Project Report on

COLLEGE GRADING SYSTEM

Submitted to

JAYSHREE PERIWAL HIGH SCHOOL

3, Chitrakoot Scheme, Jaipur

In partial fulfilment
of the requirements for

All India Senior School Certificate Examination 2021

Of

CENTRAL BOARD OF SECONDARY EDUCATION

Submitted by:

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ACKNOWLEDGEMENT

We would like to thank everyone who helped us to accomplish this project.

Our sincere thanks to ***respected teachers*** who have helped us with their valuable suggestions and support throughout the development of the project.

We are highly thankful to our project guide **Ms. Himanshi Sharma** for providing guidance and support at every stage of the project.

We are extremely grateful to **Mrs. Jayshree Periwal**, ***Director*** and **Mrs. Madhu Maini**, ***Principal*** of JAYSHREE PERIWAL HIGH SCHOOL, JAIPUR, for providing us a very good computer lab, due to which this project became possible.

Lakshita Gopalani

Isha Sharma

Yashvardhan Goyal

CERTIFICATE OF ORIGINALITY

This is to certify that the project entitled **"COLLEGE GRADING SYSTEM**" submitted to **JAYSHREE PERIWAL HIGH SCHOOL** in partial fulfilment of the requirement for **All India Senior School Certificate Examination (AISSCE) 2021** of **CBSE**, is original work carried out by **Lakshita Gopalani, Isha Sharma & Yashvardhan Goyal** under my guidance.

The matter embodied in this project is genuine work done by the students and has not been submitted of any course of study.

……..

Signature of the guide

Date: ……..

Name: **Ms. Himanshi Sharma**

JAYSHREE PERIWAL HIGH SCHOOL

Jaipur

CONTENTS

OBJECTIVE AND SCOPE OF THE PROJECT

Objective:

The main objective of the project is to manage the details and result of students of an Engineering college in various forms.

This project is useful in adding, deleting and modifying the details of the students, their Grades and Grade Points in various subjects; displaying graphical analysis; displaying the overall CPI (Cumulative Performance Index) of students; and printing the report card of a student.

Scope:

This project is developed for ABC Engineering College, Delhi.

Further, it can be easily customized to maintain any other college or school's grading system.

This project is developed as a part of class XII standard course.

PROBLEM DEFINITION

The project "**College Grading System**" is used to store, modify, view the data of students enrolled in ABC Engineering College, Delhi.

The project allows the user to choose from the following options:

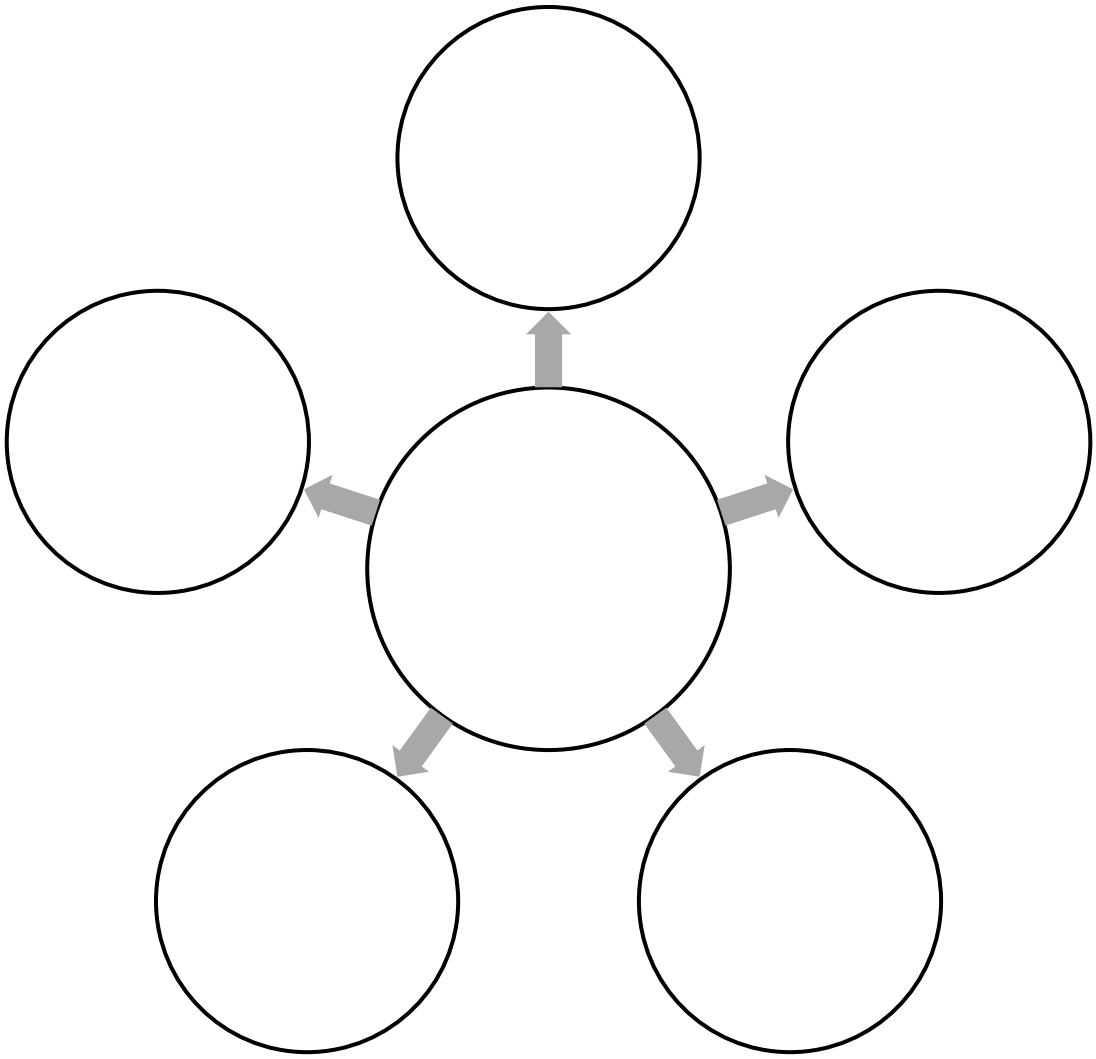
1. To enter the details and grades of a new student
2. To delete the details and grades of an existing student
3. To display subject-wise Grades
4. To display CPI of all/individual students
5. To display Report Card of the student
6. To display Bar Chart analyzing grades of students
7. To display details of students enrolled
8. To display the description of grading system

As a developer, you are required to design the project and develop it as per the college needs.

Suitable assumptions can be made during implementation. A proper normalized database is to be maintained in the RDBMS and the front end is to be developed using advanced interface controls.

User-friendly interface is to be generated.

CONTEXT DIAGRAM

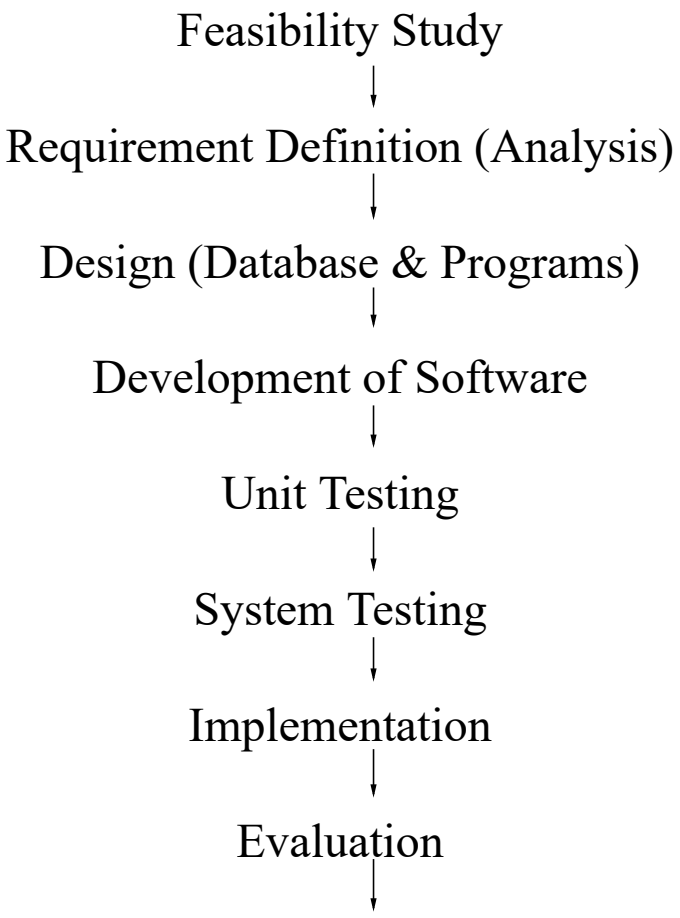


LIFE CYCLE OF THE PROJECT

System Development Life Cycle (SDLC)

The System Development Life Cycle (SDLC) is a set of activities that analysts, designers and users carry out to develop and implement an Information System.

The SLDC consists of following activities:



Maintenance

DETAILS OF HARDWARE AND SOFTWARE USED

Platform: Windows 10

Tools: Python IDLE

RDBMS: MySQL

Hardware Specifications:

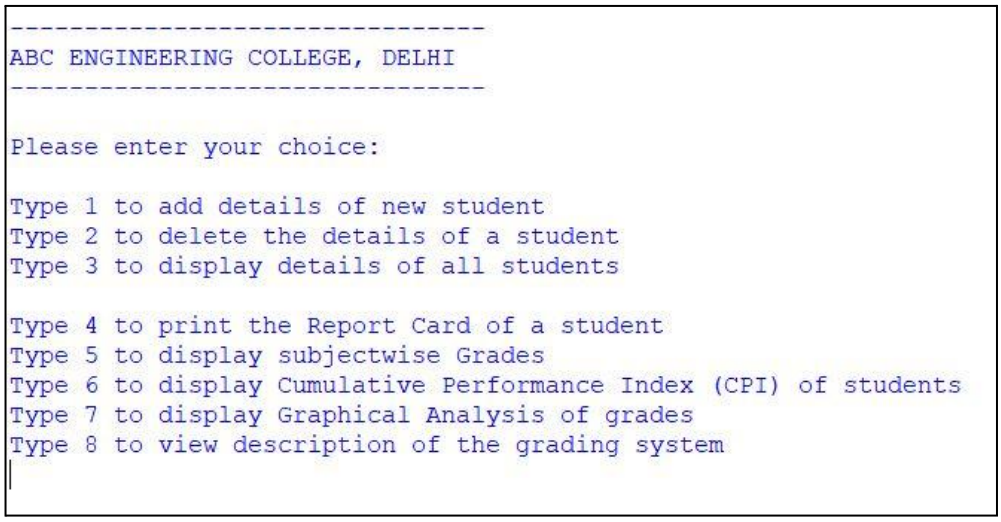
1. Microprocessor: Intel Core i5 CPU
2. Memory: 8 GB
3. Virtual Memory: 64-bit
4. Hard Disk: 1 TB

Software Specifications:

1. Operating System: Windows 10
2. Front-End Design: Python 3
3. Back-End Design: MySQL
4. Documentation: Microsoft Word

INPUT FORMS

- The opening screen of the project is as shown:



The user needs to select the option as per their requirement.

- If the user wants to enter the data of a new student, they can select option 1, the program will ask them to enter the necessary details and also show errors if invalid data is entered(or data of the roll number entered already exists), as shown:

```
--------------------------------
ABC ENGINEERING COLLEGE, DELHI
--------------------------------

Please enter your choice:

Type 1 to add details of new student
Type 2 to delete the details of a student
Type 3 to display details of all students

Type 4 to print the Report Card of a student
Type 5 to display subjectwise Grades
Type 6 to display Cumulative Performance Index (CPI) of students
Type 7 to display Graphical Analysis of grades
Type 8 to view description of the grading system
1
5-digit Roll Number: 10992
Name:Suhani Jain
Enrollment no: 20198877
Gender(M/F): F
DOB(yyyy-mm-dd format): 2002-12-10
Contact Number: 9987022567
ESC01 Grade: A
MTH01 Grade: B
PHY01 Grade: A
TA01 Grade: A
PE garde(P/F): P
Data Entered Successfully
>>>
```

```
Type 7 to display Graphical Analysis of grades
Type 8 to view description of the grading system
1
5-digit Roll Number: 12
Invalid Input
>>>
```

```
Type 7 to display Graphical Analysis of grades
Type 8 to view description of the grading system
1
5-digit Roll Number: 10992
Data Already exists:
   Roll No         Name  Enrollment No Gender Date Of Birth Contact Number
0    10992  Suhani Jain       20198877      F    2002-12-10     9987022567
>>>
```

- If the user wants to delete the data of an existing they can select option 2, the program will ask the roll number of the student whose data is to be deleted. The program also shows an error if the roll number entered doesn't exist in the database as follows:

```
---------------------------------
ABC ENGINEERING COLLEGE, DELHI
---------------------------------

Please enter your choice:

Type 1 to add details of new student
Type 2 to delete the details of a student
Type 3 to display details of all students

Type 4 to print the Report Card of a student
Type 5 to display subjectwise Grades
Type 6 to display Cumulative Performance Index (CPI) of students
Type 7 to display Graphical Analysis of grades
Type 8 to view description of the grading system
2
Enter roll number of the student whose data is to be deleted: 10967
Data deleted successfully
>>>
```

```
--------------------------------
ABC ENGINEERING COLLEGE, DELHI
--------------------------------

Please enter your choice:

Type 1 to add details of new student
Type 2 to delete the details of a student
Type 3 to display details of all students

Type 4 to print the Report Card of a student
Type 5 to display subjectwise Grades
Type 6 to display Cumulative Performance Index (CPI) of students
Type 7 to display Graphical Analysis of grades
Type 8 to view description of the grading system
2
Enter roll number of the student whose data is to be deleted: 10999
Data not found!
>>>
```

- If the user wants to see the details of all the students enrolled, they can choose option 3 as follows:

```
--------------------------------
ABC ENGINEERING COLLEGE, DELHI
--------------------------------

Please enter your choice:

Type 1 to add details of new student
Type 2 to delete the details of a student
Type 3 to display details of all students

Type 4 to print the Report Card of a student
Type 5 to display subjectwise Grades
Type 6 to display Cumulative Performance Index (CPI) of students
Type 7 to display Graphical Analysis of grades
Type 8 to view description of the grading system
3
   Roll No          Name  Enrollment No Gender Date Of Birth Contact Number
0    10958   Aarya Gupta       20195495      F    2001-09-25     9658741234
1    10959   Dhruv Sethi       20195496      M    2001-12-12     9741256983
2    10960  Ishaan Yadav       20195497      M    2001-10-28     7456321789
3    10961  Manan Sharma       20195498      M    2001-01-21     9612389654
4    10962  Pulkit Arora       20195499      M    2001-02-17     9741253691
5    10963   Riddhi Vyas       20195500      F    2001-04-07     8749321654
6    10964     Riya Jain       20195501      F    2001-07-18     9998563214
7    10965  Sakshi Gupta       20195502      F    2001-09-22     9741236587
8    10992   Suhani Jain       20198877      F    2002-12-10     9987022567
>>>
```

- If the user wants to print the report card of a student they can select option 4, and enter the roll number of the respective student, the program shows an error if the roll number entered is invalid:

```
--------------------------------
ABC ENGINEERING COLLEGE, DELHI
--------------------------------

Please enter your choice:

Type 1 to add details of new student
Type 2 to delete the details of a student
Type 3 to display details of all students

Type 4 to print the Report Card of a student
Type 5 to display subjectwise Grades
Type 6 to display Cumulative Performance Index (CPI) of students
Type 7 to display Graphical Analysis of grades
Type 8 to view description of the grading system
4
Type the Roll Number to see display report card
10992

-----------------------------
Roll No:  10992

Name:  Suhani Jain

Enrollment Number:  20198877
-----------------------------

ESC01 MTH01 PHY01 TA01 PE01
   A     B     A    A    P

---------------------------------------------
Cumulative Performance Index(CPI) =  9.4585
---------------------------------------------
```

```
Type the Roll Number to see display report card
12
No data found for the entered Roll No
```

- If the user wants to see subject-wise grades they can select option 5, the program asks the user the subject whose grades they wish to see, they can enter their choice accordingly:

```
--------------------------------
ABC ENGINEERING COLLEGE, DELHI
--------------------------------

Please enter your choice:

Type 1 to add details of new student
Type 2 to delete the details of a student
Type 3 to display details of all students

Type 4 to print the Report Card of a student
Type 5 to display subjectwise Grades
Type 6 to display Cumulative Performance Index (CPI) of students
Type 7 to display Graphical Analysis of grades
Type 8 to view description of the grading system
5
Type 0 to see grades of all students in all subjects
Type 1 to see ESC01 Grades
Type 2 to see MTH01 Grades
Type 3 to see PHY01 Grades
Type 4 to see TA01 Grades
Type 5 to see PE01 Grades
2
The grades of students in Mathematics(MTH01) are as follows:

   Roll No Grade
0    10958     B
1    10959     C
2    10960     C
3    10961     B
4    10962     A
5    10963     C
6    10964     B
7    10965     A
8    10992     B
>>>
```

- If the user wants to see CPI(Cumulative Performance Index) of an individual/all students, they can select option 6, the program will ask the user whether they want to see individual data or of all students, the user can choose accordingly and enter the roll number of the respective student(if they chose individual data earlier). The program also shows errors accordingly:

```
--------------------------------
ABC ENGINEERING COLLEGE, DELHI
--------------------------------

Please enter your choice:

Type 1 to add details of new student
Type 2 to delete the details of a student
Type 3 to display details of all students

Type 4 to print the Report Card of a student
Type 5 to display subjectwise Grades
Type 6 to display Cumulative Performance Index (CPI) of students
Type 7 to display Graphical Analysis of grades
Type 8 to view description of the grading system
6
Type 0 to see CPI of all students
Type the Roll Number to see CPI of that student
10992
Roll No. 10992 Suhani Jain has CPI = 9.4585
>>>
```

```
Type 0 to see CPI of all students
Type the Roll Number to see CPI of that student
234
No data found for the entered Roll Number

>>>
```

- If the user wants to see graphs for grades analysis, they can choose option 6, the program will show another input screen for the user to enter what they want to see:

```
--------------------------------
ABC ENGINEERING COLLEGE, DELHI
--------------------------------

Please enter your choice:

Type 1 to add details of new student
Type 2 to delete the details of a student
Type 3 to display details of all students

Type 4 to print the Report Card of a student
Type 5 to display subjectwise Grades
Type 6 to display Cumulative Performance Index (CPI) of students
Type 7 to display Graphical Analysis of grades
Type 8 to view description of the grading system
7
Type 1 for ESC01 Bar Chart
Type 2 for MTH01 Bar Chart
Type 3 for PHY01 Bar Chart
Type 4 for TA01 Bar Chart
Type 5 for AVERAGE GRADEPOINTS Line Chart
4
```

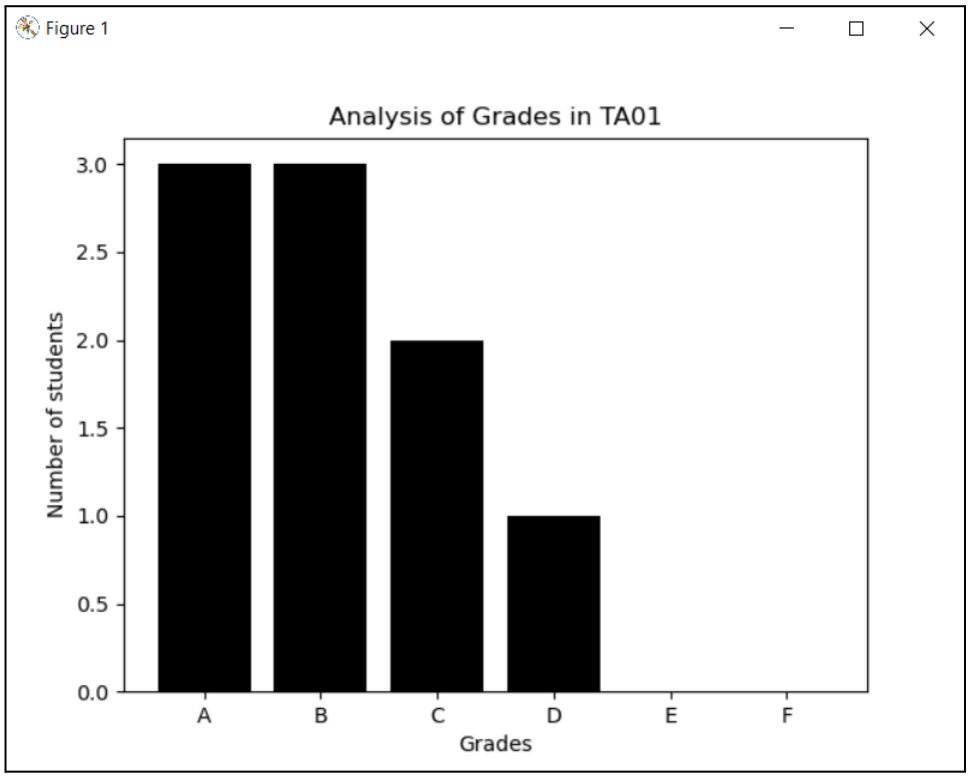


Figure 1
Analysis of Grades in TA01
Number of students
3.0
2.5
2.0
1.5
1.0
0.5
0.0
A
B
C
D
E
F
Grades

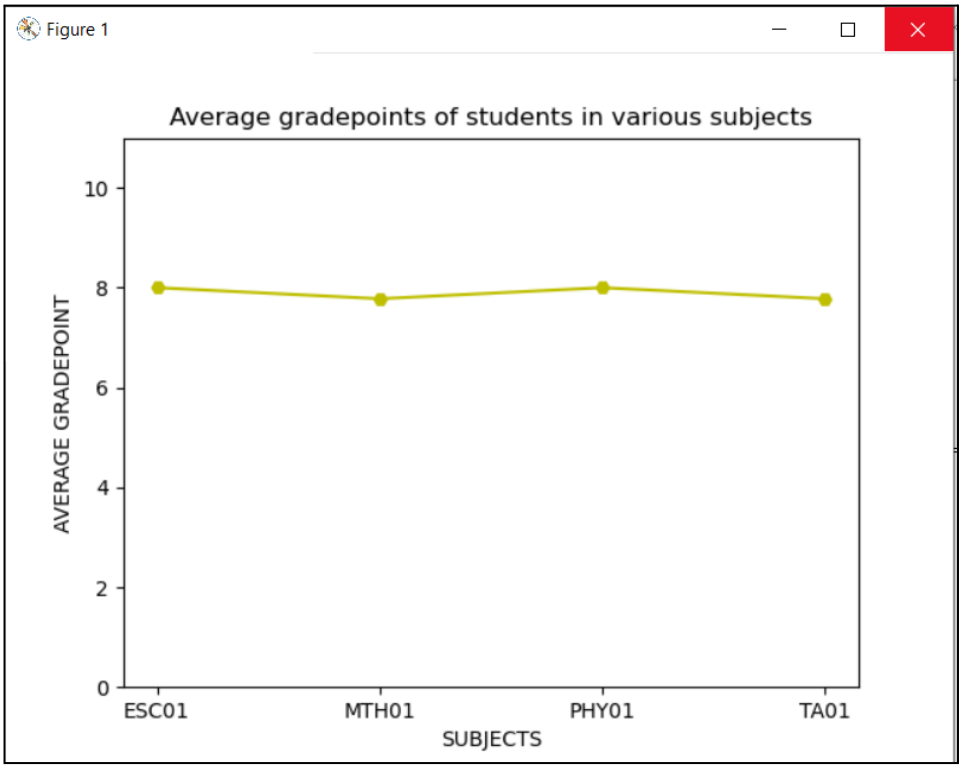


Figure 1
Average gradepoints of students in various subjects
AVERAGE GRADEPOINT
10
8
6
4
2
0
ESC01
MTH01
PHY01
TA01
SUBJECTS

- If the user wants to know about the grading system of the college, they can choose option 8:

```
--------------------------------
ABC ENGINEERING COLLEGE, DELHI
--------------------------------

Please enter your choice:

Type 1 to add details of new student
Type 2 to delete the details of a student
Type 3 to display details of all students

Type 4 to print the Report Card of a student
Type 5 to display subjectwise Grades
Type 6 to display Cumulative Performance Index (CPI) of students
Type 7 to display Graphical Analysis of grades
Type 8 to view description of the grading system
8
```

```
8

ABC ENGINEERING COLLEGE GRADING SYSTEM

DESCRIPTION OF GRADES:
There are six letter grades: A, B, C, D, E and F.In some courses such as projects, physical education etc.
Satisfactory (P) / Unsatisfactory (F) grade is awarded. Grade 'F' implies that the student has failed the course.
P/F grades are not used for the calculation of CPI.
The letter grades, their descriptions, and their Grade Points are as follows:

  Grade  Grade Points  Description
0     A            10  Outstanding
1     B             8    Excellent
2     C             6         Good
3     D             4         Fair
4     E             2         Pass
5     F             0         Fail

COURSES OFFERED:
The courses offered and their respective credits are as follows:

                  Course Name Course Code  Credits
0  Introduction To Programming       ESC01      124
1                  Mathematics       MTH01       88
2                      Physics       PHY01       88
3              Technical Arts        TA01       25
4           Physical Education        PE01       25


CUMULATIVE PERFORMANCE INDEX:
The Cumulative Performance Index (CPI) is the average of the grade points earned by a student in all the courses:-

CPI = (C1*G1+ C2*G2+ C3*G3+ . . . + Cn*Gn)/(C1+ C2+ C3+ . . . + Cn)

where n is the number of courses registered during the semester,
Ci is the number of credits allotted to a particular course,
and Gi is the grade points to the grade awarded for the course.

>>>
```

SOURCE CODE OF THE PROJECT

Importing modules:

```
import mysql.connector
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
```

Creating database and tables:

```
curr = mysql.connector.connect (user="root",passwd="",
host="localhost")

myc = curr.cursor()
myc.execute("create database college_result")
myc.execute("use college_result")

myc.execute("create table students(roll_no int(5) not null,name
varchar(25) not null,enroll_no int (7),gender varchar(2), DOB date,
contact_no decimal(10),primary key(roll_no))")

myc.execute("create table phy01(roll_no int(5) not null,grade
varchar(2),gradep int,credits int (3) DEFAULT 88,foreign
key(roll_no) references students(roll_no)ON DELETE CASCADE)")
```

```
myc.execute("create table mth01(roll_no int(5) not null,grade
varchar(2),gradep int,credits int (3)DEFAULT 88,foreign key(roll_no)
references students(roll_no)ON DELETE CASCADE)")
myc.execute("create table pe01 (roll_no int(5) not null,grade
varchar(2),credits int (3) DEFAULT 25,foreign key(roll_no)
references students(roll_no)ON DELETE CASCADE)")

myc.execute("create table esc01(roll_no int(5) not null,grade
varchar(2),gradep int,credits int (3) DEFAULT 124,foreign
key(roll_no) references students(roll_no)ON DELETE CASCADE)")

myc.execute("create table ta01 (roll_no int(5) not null,grade
varchar(2),gradep int,credits int (3) DEFAULT 25,foreign
key(roll_no) references students(roll_no)ON DELETE CASCADE)")

myc.execute("create table grades AS select students.roll_no as
roll_no, students.name as name,esc01.grade as esc01, mth01.grade as
mth01, phy01.grade as phy01, ta01.grade as ta01,  pe01.grade as pe01
from students INNER JOIN mth01 on students.roll_no =
mth01.roll_no INNER JOIN phy01 ON mth01.roll_no =
phy01.roll_no INNER JOIN ta01 ON phy01.roll_no = ta01.roll_no
INNER JOIN esc01 ON ta01.roll_no = esc01.roll_no INNER JOIN
pe01 ON esc01.roll_no = pe01.roll_no")

myc.execute("create table gradepoints AS select students.roll_no as
roll_no,students.name as name,esc01.gradep as esc01g, mth01.gradep
as mth01g, phy01.gradep as phy01g, ta01.gradep as ta01g from
students INNER JOIN mth01 on students.roll_no = mth01.roll_no
INNER JOIN phy01 ON mth01.roll_no = phy01.roll_no INNER
JOIN ta01 ON phy01.roll_no = ta01.roll_no INNER JOIN esc01 ON
ta01.roll_no = esc01.roll_no ")
```

```
myc.execute("create table cpi AS select roll_no, name, (ta01g*25 +
esc01g*124 + mth01g*88 + phy01g*88) /325 as cpi from
gradepoints")

myc.close()
curr.close()
```

Defining the user-interface:

```
def show_data(choice):
curr = mysql.connector.connect (user="root", passwd="",
host="localhost",  database="college_result")
    myc = curr.cursor()
    myc.execute("select roll_no from students")
    stu=myc.fetchall()
    rolllist=[list(i) for i in stu]
```

Choice 1 (To enter details of new student)

```
    if choice == "1":
        dic={"A":10,"B":8,"C":6,"D":4,"E":2}
        roll = int(input("5-digit Roll Number: "))
        if [roll] in rolllist:
            myc.execute("select * from students where roll_no= "
+str(roll))
            s=pd.DataFrame(myc.fetchall(),columns=['Roll
No','Name','Enrollment No','Gender','Date Of Birth','Contact
Number'])
            print("Data Already exists:")
```

```
        print(s)

    elif roll < 10000 or roll > 99999:
        print("Invalid Input")

    else:
        name = input("Name:")
        enroll_no = int(input("Enrollment no: "))
        gender = input("Gender(M/F): ")
        dob = input("DOB(yyyy-mm-dd format): ")
        contact = input("Contact Number: ")

        escgrade = input("ESC01 Grade: ")
        mthgrade = input("MTH01 Grade: ")
        phygrade= input("PHY01 Grade: ")
        tagrade = input("TA01 Grade: ")
        pegrade = input("PE garde(P/F): ")
        escgp = dic[escgrade]
        mthgp = dic[mthgrade]
        phygp = dic[phygrade]
        tagp = dic[phygrade]
```

```
        myc.execute("""insert into students
values(%s,%s,%s,%s,%s,%s)""",(roll,name,enroll_no,gender,dob,cont
act))

        myc.execute("""insert into esc01(roll_no,grade,gradep)
values(%s,%s,%s)""",(roll,escgrade,escgp))

        myc.execute("""insert into mth01(roll_no,grade,gradep)
values(%s,%s,%s)""",(roll,mthgrade,mthgp))

        myc.execute("""insert into phy01(roll_no,grade,gradep)
values(%s,%s,%s)""",(roll,phygrade,phygp))

        myc.execute("""insert into ta01(roll_no,grade,gradep)
values(%s,%s,%s)""",(roll,tagrade,tagp))

        myc.execute("""insert into pe01(roll_no,grade)
values(%s,%s)""",(roll,pegrade))

        myc.execute("""insert into grades
values(%s,%s,%s,%s,%s,%s,%s)""",(roll,name,escgrade,mthgrade,ph
ygrade,tagrade,pegrade))

        myc.execute("""insert into gradepoints
values(%s,%s,%s,%s,%s,%s)""",(roll,name,escgp,mthgp,phygp,tagp))

        myc.execute("""insert into cpi
values(%s,%s,%s)""",(roll,name,(tagp*25 + escgp*124 + mthgp*88 +
phygp*88) /325))


        curr.commit()

        myc.close()

        print("Data Entered Successfully")
```

Choice 2(To delete data of a student) :

```
    elif choice == "2":
        rno = int(input("Enter roll number of the student whose data is to
be deleted: "))
        if[rno] in rolllist:
            comm = "delete from students where roll_no =" + str(rno)
            myc.execute(comm)
            comm2 = "delete from grades where roll_no =" + str(rno)
            myc.execute(comm2)
            comm3 = "delete from gradepoints where roll_no =" + str(rno)
            myc.execute(comm3)
            comm4 = "delete from cpi where roll_no =" + str(rno)
            myc.execute(comm4)

            curr.commit()
            myc.close()
            print("Data deleted successfully")
        else:
            print("Data not found!")
```

Choice 3(To display details of all students)

```
    elif choice == "3":
        comm= "select * from students"
        myc.execute(comm)
```

```
        students=pd.DataFrame(myc.fetchall(), columns=['Roll No',
'Name', 'Enrollment No','Gender','Date Of Birth','Contact Number'])
        print(students)
```

Choice 4(To display report card)

```
    elif choice == "4":
        next_choice = int(input("Type the Roll Number to print report
card\n"))

        if [next_choice] in rolllist:
            comm = "select students.roll_no, students.name,
students.enroll_no, esc01.grade, mth01.grade, phy01.grade,
ta01.grade, pe01.grade, cpi.cpi from students INNER JOIN mth01
ON students.roll_no = mth01.roll_no INNER JOIN phy01 ON
mth01.roll_no = phy01.roll_no INNER JOIN ta01 ON phy01.roll_no
= ta01.roll_no INNER JOIN esc01 ON ta01.roll_no = esc01.roll_no
INNER JOIN pe01 on esc01.roll_no = pe01.roll_no INNER JOIN cpi
ON pe01.roll_no=cpi.roll_no where students.roll_no= "
+str(next_choice)
            myc.execute(comm)
            report= pd.DataFrame(myc.fetchall(), columns=['ROLL
NO','NAME','ENROLLMENT NO', 'ESC01', 'MTH01', 'PHY01',
'TA01', 'PE01', 'CPI'])
            print(" ")
            print("----------------------------")
            print("Roll No:" +report['ROLL NO'].to_string (index=False))
            print(" ")
```

```
            print("Name: " +report['NAME'].to_string(index=False))
            print(" ")
            print("Enrollment Number: "+ report['ENROLLMENT
NO'].to_string(index=False))
            print("-----------------------------")
            print(" ")

print(report[['ESC01','MTH01','PHY01','TA01','PE01']].to_string(inde
x=False))
            print(" ")
            print("-------------------------------------------")
            print("Cumulative Performance Index(CPI) = "+
report['CPI'].to_string(index=False))
            print("-------------------------------------------")
            print(" ")
        else:
            print("No data found for the entered Roll No\n")
```

Choice 5(To display all or subject-wise grades)

```
    elif choice == "5":
        next_choice = input("Type 0 to see grades of all subjects\n"
                            "Type 1 to see ESC01 Grades\n"
                            "Type 2 to see MTH01 Grades\n"
                            "Type 3 to see PHY01 Grades\n"
```

```
                "Type 4 to see TA01 Grades\n"
                "Type 5 to see PE01 Grades\n")

    if next_choice == "0":
        comm = "select * from grades"
        myc.execute(comm)
        grades_all = pd.DataFrame(myc.fetchall(),columns=['roll_no',
'name', 'mth01', 'phy01', 'ta01', 'esc01', 'pe01'])
        print(grades_all)

    elif next_choice == "1":
        comm1 = "select roll_no, grade from esc01"
        myc.execute(comm1)
        esc = pd.DataFrame(myc.fetchall(),columns= ['Roll No',
'Grade'])
        print(esc)

    elif next_choice == "2":
         myc.execute("select roll_no, grade from mth01")
         mth=pd.DataFrame(myc.fetchall(),columns=["Roll No",
"Grade"])
         print(mth)

    elif next_choice == "3":
```

```
            myc.execute("select roll_no, grade from phy01")
            phy=pd.DataFrame(myc.fetchall(),columns=["Roll No",
"Grade"])
            print(phy)


        elif next_choice == "4":
            myc.execute("select roll_no, grade from ta01")
            ta=pd.DataFrame(myc.fetchall(),columns=["Roll
No","Grade"])
            print(ta)


        elif next_choice == "5":
            myc.execute("select roll_no, grade from pe01")
            pe=pd.DataFrame(myc.fetchall(),columns=["Roll
No","Grade"])
            print(pe)
```

Choice 6(To display CPI of all students or a particular student)

```
    elif choice == "6":


        next_choice = int(input("Type 0 to see CPI of all students\n"
                                "Type the Roll Number to see CPI of that
student\n"))
```

```
        if next_choice == 0:
            comm = "select * from cpi"
            myc.execute(comm)
            cpi_all = pd.DataFrame(myc.fetchall(), columns=['roll_no',
'name', 'cpi'])
            print(cpi_all)


        elif [next_choice] in rolllist:
            comm = "select * from cpi where roll_no= "+ str(next_choice)
            myc.execute(comm)
            cpi_indiv = pd.DataFrame(myc.fetchall(), columns=['roll_no',
'name', 'cpi'])
            print("Roll No. {} {} has CPI = {}".format(next_choice,
cpi_indiv.loc[0,'name'] , cpi_indiv.loc[0,'cpi']))


        else:
            print("No data found for the entered Roll Number\n")
```

Choice 7 (To display bar charts)

```
    elif choice == "7":
        next_choice = input("Type 1 for ESC01 Bar Chart\n"
                            "Type 2 for MTH01 Bar Chart\n"
                            "Type 3 for PHY01 Bar Chart\n"
```

```
                    "Type 4 for TA01 Bar Chart\n"
                    "Type 5 for Average Gradepoints Line Chart\n")
    x=np.arange(6)
    g=['A','B','C','D','E','F']

    if next_choice == "1":
        comm4 = "select grade from esc01"
        myc.execute(comm4)
        p = [i[0] for i in myc.fetchall()]
        gl=[p.count('A'),p.count('B'),p.count('C'),p.count('D'),
p.count('E'), p.count('F')]
        plt.bar(x,gl,color='c')
        plt.xticks(x,g)
        plt.xlabel('Grades')
        plt.ylabel('Number of students')
        plt.title('Analysis of Grades in ESC01')
        plt.show()

    elif next_choice == "2":
        comm5 = "select grade from mth01"
        myc.execute(comm5)
        p = [i[0] for i in myc.fetchall()]
        gl=[p.count('A'),p.count('B'),p.count('C'),p.count('D'),
p.count('E'),p.count('F')]
```

```
            plt.bar(x,gl,color='k')
            plt.xticks(x,g)
            plt.xlabel('Grades')
            plt.ylabel('Number of students')
            plt.title('Analysis of Grades in MTH01')
            plt.show()

        elif next_choice == "3":
            comm6 = "select grade from phy01"
            myc.execute(comm6)
            p = [i[0] for i in myc.fetchall()]
            gl=[p.count('A'),p.count('B'),p.count('C'),p.count('D'),
p.count('E'),p.count('F')]
            plt.bar(x,gl,color='r')
            plt.xticks(x,g)
            plt.xlabel('Grades')
            plt.ylabel('Number of students')
            plt.title('Analysis of Grades in PHY01')
            plt.show()

        elif next_choice == "4":
            comm7 = "select grade from ta01"
            myc.execute(comm7)
            p = [i[0] for i in myc.fetchall()]
```

```
        gl=[p.count('A'),p.count('B'),p.count('C'),p.count('D'),
p.count('E'),p.count('F')]
        plt.bar(x,gl,color='k')
        plt.xticks(x,g)
        plt.xlabel('Grades')
        plt.ylabel('Number of students')
        plt.title('Analysis of Grades in TA01')
        plt.show()


    elif next_choice =="5":
        comm3= "select avg(esc01g), avg(mth01g) , avg(phy01g),
avg(ta01g) from gradepoints"
        myc.execute(comm3)
        avg_gradepoints = pd.DataFrame(myc.fetchall())
        avg = avg_gradepoints.iloc[0]
        col = ['ESC01','MTH01','PHY01','TA01']
        plt.plot(col,avg,color='y',marker='H')
        plt.ylim(0,11)
        plt.ylabel('AVERAGE GRADEPOINT')
        plt.xlabel('SUBJECTS')
        plt.title('Average gradepoints of students in various subjects')
        plt.show()
    else:
        print("INVALID INPUT\n")
```

Choice 8 (To display information regarding grading system of the college)

```
    elif choice == "8":
        co = pd.read_csv("C:\\Users\\Vinod Gopalani\\Desktop\\
courses. csv" )
        gr=pd.read_csv("C:\\Users\\Vinod Gopalani\\Desktop\\
grades.csv")
        print("\n"
    "ABC ENGINEERING COLLEGE GRADING SYSTEM\n"
    " \n"
    "DESCRIPTION OF GRADES:\n"
    "There are six letter grades: A, B, C, D, E and F.In some courses
such as projects, seminars, physical education etc. Satisfactory (P) / U
nsatisfactory (F) grade is awarded. Grade 'F' implies that the student
has failed the course. P/F grades are not used for the calculation of CP
I. The letter grades, their descriptions, and the numerical equivalents o
n a 10-point scale (called Grade Points) are as follows:\n")
    print(gr)
    print(" \n"
    "COURSES OFFERED:\n"
    "The courses offered and their credits are as follows:\n")
    print(co)
    print(" \n")
    print("CUMULATIVE PERFORMANCE INDEX:\n"
```

"The Cumulative Performance Index (CPI) is the average of the grade points earned by a student in all the courses of the semester:-\n"

" \n"

"CPI = (C1*G1+ C2*G2+ C3*G3+ . . . + Cn*Gn)/(C1+ C2+ C3 + . . . + Cn)\n"

" \n"

"where, n is the number of courses registered during the semester , Ci is the number of credits allotted to a particular course, and Gi is th e grade points corresponding to the grade awarded for the course.\n")

MAIN SCREEN:

```
if __name__=="__main__":

    choice = input("                              \n"
                   "------------------------------\n"
                   "ABC ENGINEERING COLLEGE, DELHI\n"
                   "------------------------------\n"
                   "                              \n"
                   "Please enter your choice:\n"
                   "                          \n"
                   "Type 1 to add details of new student\n"
                   "Type 2 to delete the details of a student\n"
                   "Type 3 to display details of all students\n"
                   "\n"
                   "Type 4 to print the Report Card of a student\n"
                   "Type 5 to display subject-wise Grades\n"
                   "Type 6 to display Cumulative Performance Index (CPI)
of students\n"
                   "Type 7 to display Bar Graphs for grades analysis\n"
                   "Type 8 to view description of the grading system\n")

    show_data(choice)
```

DATA DICTIONARY

- Various tables used in this project are:

```
mysql> USE college_result;

mysql> DESC students;

+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| roll_no    | int          | NO   | PRI | NULL    |       |
| name       | varchar(25)  | NO   |     | NULL    |       |
| enroll_no  | int          | YES  |     | NULL    |       |
| gender     | varchar(2)   | YES  |     | NULL    |       |
| DOB        | date         | YES  |     | NULL    |       |
| contact_no | decimal(10,0) | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+


mysql> DESC esc01;

+---------+-----------+------+-----+---------+-------+
| Field   | Type      | Null | Key | Default | Extra |
+---------+-----------+------+-----+---------+-------+
| roll_no | int       | NO   | MUL | NULL    |       |
| grade   | varchar(2) | YES  |     | NULL    |       |
| gradep  | int       | YES  |     | NULL    |       |
| credits | int       | YES  |     | 124     |       |
+---------+-----------+------+-----+---------+-------+

mysql> DESC mth01;

+---------+-----------+------+-----+---------+-------+
| Field   | Type      | Null | Key | Default | Extra |
+---------+-----------+------+-----+---------+-------+
| roll_no | int       | NO   | MUL | NULL    |       |
| grade   | varchar(2) | YES  |     | NULL    |       |
```

```
| gradep  | int         | YES  |     | NULL    |       |
| credits | int         | YES  |     | 88      |       |
+---------+-------------+------+-----+---------+-------+


mysql> DESC phy01;

+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| roll_no | int         | NO   | MUL | NULL    |       |
| grade   | varchar(2)  | YES  |     | NULL    |       |
| gradep  | int         | YES  |     | NULL    |       |
| credits | int         | YES  |     | 88      |       |
+---------+-------------+------+-----+---------+-------+

mysql> DESC ta01;

+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| roll_no | int         | NO   | MUL | NULL    |       |
| grade   | varchar(2)  | YES  |     | NULL    |       |
| gradep  | int         | YES  |     | NULL    |       |
| credits | int         | YES  |     | 25      |       |
+---------+-------------+------+-----+---------+-------+

mysql> DESC pe01;

+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| roll_no | int         | NO   | MUL | NULL    |       |
| grade   | varchar(2)  | YES  |     | NULL    |       |
| credits | int         | YES  |     | 25      |       |
+---------+-------------+------+-----+---------+-------+

mysql> DESC grades;

+---------+-------------+------+-----+---------+-------+
| Field   | Type         | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| roll_no | int          | NO   |     | NULL    |       |
```

```
| name    | varchar(25) | NO   |     | NULL    |       |
| esc01   | varchar(2)  | YES  |     | NULL    |       |
| mth01   | varchar(2)  | YES  |     | NULL    |       |
| phy01   | varchar(2)  | YES  |     | NULL    |       |
| ta01    | varchar(2)  | YES  |     | NULL    |       |
| pe01    | varchar(2)  | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
```

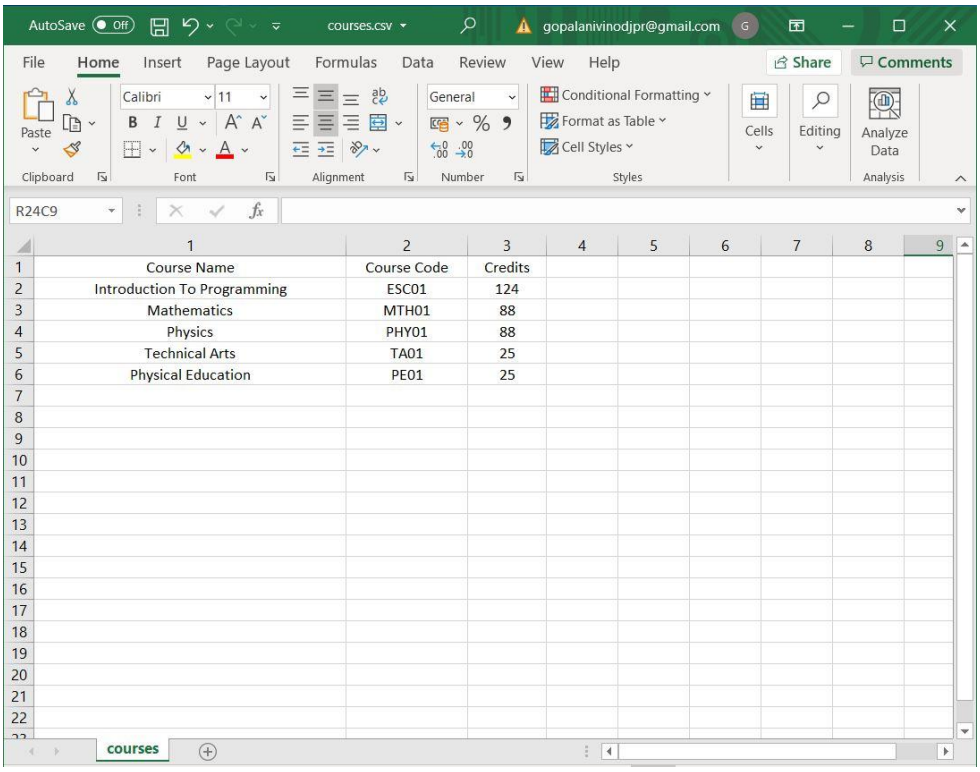
```
mysql> DESC gradepoints;

+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| roll_no | int         | NO   |     | NULL    |       |
| name    | varchar(25) | NO   |     | NULL    |       |
| esc01g  | int         | YES  |     | NULL    |       |
| mth01g  | int         | YES  |     | NULL    |       |
| phy01g  | int         | YES  |     | NULL    |       |
| ta01g   | int         | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
```

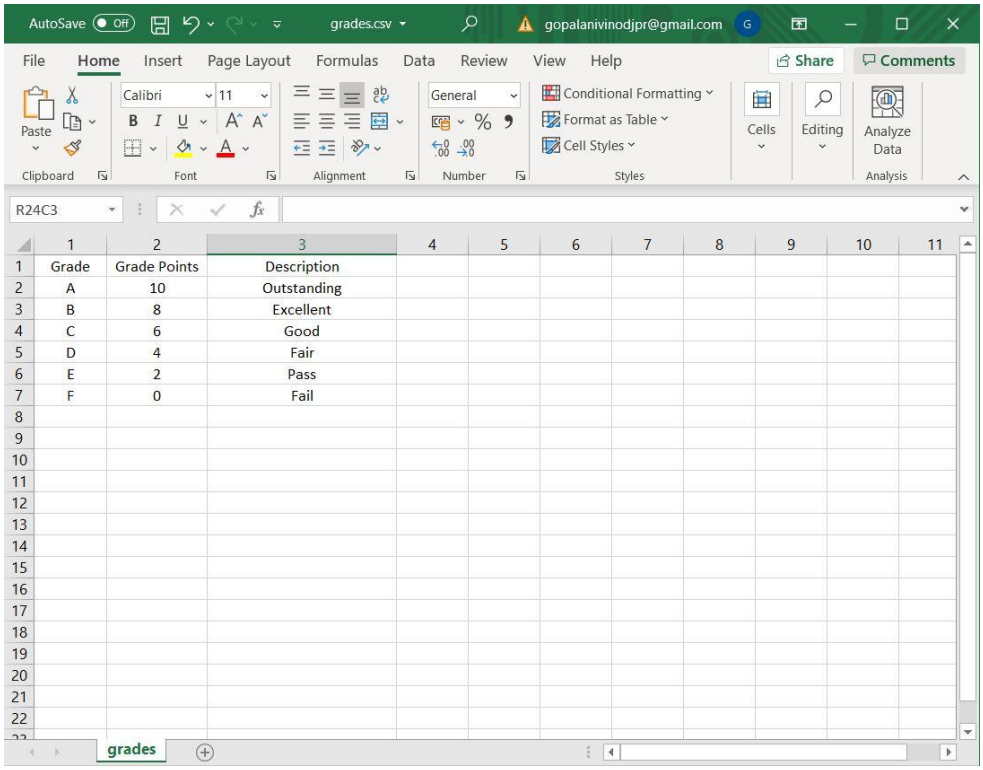
```
mysql> DESC cpi;

+---------+---------------+------+-----+---------+-------+
| Field   | Type          | Null | Key | Default | Extra |
+---------+---------------+------+-----+---------+-------+
| roll_no | int           | NO   |     | NULL    |       |
| name    | varchar(25)   | NO   |     | NULL    |       |
| cpi     | decimal(20,4) | YES  |     | NULL    |       |
+---------+---------------+------+-----+---------+-------+
```

- CSV Files used are:



	1	2	3	4	5	6	7	8	9
1	Course Name	Course Code	Credits						
2	Introduction To Programming	ESC01	124						
3	Mathematics	MTH01	88						
4	Physics	PHY01	88						
5	Technical Arts	TA01	25						
6	Physical Education	PE01	25						
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									



	1	2	3	4	5	6	7	8	9	10	11
1	Grade	Grade Points	Description								
2	A	10	Outstanding								
3	B	8	Excellent								
4	C	6	Good								
5	D	4	Fair								
6	E	2	Pass								
7	F	0	Fail								
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											

grades