Recall the data structure that you designed last week for storing grades of lab groups. In this example class, we are about to develop a grading system consisting of the following functionalities:

* Input individual grades, e.g., the grade of student no. 1 in FE1 is 90.
* Query the grade of a student in a lab group
* List all the grades in a lab group
* Get the highest grade in a lab group

**Discussion 1**

Develop a Python function inputRecord(dataBase, group, id, score) for TAs to enter one record, where dataBase is the database implemented by your data structure, group is a string representing a group name, id is a student’s id number (positive integers ranging from 1 to 40), and score is the grade of the student.

Input the group, id and score

groups=[]  
  
NumberOfGroups = int(input("Enter number of groups: "))  
print("The groups are ",end="")  
for i in range(1,NumberOfGroups+1):  
 i = str(i)  
 a = "FE" + i  
 groups.append(a)  
print(groups)  
  
Data = []  
NumberOfStudents = 40  
  
while len(Data)<2: #NumberOfStudents:  
 Group = input("Enter a group(FE2 etc): ")  
 if Group not in groups:  
 print("Enter FE1,FE2 etc.")  
 continue

ID = input("Enter an ID no.(1-40): ")  
 ID = int(ID)  
 if ID<1 or ID>40:  
 print("Enter a number between 1-40!!!")  
 continue  
  
 Score = input("Enter a score: ")  
 Score = int(Score)  
 if Score<1 or Score>100 :  
 print("Enter a number between 1-100!!!")  
 continue  
  
 ID = str(ID)  
 Score = str(Score)  
 Student = [Group,ID,Score]  
 Data.append(Student)  
 #print(len(Data))  
  
print(Data)

This attempt did not use any functions and id can be repeated

Def insertrecord(database,group,id,score):

Datakey = [group,id]

Database[datakey] = score

**Discussion 2**

Develop a Python function query(dataBase, group, id) for TAs to get the score of a student in a lab group, where dataBase is the database implemented by your data structure, group is a string representing a group name, and id is the student’s id. This function should return the score.

Input the group and id, getting the score

Grp = input("Enter a group: ")

Identity = input("Enter an ID no.(1-40): ")

for i in Data:  
 if i[0] == Grp and i[1] == Identity :  
 print(i[2])

def query(database,group,id):

try:

key = (group,id)

return database[key]

except Keyerror:

return None

**Discussion 3**

Develop a Python function listGrades(dataBase, group) for TAs to get all the student grades in a group, where dataBase is the database implemented by your data structure and group is a string representing a group name. This function should return a list of grades in the group.

Input group, get all student grades in group(list)

Grp = input("Enter a group: ")

abc = []  
  
for i in Data:  
 if i[0] == Grp:  
 abc.append(i[2])  
print(abc)

**def listgrades(database,group):**

**listofscores = []**

**for key,value in database.items():**

**if key[0] ==group:**

**listofscores.append(value)**

**return listofscores**

**Discussion 4**

Develop a Python function maxGrade(dataBase, group) for TAs to get the highest grade in a group, where dataBase is the database implemented by your data structure and group is a string representing a group name. This function should return the highest grade.

Input group, get the highest score in the group, continue from discussion 3

while len(abc)!=1:  
 if abc[len(abc)-1] <= abc[len(abc)-2]:  
 abc.pop()  
 else:  
 abc.remove(abc[len(abc)-2])  
print(abc)

def maxgrade(database,group):

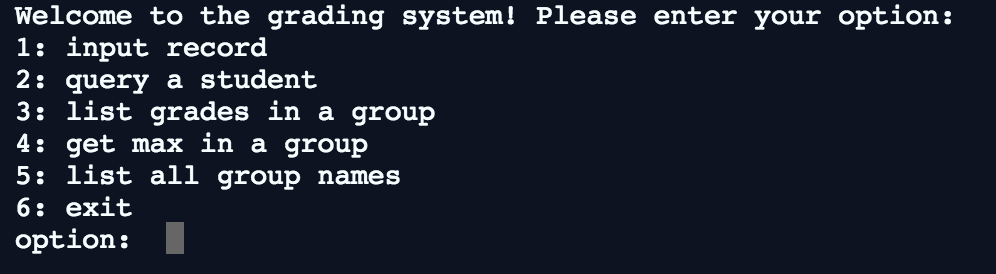
scores = listgrades(database,group)

return max(scores)

**Discussion 5 (Optional)**

Develop the main program to show the options to users, get the option, and invoke the corresponding functions developed.

For example, show the available options and get the option from users:



Print(“Welcome…exit”)

Int(input(“option: “)

If option == \_\_:

1:input record->discussion 1

2:query->discussion 2

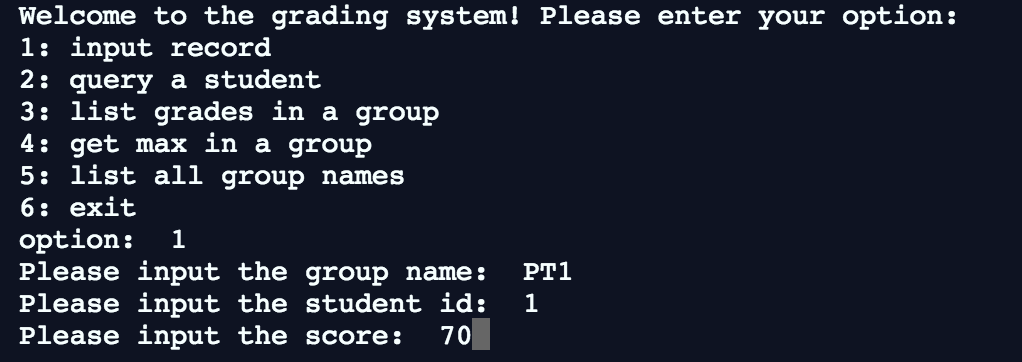
3:list grades ->discussion 3

4:get max->discussion 4

5:list all group names->print(groups)

6:exit->quit()

For example, invoke the corresponding function:



Def read\_data():

Groupname = input(“Please input the group name: “)

sID = int(input(“Please input the student id: “)

score = int(input(“Please input the score: “)

return((‘group’):groupname,

(‘id’):sid,

(‘score’):score)

grades = {}

data = readdata()

while data[‘score’] != -1:

insertrecord(grades,data[‘group’],data[‘id’],data[‘score’])

data = readdata()

print(grades)

print(‘FS5’,35,’=’,query(grades,’fs5’,35))

print(fs5’, listgrades(grades,’fs5’))