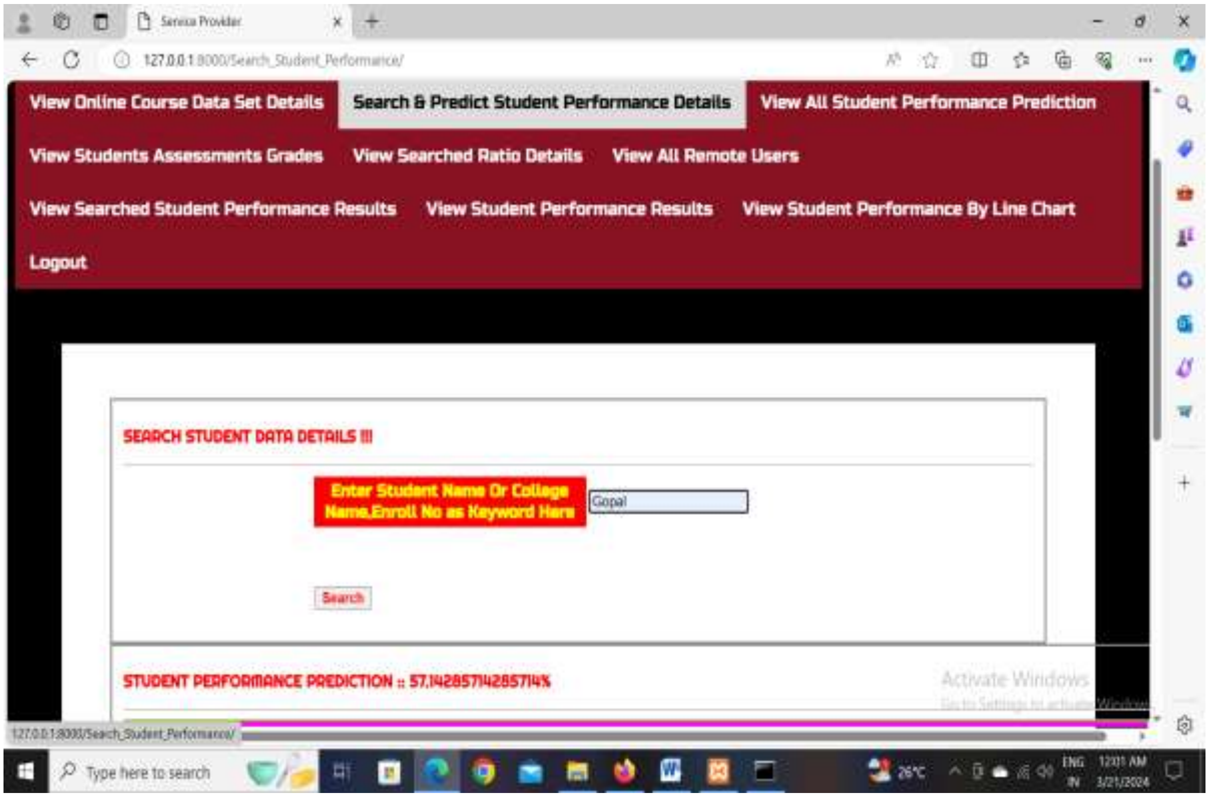

Service Provider
127.0.0.1:8000/View_Remote_Users/
View Online Course Data Set Details
Search & Predict Student Performance Details
View All Student Performance Prediction
View Students Assessments Grades
View Searched Ratio Details
View All Remote Users
View Searched Student Performance Results
View Student Performance Results
View Student Performance By Line Chart
Logout
Type here to search

Students Performance Prediction in Online Courses Using Machine Learning Algorithms

VIEW ALL REMOTE USERS !!!

USER NAME	EMAIL	Mob No	Country	State	City
Govind	Govind.123@gmail.com	9535866270	India	Karnataka	Bangalore
Manjunath	tmksmanju13@gmail.com	9535866270	India	Karnataka	Bangalore
tmksmanju	tmksmanju13@gmail.com	9535866271	India	Karnataka	Bangalore
Arvind	Arvind123@gmail.com	9535866270	India	Karnataka	Bangalore
vasu	vasu@gmail.com	9090909090	india	telangana	hyd

Screenshot 5.9: Service Provider View Online Course Data set Details

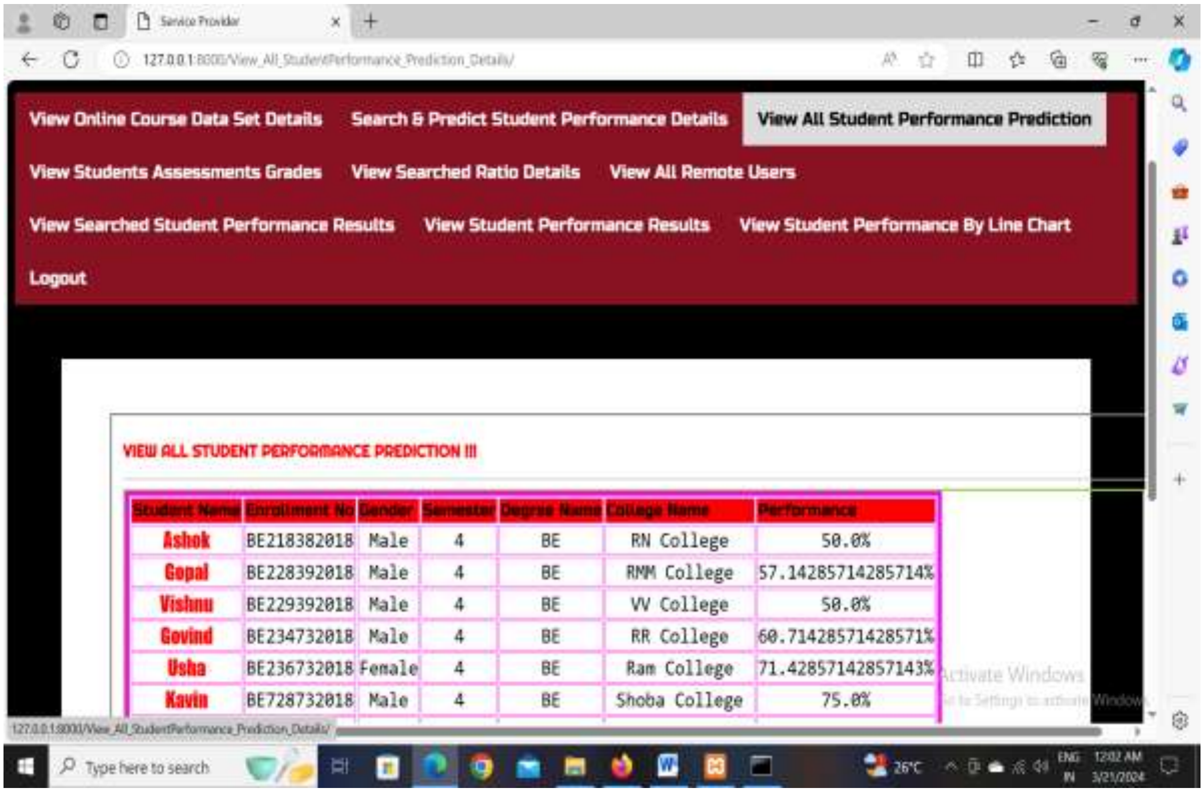

Service Provider
127.0.0.1:8000/Search_Student_Performance/
View Online Course Data Set Details
Search & Predict Student Performance Details
View All Student Performance Prediction
View Students Assessments Grades
View Searched Ratio Details
View All Remote Users
View Searched Student Performance Results
View Student Performance Results
View Student Performance By Line Chart
Logout
Search
Type here to search

SEARCH STUDENT DATA DETAILS !!!

Enter Student Name Or College Name,Enroll No as Keyword Here: Gopal

STUDENT PERFORMANCE PREDICTION :: 57.14285714285714%

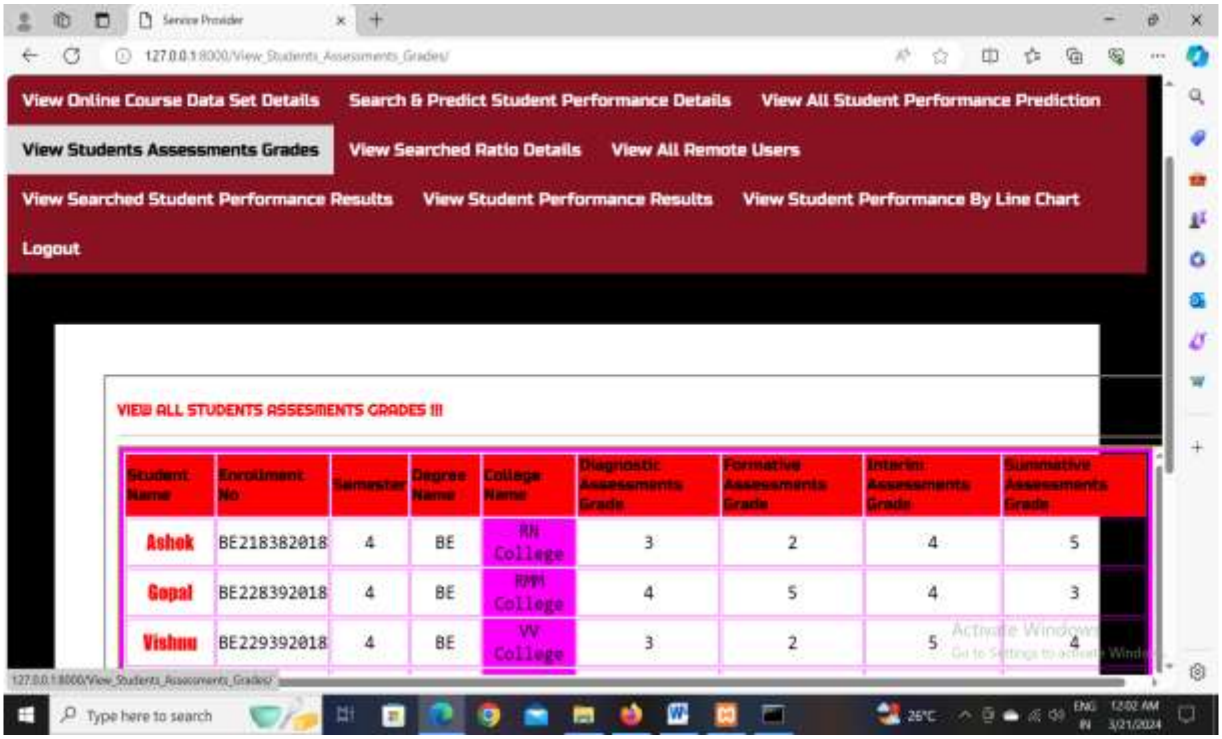
Screenshot 5.10: Search and Predict Student Performance Details


Service Provider
127.0.0.1:8000/View_All_StudentPerformance_Prediction_Details/
View Online Course Data Set Details
Search & Predict Student Performance Details
View All Student Performance Prediction
View Students Assessments Grades
View Searched Ratio Details
View All Remote Users
View Searched Student Performance Results
View Student Performance Results
View Student Performance By Line Chart
Logout
Type here to search
26°C
ENG IN
12:02 AM 3/21/2024

VIEW ALL STUDENT PERFORMANCE PREDICTION !!!

Student Name	Enrollment No	Gender	Semester	Degree Name	College Name	Performance
Ashok	BE218382018	Male	4	BE	RN College	50.0%
Gopal	BE228392018	Male	4	BE	RMM College	57.14285714285714%
Vishnu	BE229392018	Male	4	BE	VV College	50.0%
Govind	BE234732018	Male	4	BE	RR College	60.71428571428571%
Usha	BE236732018	Female	4	BE	Ram College	71.42857142857143%
Kavin	BE728732018	Male	4	BE	Shoba College	75.0%

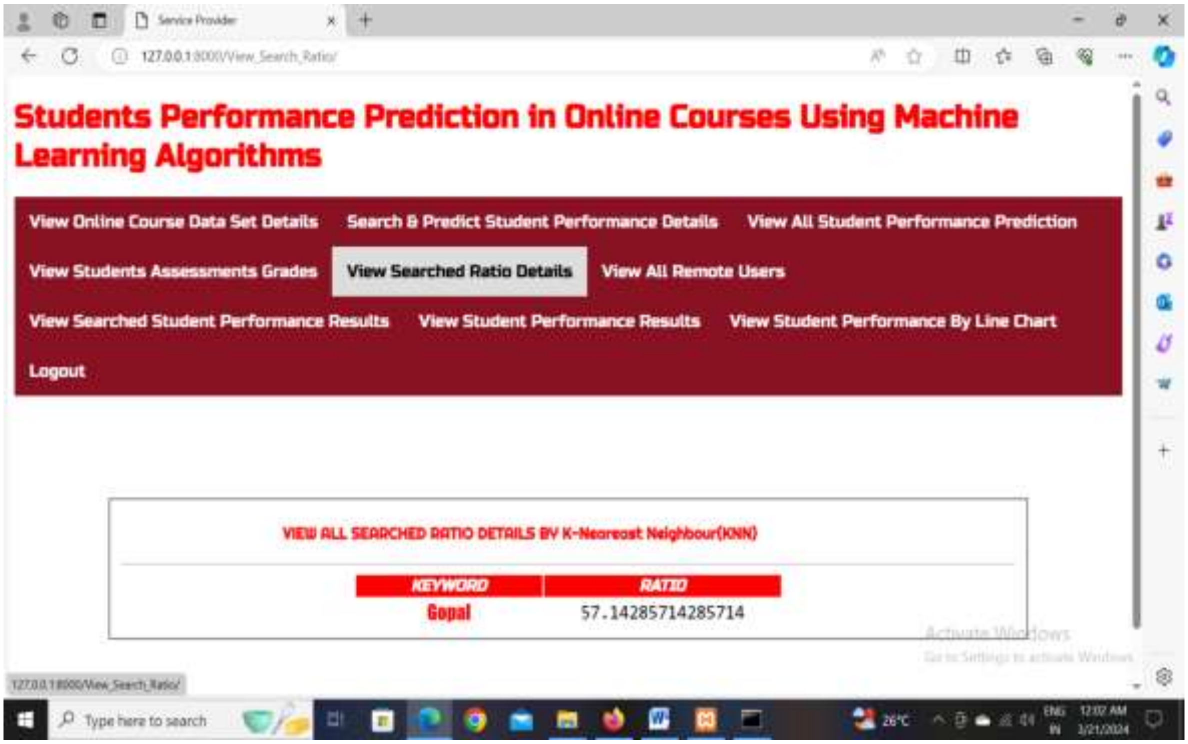
Screenshot 5.11: View All Student Performance Prediction


Service Provider
127.0.0.1:8000/View_Students_Assessments_Grades/
View Online Course Data Set Details
Search & Predict Student Performance Details
View All Student Performance Prediction
View Students Assessments Grades
View Searched Ratio Details
View All Remote Users
View Searched Student Performance Results
View Student Performance Results
View Student Performance By Line Chart
Logout
Type here to search
26°C
ENG IN
12:02 AM 3/21/2024

VIEW ALL STUDENTS ASSESMENTS GRADES !!!

Student Name	Enrollment No	Semester	Degree Name	College Name	Diagnostic Assessments Grade	Formative Assessments Grade	Interim Assessments Grade	Summative Assessments Grade
Ashok	BE218382018	4	BE	RN College	3	2	4	5
Gopal	BE228392018	4	BE	RMM College	4	5	4	3
Vishnu	BE229392018	4	BE	VV College	3	2	5	4

Screenshot 5.12: View Students Assessments Grades



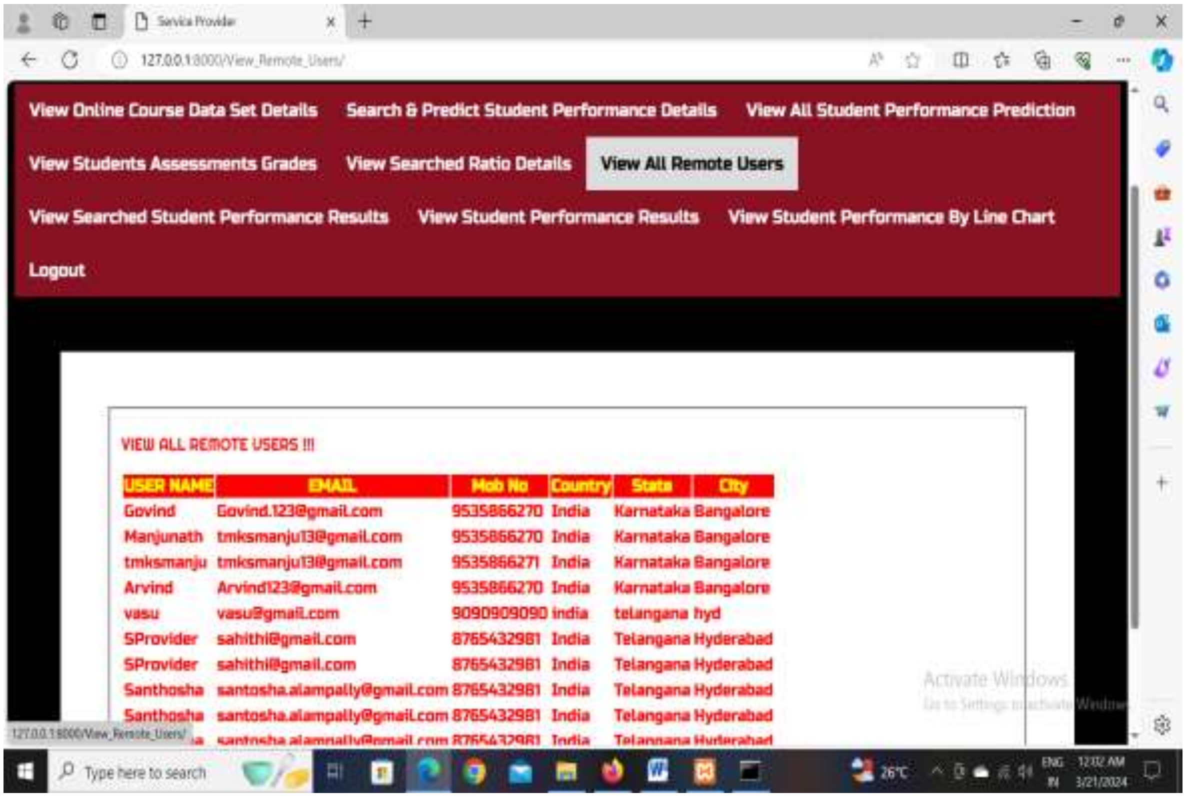
Service Provider
127.0.0.1:8000/View_Search_Ratio/
View Online Course Data Set Details
Search & Predict Student Performance Details
View All Student Performance Prediction
View Students Assessments Grades
View Searched Ratio Details
View All Remote Users
View Searched Student Performance Results
View Student Performance Results
View Student Performance By Line Chart
Logout
Type here to search

Students Performance Prediction in Online Courses Using Machine Learning Algorithms

VIEW ALL SEARCHED RATIO DETAILS BY K-Nearest Neighbour(KNN)

KEYWORD	RATIO
Gopal	57.14285714285714

Screenshot 5.13: View Searched Ratio Details

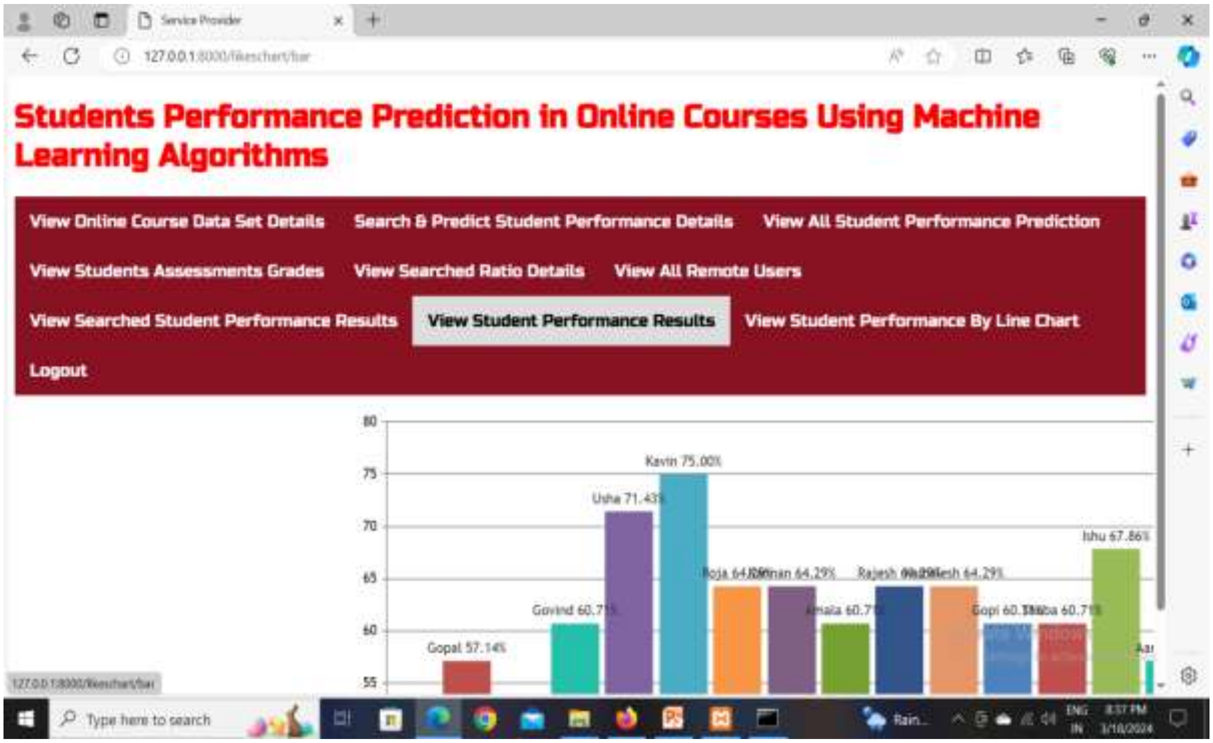


Service Provider
127.0.0.1:8000/View_Remote_Users/
View Online Course Data Set Details
Search & Predict Student Performance Details
View All Student Performance Prediction
View Students Assessments Grades
View Searched Ratio Details
View All Remote Users
View Searched Student Performance Results
View Student Performance Results
View Student Performance By Line Chart
Logout
Type here to search

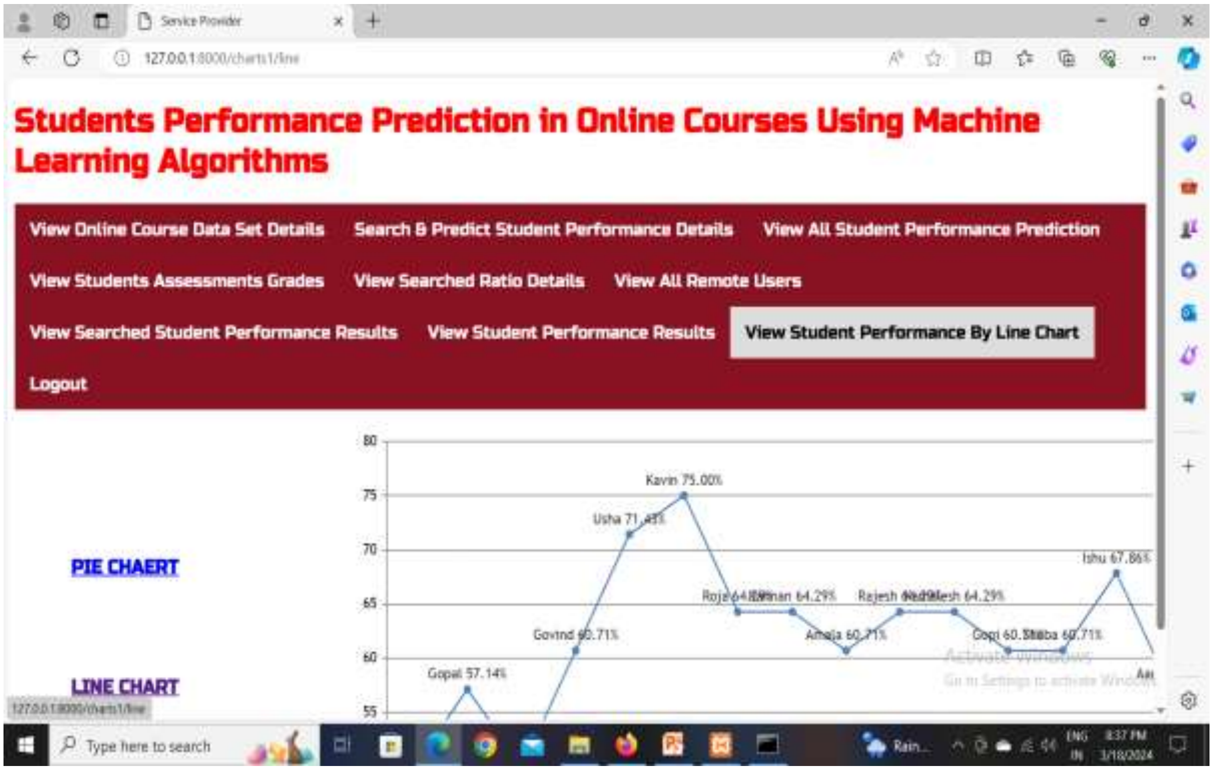
VIEW ALL REMOTE USERS !!!

USER NAME	EMAIL	Mob No	Country	State	City
Govind	Govind.123@gmail.com	9535866270	India	Karnataka	Bangalore
Manjunath	tmksmanju13@gmail.com	9535866270	India	Karnataka	Bangalore
tmksmanju	tmksmanju13@gmail.com	9535866271	India	Karnataka	Bangalore
Arvind	Arvind123@gmail.com	9535866270	India	Karnataka	Bangalore
vasu	vasu@gmail.com	9090909090	india	telangana	hyd
SProvider	sahithi@gmail.com	8765432981	India	Telangana	Hyderabad
SProvider	sahithi@gmail.com	8765432981	India	Telangana	Hyderabad
Santhosha	santosha.alampally@gmail.com	8765432981	India	Telangana	Hyderabad
Santhosha	santosha.alampally@gmail.com	8765432981	India	Telangana	Hyderabad
[illegible]	santosha.alampally@gmail.com	8765432981	India	Telangana	Hyderabad

Screenshot 5.14: View Searched Student Performance Results


Service Provider
127.0.0.1:8000/likeschart/bar
Students Performance Prediction in Online Courses Using Machine Learning Algorithms
View Online Course Data Set Details
Search & Predict Student Performance Details
View All Student Performance Prediction
View Students Assessments Grades
View Searched Ratio Details
View All Remote Users
View Searched Student Performance Results
View Student Performance Results
View Student Performance By Line Chart
Logout
80
75
70
65
60
55
Gopal 57.14%
Govind 60.71%
Usha 71.43%
Kavin 75.00%
Roja 64.29%
Mohan 64.29%
Amala 60.71%
Rajesh 64.29%
Mahesh 64.29%
Gopi 60.71%
Shoba 60.71%
Ishu 67.86%
Aar
Type here to search
8:37 PM
3/18/2024

Screenshot 5.15: View Student Performance Results


Service Provider
127.0.0.1:8000/charts1/line
Students Performance Prediction in Online Courses Using Machine Learning Algorithms
View Online Course Data Set Details
Search & Predict Student Performance Details
View All Student Performance Prediction
View Students Assessments Grades
View Searched Ratio Details
View All Remote Users
View Searched Student Performance Results
View Student Performance Results
View Student Performance By Line Chart
Logout
PIE CHAERT
LINE CHART
80
75
70
65
60
55
Gopal 57.14%
Govind 60.71%
Usha 71.43%
Kavin 75.00%
Roja 64.29%
Mohan 64.29%
Amala 60.71%
Rajesh 64.29%
Mahesh 64.29%
Gopi 60.71%
Shoba 60.71%
Ishu 67.86%
Aar
Type here to search
8:37 PM
3/18/2024

Screenshot 5.16: View Student Performance By Line Chart

6.TESTING

6.1TESTING

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, subassemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

6.2 TYPES OF TESTS

6.2.1 UNIT TESTING

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

6.2.2 INTEGRATION TESTING

Integration tests are designed to test integrated software components to determine if they actually run as one program. Integration tests demonstrate that although the components were individually satisfactory, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

6.2.3 FUNCTIONAL TESTING

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centered on the following items: Valid Input : identified classes of valid input must be accepted.

Invalid Input : identified classes of invalid input must be rejected.

Function : identified functions must be exercised.

Output : identified classes of application outputs must be exercised.

Systems/Procedures : interfacing systems or procedures must be invoked.

Organization and preparation of functional tests is focused on requirements,key functions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes, and successive processes must be considered for testing. Before functional testing is complete, additional tests are identified and the effective value of current tests is determined.

6.3 TEST CASES

6.3.1 CLASSIFICATION

S.NO	Test Case	Excepted Result	Result	Remarks(IF Fails)
1.	User Register	If User registration successfully.	Pass	If already user email exist then it fails.
2.	User Login	If Username and password is correct then it will getting valid page.	Pass	Un Register Users will not logged in.
3.	User View User	Show our dataset	Pass	If Data set Not Available fail.
4	User Prediction	Display Review with true results	Pass	Results not True Fail
5.	Service Provider login	Admin can login with his login credential. If success he get his home page	Pass	Invalid login details will not allowed here
6.	Service Provider can activate the register users	Admin can activate the register user id	Pass	If user id not found then it won't login
7.	Results	Student Performance Prediction Done accurately Using ML Algorithms.	Pass	If not used ML Algorithms Accuracy may Decreased.

7.CONCLUSION & FUTURE SCOPE

7.1PROJECT CONCLUSION

In conclusion, our project represents a significant step forward in leveraging technology to enhance the educational experience. By harnessing the power of machine learning algorithms, we have developed a system capable of predicting students' performance in online courses with remarkable accuracy .Through data collection, preprocessing, and the application of advanced predictive models, we have provided educators with valuable insights into student behaviors and learning patterns. This enables them to identify at-risk students early, tailor interventions, and support strategies to individual needs, ultimately fostering improved academic outcomes.

7.2FUTURE SCOPE

Development of Adaptive Learning Systems: Leveraging predictive analytics, the project can evolve into developing adaptive learning systems that dynamically adjust course content and pacing based on individual student needs .

Enhancement of Predictive Models: Continuously refining and improving the predictive models by exploring new machine learning algorithms, feature engineering techniques, and ensemble methods can lead to more accurate predictions and better support for educators in identifying at-risk students early and intervening proactively.

Incorporation of Explainable AI (XAI): Integrating explainable AI techniques into the predictive models can enhance transparency and trust by providing clear explanations for model predictions.

Ethical Considerations and Privacy Protection: As predictive analytics in education raise ethical concerns regarding privacy and data usage, future iterations of the project should prioritize implementing robust privacy protection mechanisms.

8.BIBLIOGRAPHY

8.1REFERENCES

[1]K. F. Hew and W. S. Cheung, “Students’ and instructors’ use of massive open online courses (MOOCs): Motivations and challenges,” Educ. Res.Rev., vol. 12, pp. 45–58, 2014.

[2] H. B. Shapiro, C. H. Lee, N. E. Wyman Roth, K. Li,M. Çetinkaya-Rundel, and D. A. Canelas,“Understanding the massive open online course(MOOC) student experience: An examination of attitudes, motivations, and barriers,” Comput. Educ., vol. 110, pp. 35–50, 2017.

[2] J. Renz, F. Schwerer, and C. Meinel,“openSAP: Evaluating xMOOC Usage and Challenges for Scalable and Open Enterprise Education.,” Int. J. Adv. Corp. Learn., vol. 9, no. 2, pp. 34–39, 2016.

[3]K. R. Koedinger, E. A. Mclaughlin, and J. Stamper,“Automated Student Model Improvement,” in Educational Data Mining, proceedings of the 5th International Conference on, 2012, pp. 17–24.42, no. 2, 2016.

[4] S. Zutshi, S. O’Hare, and A. Rodafinos, “Experiences in MOOCs: The Perspective of Students,” Am. J.Distance Educ., vol. 27, no. 4, pp. 218–227, 2013.

[5]Z. Wang, T. Anderson, L. Chen, and E. Barbera,“Interaction pattern analysis in cMOOCs based on the connectivist interaction and engagement framework,” Br. J. Educ. Technol., vol. 48, no. 2, pp. 683–699, 2017.

8.2 GITHUB LINK

https://github.com/rajendar2001/Students_perfomance_prediction_in_online_courses