Student Performance Database

Submitted by

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Department: Basic Science and Humanities

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

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

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CERTIFICATE OF RECOMMENDATION

We hereby recommend that the project prepared under our supervision by **Saswata Paul,** entitled Student Performance Database be accepted in partial fulfilment of the requirements for the degree of partial fulfilment of the first semester.

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

1 Introduction

This project allows users to keep track of students' performance by creating a database to keep a record of their marks and grades.

1.1 Objective

This project allows users to keep track of students' performance by creating a database to keep a record of their marks and grades. All the data will be segregated on the basis of stream, section, and roll numbers.

1.2 Organization of the Project

For the successful running of the project, the following modules were imported:
OS
CSV
subprocess
time
sys
matplotlib

2 Programs

Provide the python programs of the various modules.

1) functions used throughout the code

```python
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!")
```

```python
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 the exam with
grade A."
    elif num < 90 and num >= 80:
        return "Excellent Performance... You have passed the exam with
grade B."
    elif num < 80 and num >= 70:
        return "Good Performance... You have passed the exam with grade
C."
    elif num < 70 and num >= 60:
        return "Your performance is average... Work hard... You have
passed the exam with grade D."
    elif num < 60 and num >= 50:
        return "Your performance is below average... There is massive
scope of improvement... You have barely passed the exam with grade E."
    else:
        return "Extremely poor performance... You have Failed the Exam 
and got F."


def count(lst):
    num = 0
    for i in lst:
        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:/PythonProgrammingProject_main-folder/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:/PythonProgrammingProject_main-folder/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)
```

```python
        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]],
            ["Chemistry", (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])):
                try:
                    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 lst:
            x = list(j[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]
```

```python
        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:
```

```python
        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":
            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())
    ydata = 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()
```

2) creation of folders and modulus required:

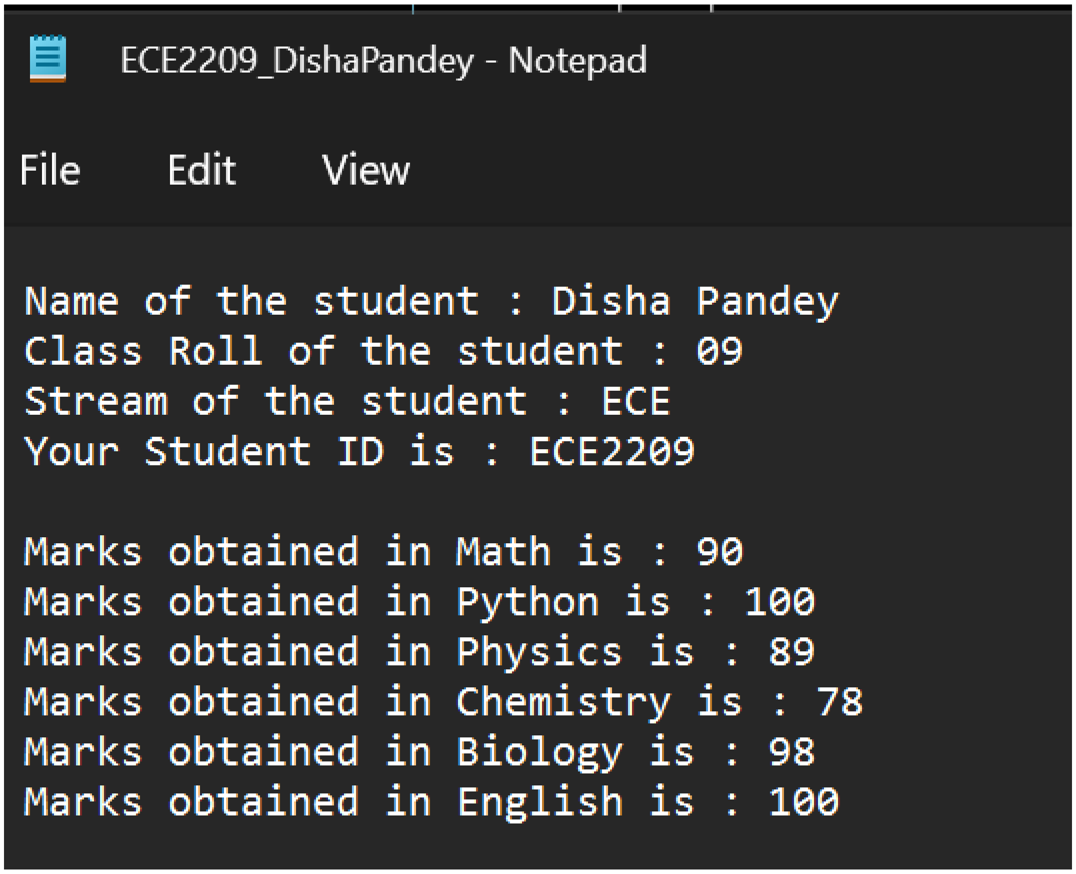
```
try:
    os.makedirs(f"{path}/ReportCards")
    message = True
```

```python
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", "Chemistry"])
        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"])
    createfile("Examination.csv", ["Course Name", "Student ID",
"Marks"])
    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",
```

```python
    "\n",
)
print(
    "Please write all the stream name in short form as mentioned above
and in capital letters only!!!"
)
print()


student_no = int(input("Enter the 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("which batch he/she is in (e.g. 2022-26) : ")
    stream = input("Which Stream are you in (e.g. CSE) : ")
    roll = input("What is your 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,Chemistry,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. [100,100,"null",75,69,85])'
        )
        print("Each subject is out 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 Chemistry 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 lst:
            for j in rows:
                if i[0:-2] == j[0]:
                    try:
                        if i in j[2]:
                            pass
                        else:
                            rows[rows.index(j)][2] += f"{i}:"
                    except:
                        rows[rows.index(j)].append(f"{i}:")
                    break
        f.seek(0)
        f.truncate()
        writer = csv.writer(f)
        writer.writerows(rows)

except:
    print("Nothing to add in Department.csv")
```

3 Outputs

The sample outputs demonstrate the functionalities of programs.



```
Name of the student : Disha Pandey
Class Roll of the student : 09
Stream of the student : ECE
Your Student ID is : ECE2209

Marks obtained in Math is : 90
Marks obtained in Python is : 100
Marks obtained in Physics is : 89
Marks obtained in Chemistry is : 78
Marks obtained in Biology is : 98
Marks obtained in English is : 100
```