Student Examination Portal

Submitted by

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Department: Basic Science and Humanities

Under the supervision of Dr. Indrajit De

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PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE FIRST SEMESTER



DEPARTMENT OF BASIC SCIENCE AND HUMANITITES INSTITUTE OF ENGINEERING AND MANAGEMENT, KOLKATA



CERTIFICATE OF RECOMMENDATION

We hereby recommend that the project prepared under our supervision by Ishan Chattopadhaya entitled Student Examination Portal be accepted in partial fulfillment of the requirements for the degree of partial fulfillment of the first semester.

Head of the Department Basic Sciences and Humanities IEM, Kolkata **Project Supervisor**

1 Introduction

The Exam Management System is an essential part of any educational institution, as it can help keep track of who gives the exam and how they perform, in the form of graphs and statistics. This is one such system which performs the above mentioned tasks, coded in python.

1.1 Objective

The objectives of the management system are as follows:

- To make the task of storing data about students exams easier
- To help represent that data graphically
- To generate report cards automatically for each student with grade
- To aid the teachers and staff to organize and collate data after exam

1.2 Organization of the Project

The project code is organized by first defining the functions that will be used in the project and also the functions which are used of determining the grades, generating the graphs and all other necessary functionalities.

The next section is where the files are created and the data is written.

The last section is where the graphs are displayed regarding the marks obtained.

Initially program asks for inputs which the user should follow and the data is stored on the csv files. Then the graphs are displayed according to the data input and then shown.

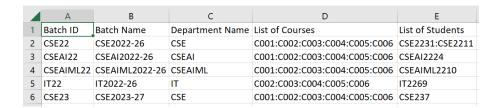
2 Database Descriptions

The CSV files are generated and used as database in the project. There are a total of 4 files created:

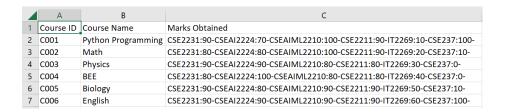
- Batch.csv stores information about the students and respective batches
- Course.csv stores the marks obtained by certain students in the particular course
- Department.csv stores the different batches present in each department
- Student.csv stores entered students roll no and Batch ID

2.1 Database Samples

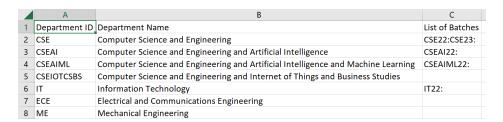
Batch.csv



Course.csv



Department.csv

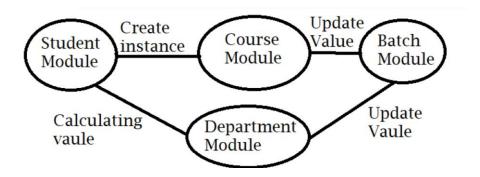


Student.csv

	А	В	С	D
1	Student ID	Name	Class Roll Number	Batch ID
2	CSE2231	IC	31	CSE22
3	CSEAI2224	AC	24	CSEAI22
4	CSEAIML2210	AS	10	CSEAIML22
5	CSE2211	XY	11	CSE22
6	IT2269	YZ	69	IT22
7	CSE237	ZZ	7	CSE23

3 Data Flow and E-R Diagrams

Demonstrate the dependency of all the python modules written using data flow diagrams



4 Programs

Provide the python programs of the various modules.

1) rootDir/exammanagementportal.py

```
import os
import csv
import subprocess
import time
import sys
try:
  import matplotlib.pyplot as plt
except:
  subprocess.run(['pip', 'install', 'matplotlib'])
  import matplotlib.pyplot as plt
path='C:/Users/NandiniC/Desktop/Ishan/Python files/Project v2/Database Related Files'
print('*'*50)
print("STUDENT EXAMINATION PORTAL")
print('*'*50)
#All the functions used throughout the code
def loading_screen():
  for i in range (10):
     sys.stdout.write("\rLoading" + "." * i)
     sys.stdout.flush()
```

```
time.sleep(0.5)
  sys.stdout.write("\rLoading complete!")
def createfile(name,lst):
  with open(f'{path}/{name}','a',newline=")as f:
     script= csv.writer(f)
     script.writerow(lst)
    print(f"{name} file has been UPDATED")
def percent(num):
  if stream.lower()=='cse' or stream.lower()=='cseai' or stream.lower()=='cseaiml' or
stream.lower()=='cseiotcsbs':
     num=(num*100)//600
  elif stream.lower()=='it' or stream.lower()=='ece' or stream.lower()=='me':
     num=(num*100)//500
  return num
def grade(num):
  if num>=90:
     return("Outstanding Performance... You have passed with grade A.")
  elif num<90 and num>=80:
     return("Excellent Performance... You have passed with grade B.")
  elif num<80 and num>=70:
     return("Good Performance... You have passed with grade C.")
  elif num<70 and num>=60:
     return("Average performance... You have passed the exam with grade D.")
  elif num<60 and num>=50:
    return("Below average... You have passed with grade E.")
  else:
    return("Extremely poor performance... You have Failed and got F.")
def count(lst):
  num=0
  for i in 1st:
    if str(type(i))=="<class 'int'>":
       num+=1
    else:
       pass
  return num
def add(lst):
  plus=0
  for i in lst:
    try:
       plus+=i
```

```
except:
       pass
  return plus
def duplicate(file,attr,pos=0):
  with open(f'\{path\}/\{file\}', 'r') as f:
     reader = csv.reader(f)
     dup_lst=[]
     for i in reader:
       dup_lst += [i[pos]]
  if attr in dup_lst:
     return True
  else:
     return False
def choice(stream):
  if stream.lower()=='cse' or stream.lower()=='cseai' or stream.lower()=='cseaiml' or
stream.lower()=='cseiotcsbs':
     return ("C001:C002:C003:C004:C005:C006")
  elif stream.lower()=='it' or stream.lower()=='ece' or stream.lower()=='me':
     return ("C002:C003:C004:C005:C006")
def get_batch():
  with open(f'C:/Users/NandiniC/Desktop/Ishan/Python files/Project v2/Database
Related Files/Batch.csv','r') as f:
     reader=csv.reader(f)
     rows=[row for row in reader]
     column=[]
     for i in range(len(rows)):
       if i==0:
          pass
       else:
          column+=[rows[i][0]]
  return column
def remove(string):
  with open(f'C:/Users/NandiniC/Desktop/Ishan/Python files/Project v2/Database
Related Files/Student.csv','r+',newline=") as f:
     script=csv.reader(f)
     rows=[row for row in script]
     for i in rows:
       if i[0] == string:
          rows[rows.index(i)]=[",",","]
       else:
          pass
     f.seek(0)
     f.truncate()
```

```
writer=csv.writer(f)
writer.writerows(rows)
```

```
def course_graph():
  color_lst=['#C70039','#9BB1F2','#FFC300','#FF5733','#DAAFB1','#86B7C8']
  fig, ax = plt.subplots()
  legend_properties = {'weight':'heavy'}
  ax.set_facecolor("Black")
  ax.tick_params(axis="both", colors="white")
  fig.set_facecolor("Black")
  ax.set_xlabel('Grades----->', color="white")
  ax.set_ylabel('No. of Students----->', color="white")
  ax.spines["bottom"].set_color("white")
  ax.spines["left"].set color("white")
  ax.xaxis.label.set_weight("heavy")
  ax.yaxis.label.set_weight("heavy")
  count=0
  with open(f'{path}/Course.csv','r')as f:
     script= csv.reader(f)
     rows=[row for row in script]
     req=[]
     for i in range(len(rows)):
       if i==0:
          pass
       else:
          req += [rows[i][2]]
     lst=[['Python',(req[0].split('-'))[0:-1]],
        ['Math',(req[1].split('-'))[0:-1]],
        ['Physics',(req[2].split('-'))[0:-1]],
        ['BEE',(req[3].split('-'))[0:-1]],
        ['Biology',(req[4].split('-'))[0:-1]],
        ['English',(req[5].split('-'))[0:-1]]]
     for i in range(len(lst)):
       for j in range(len(lst[i][1])):
            lst[i][1][j]=grade(int((lst[i][1][j].split(':'))[-1]))[-2]
          except:
            lst[i][1][j]="
     for k in range(6):
       a=lst[k][1].count('A')
       b=lst[k][1].count('B')
       c=lst[k][1].count('C')
       d=lst[k][1].count('D')
```

```
e=lst[k][1].count('E')
       f=lst[k][1].count('F')
       lst[k][1] = \{ 'A':a, 'B':b, 'C':c, 'D':d, 'E':e, 'F':f \}
    for j in 1st:
       x=list(i[1].keys())
       y=list(j[1].values())
       ax.plot(x, y,marker=",",color=color_lst[count],label=j[0],linewidth=3)
       leg=plt.legend(fontsize=10,loc="upper right",
facecolor="Black",edgecolor="Black",prop=legend_properties)
       count+=1
    for text in leg.get_texts():
       text.set_color('White')
     plt.show()
def batch_graph(arg):
  with open(f'{path}/Batch.csv','r') as f:
    reader=csv.reader(f)
    req="
    rows=[row for row in reader]
    for i in range(len(rows)):
       if arg==rows[i][0]:
          req=rows[i][4]
          break
  req_lst=req.split(':')
  with open(f'{path}/Course.csv','r') as f:
     reader=csv.reader(f)
    rows=[row for row in reader]
    column=[]
    for i in range(len(rows)):
       if i==0:
          pass
       else:
          column+=[rows[i][2]]
    new column=[]
    for j in range(len(column)):
       new_column+=(column[j].split('-'))[0:-1]
  new_req_lst=[]
  temp=[]
  for i in req_lst:
    for j in range(len(new_column)):
       if i in new_column[j]:
          temp+=[(new_column[j].split(':'))[-1]]
    new_req_lst+=[[[i]]+[temp]]
```

```
temp=[]
  lst=[]
  temp=0
  grade lst=[]
  for i in range(len(new_req_lst)):
     for j in range(6):
       try:
          temp+=int(new_req_lst[i][1][j])
       except:
          pass
     lst+=[new\_req\_lst[i][0]+[temp]]
     temp=0
  for i in range(len(lst)):
     if lst[i][0][:3]=='CSE':
       grade_lst += [grade((lst[i][1]*100)//600)[-2]]
       lst[i][1]=grade((lst[i][1]*100)//600)[-2]
     else:
       grade_lst+=[grade((lst[i][1]*100)//500)[-2]]
       lst[i][1]=grade((lst[i][1]*100)//500)[-2]
grade_no_lst={'A':grade_lst.count('A'),'B':grade_lst.count('B'),'C':grade_lst.count('C'),'D'
:grade_lst.count('D'),'E':grade_lst.count('E'),'F':grade_lst.count('F')}
  labels = list(grade no lst.keys())
  sizes = list(grade_no_lst.values())
  color lst=['#C70039','#9BB1F2','#FFC300','#FF5733','#DAAFB1','#86B7C8']
  explode = (0.01, 0.1, 0.02, 0.05, 0.03, 0.1)
  new labels=[]
  for i in range(len(labels)):
     new_labels+=[f'{labels[i]}: {str(sizes[i])}']
  fig,ax = plt.subplots()
  ax.set_facecolor("Black")
  fig.set facecolor("Black")
  plt.rcParams['font.weight'] = 'heavy'
  #plt.rcParams['font.size'] = '1'
  patches, texts=ax.pie(sizes, labels=new labels,
colors=color_lst,explode=explode,shadow=True,startangle= -90,textprops={'fontsize':
0})
  centre_circle = plt.Circle((0,0),0.60,fc='black')
  fig = plt.gcf()
  fig.gca().add_artist(centre_circle)
  legend properties = {'weight':'heavy'}
```

```
leg=plt.legend(fontsize=10,loc="center",
facecolor="Black",edgecolor="Black",prop=legend_properties)
  for text in leg.get_texts():
     text.set_color('white')
  plt.title('Overall Grades vs No. of Students',color='White',weight='heavy')
  plt.axis('equal')
  plt.show()
def department_graph():
  need={}
  with open(f'{path}/Batch.csv','r') as f:
     reader=csv.reader(f)
     batch=[batch[0] for batch in reader]
     batch=batch[1:]
  for arg in batch:
     avg=0
     with open(f'{path}/Batch.csv','r') as f:
       reader=csv.reader(f)
       req="
       rows=[row for row in reader]
       for i in range(len(rows)):
          if arg==rows[i][0]:
            req=rows[i][4]
            break
     req_lst=req.split(':')
     with open(f'{path}/Course.csv','r') as f:
       reader=csv.reader(f)
       rows=[row for row in reader]
       column=[]
       for i in range(len(rows)):
          if i==0:
            pass
          else:
            column+=[rows[i][2]]
       new column=[]
       for j in range(len(column)):
          new_column+=(column[j].split('-'))[0:-1]
     new_req_lst=[]
     temp=[]
     for i in req_lst:
       for j in range(len(new_column)):
          if i in new column[i]:
            temp+=[(new_column[j].split(':'))[-1]]
       new_req_lst+=[[[i]]+[temp]]
       temp=[]
     lst=[]
```

```
temp=0
     grade_lst=[]
    for i in range(len(new_req_lst)):
       for j in range(6):
          try:
            temp+=int(new_req_lst[i][1][j])
          except:
            pass
       lst+=[new\_req\_lst[i][0]+[temp]]
       temp=0
    for i in range(len(lst)):
       if lst[i][0][:3]=='CSE':
          lst[i][1]=(lst[i][1]*100)/600
       else:
          lst[i][1]=(lst[i][1]*100)/500
    for i in range(len(lst)):
       avg = lst[i][1]
    avg=int(avg//len(lst))
    need[arg]=avg
  xdata = list(need.keys())
  vdata = list(need.values())
  color_lst=['#C70039','#9BB1F2','#FFC300','#FF5733','#DAAFB1','#86B7C8']
  fig,ax = plt.subplots()
  ax.set_facecolor("Black")
  fig.set facecolor("Black")
  ax.set_xlabel("X axis", color="white")
  ax.set ylabel("Y axis", color="white")
  ax.spines["bottom"].set_color("white")
  ax.spines["left"].set_color("white")
  ax.spines['bottom'].set_linewidth(2)
  ax.spines['left'].set_linewidth(2)
  ax.xaxis.label.set_weight("heavy")
  ax.yaxis.label.set weight("heavy")
  ax.tick_params(axis='x', labelcolor='white', labelsize=10,color='white',width=2)
  ax.tick params(axis='y', labelcolor='white', labelsize=10,color='white', width=2)
  plt.barh(xdata,ydata,color=color lst,height=0.3,align='center')
  plt.title('Histogram of Average of Students vs
Batch',color='white',pad=17,fontweight='bold')
  plt.xlabel('Average----->')
  plt.ylabel('Batch----->', labelpad=15)
  plt.show()
```

```
#Creation of Folder and all the Modules recquired...
try:
  os.makedirs(f'{path}/ReportCards')
  message=True
except:
  message=False
while message:
  createfile('Batch.csv', ['Batch ID', 'Batch Name', 'Department Name', 'List of
Courses', 'List of Students'])
  createfile('Course.csv',['Course ID','Course Name','Marks Obtained'])
  with open(f'{path}/Course.csv','a',newline=")as f:
     script= csv.writer(f)
     script.writerow(['C001','Python Programming'])
     script.writerow(['C002','Math'])
     script.writerow(['C003','Physics'])
     script.writerow(['C004','BEE'])
     script.writerow(['C005','Biology'])
     script.writerow(['C006','English'])
  createfile('Department.csv',['Department ID','Department Name','List of Batches'])
  with open(f'{path}/Department.csv','a',newline=")as f:
     script= csv.writer(f)
     script.writerow(['CSE','Computer Science and Engineering'])
     script.writerow(['CSEAI','Computer Science and Engineering and Artificial
Intelligence'])
     script.writerow(['CSEAIML','Computer Science and Engineering and Artificial
Intelligence and Machine Learning'])
     script.writerow(['CSEIOTCSBS','Computer Science and Engineering and Internet
of Things and Business Studies'])
     script.writerow(['IT','Information Technology'])
     script.writerow(['ECE','Electrical and Communications Engineering'])
     script.writerow(['ME','Mechanical Engineering'])
  createfile('Student.csv',['Student ID','Name','Class Roll Number','Batch ID'])
  break
print('\n', 'Computer Science and Engineering: CSE', '\n',
    'Computer Science and Engineering and Artificial Intelligence: CSEAI', '\n',
    'Computer Science and Engineering and Artificial Intelligence and Machine
Learning: CSEAIML','\n',
    'Computer Science and Engineering and Internet of Things and Business Studies:
CSEIOTCSBS','\n',
    'Information Technology: IT', '\n',
   'Electrical and Communications Engineering: ECE','\n',
   'Mechanical Engineering : ME','\n')
print("Write all the stream name as specified above")
print()
```

```
student_no=int(input("No. of students whose data you want to input: "))
print()
print('*'*50)
for i in range(student_no):
  name=input("Enter Student's Name : ")
  batch=input("Batch (e.g. 2022-26):")
  stream=input("Stream (e.g. CSE) : ")
  roll=input("Class Roll Number : ")
  batch_id=stream+batch[2:4]
  student_id=batch_id+roll
  batch_name=stream+batch
  if duplicate('Student.csv',student_id,0):
     print("the student is already present in the directory")
     print(f"You can find your report card here:
{path}/ReportCards/{student_id}_{name}.txt")
  else:
     print()
     print("The subjects are [Python, Math, Physics, BEE, Biology, English]")
     print('please enter the subjects marks in the above mentioned order in a list type
and if you dont have a particular subject write there "null" (e.g.
[90,80,"null",75,69,85])')
     print('Each Subject is ot of 100 marks')
    print()
     marks_lst=eval(input("Enter the Marks list:"))
    total marks=add(marks lst)
    print()
     with open(f"{path}/ReportCards/{student id} {".join(name.split())}.txt",'w') as f:
       f.writelines([f'Name of the student : {name} \n',
                f'Class Roll of the student : {roll} \n',
                f'Stream of the student : {stream} \n',
                f'Your Student ID is : {student id}\n',
                '\n'.
                f'Marks obtained in Math is : {marks lst[1]} \n',
                f'Marks obtained in Python is : {marks_lst[0]} \n',
                f'Marks obtained in Physics is : {marks_lst[2]} \n',
                f'Marks obtained in BEE is : {marks_lst[3]} \n',
                f'Marks obtained in Biology is : {marks_lst[4]} \n',
                f'Marks obtained in English is : {marks_lst[5]} \n'])
       f.write('\n')
       f.write(f'You have got {total_marks} in total with {percent(total_marks)}%\n')
       f.write(grade(total_marks/count(marks_lst)))
```

```
createfile('Student.csv',[student_id,name,roll,batch_id])
     print(f"You can find your report card here:
{path}/ReportCards/{student_id}_{".join(name.split())}.txt")
     openpath=f"{path}/ReportCards/{student_id}_{".join(name.split())}.txt"
     subprocess.run(['start',openpath], shell=True)
     ask=input("Do you want to remove this name from database now is the time (Y/N)
:")
     if ask.lower()=='n':
       if duplicate('Batch.csv',batch id,0):
          with open(f'{path}/Batch.csv','r+',newline=") as f:
            script=csv.reader(f)
            rows=[row for row in script]
            for i in rows:
               if batch id==i[0]:
                 rows[rows.index(i)][4]+=f':{student_id}'
            f.seek(0)
            f.truncate()
            writer=csv.writer(f)
            writer.writerows(rows)
          print("Batch.csv has been updated")
       else:
createfile('Batch.csv', [batch id,batch name,stream,choice(stream),student id])
       with open(f'{path}/Course.csv','r+',newline=") as f:
          script=csv.reader(f)
          rows=[row for row in script]
          for i in range(len(rows)):
            if i==0:
               pass
            else:
               try:
                 rows[i][2]+=f'{student id}:{marks lst[i-1]}-'
               except:
                 rows[i].append(f'{student id}:{marks lst[i-1]}-')
          f.seek(0)
          f.truncate()
          writer=csv.writer(f)
          writer.writerows(rows)
     else:
       remove(student id)
       subprocess.call("TASKKILL /F /IM notepad.exe", shell=True)
       os.remove(openpath)
       print('Your details have been successfully removed from the directory')
```

```
print('-'*50)
  print()
try:
  with open(f'{path}/Department.csv','r+',newline=") as f:
     script=csv.reader(f)
     rows=[row for row in script]
     lst=get_batch()
     for i in 1st:
       for j in rows:
          if i[0:-2]==i[0]:
            try:
               if i in j[2]:
                  pass
               else:
                 rows[rows.index(j)][2]+=f'\{i\}:'
            except:
               rows[rows.index(j)].append(f'{i}:')
     f.seek(0)
     f.truncate()
     writer=csv.writer(f)
     writer.writerows(rows)
except:
  print("Nothing to add in Department.csv")
#Creation of the Graphs...
print()
print("Give the details Below to see the Batchwise percent Graph")
batch=input("Which batch they are in (e.g. 2022-26): ")
stream=input("Which Stream are they in (e.g. CSE): ")
print('Please Close the Figure window after viewing to continue')
batch id=stream+batch[2:4]
with open(f'{path}/Batch.csv','r') as f:
  reader=csv.reader(f)
  batch=[batch[0] for batch in reader]
  batch=batch[1:]
while True:
  if batch_id in batch:
     batch_graph(batch_id)
     break
  else:
```

```
print(f'details with {batch_id} this Batch ID is not in the directory')
     ask=input("Do you want to continue (y/n): ")
    if ask.lower()=='y':
       batch=input("Which batch they are in (e.g. 2022-26):")
       stream=input("Which Stream are they in (e.g. CSE) : ")
       batch_id=stream+batch[2:4]
       continue
    else:
       print('OK')
       break
print()
print('The overall Course graph will come now')
print('Please Close the Figure window after viewing to continue')
loading_screen()
course_graph()
print()
print()
print("The overall Department wise average graph will come now")
print('Please Close the Figure window after viewing to continue')
loading_screen()
department_graph()
print()
print()
last=input("Press Enter to exit")
subprocess.call("TASKKILL /F /IM notepad.exe", shell=True)
```

5 Outputs

Describe sample outputs to demonstrate the functionalities in programs. You may use screenshots.

The user interface

```
Computer Science and Engineering : CSE
Computer Science and Engineering and Artificial Intelligence : CSEAI
Computer Science and Engineering and Artificial Intelligence and Machine Learning : CSEAIML
Computer Science and Engineering and Artificial Intelligence and Machine Learning : CSEAIML
Computer Science and Engineering and Internet of Things and Business Studies : CSEIOTCSBS
Information Technology : IT
Electrical and Communications Engineering : ECE
Mechanical Engineering : ME

drite all the stream name as specified above
No. of students whose data you want to input : 1

Enter Student's Name : XX
Batch (e.g. 2022-26) : 2022-26
Stream (e.g. CSE) : CSE
Class Roll Number : 9

The subjects are [Python,Math,Physics,BEE,Biology,English]
please enter the subjects marks in the above mentioned order in a list type and if you dont have a particular subject wr ite there "null" (e.g. [99,80,"null",75,69,85])
Each Subject is ot of 100 marks

Enter the Marks list :
```

The graphs and report cards that are generated:

