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**Python Code:**

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#Date and Time: 24/09/2024 \_\_\_ 01:37pm

#Task: session 3 and 4 SUBMISSION file

#1.1

course\_list = ["Introduction to Programming", "Calculus I", "Data Structures and Algorithms", "Linear Algebra", "Physics I", "Chemistry I", "Discrete Mathematics",

                "Biology I", "Microeconomics", "Macroeconomics", "Psychology I ", "History I", "English Composition I", "Introduction to Philosophy", "Calculus II"]

#1.2

print("")

print("Course list is",course\_list)

#2.1

print("")

course\_list = sorted(course\_list)

#2.2

print("")

print("Sorted Course list is",course\_list)

#2.3

course\_list = sorted(course\_list, reverse=True)

#2.4

print("")

print("Sorted reverse Course list is",course\_list)

#3.1

course\_list.reverse()

#3.2

print("")

print("after using reverse on list", course\_list)

#3.3

course\_list.reverse()

#3.4

print("")

print("after using reverse on list", course\_list)

#4.1

course\_list.sort()

#4.2

print("")

print("after sort function on last saved course list", course\_list)

#4.3

course\_list.sort(reverse=True)

#4.4

print("")

print("after using sort function with perameter reverse", course\_list)

##############        task done till page number 2        ##############

print("\n----------------Task done till page 2----------------")

course\_list = ["Introduction to Programming", "Calculus I", "Data Structures and Algorithms", "Linear Algebra", "Physics I", "Chemistry I", "Discrete Mathematics"]

#1.1 and 1.2

course\_list.sort()

print("\nThe following courses are available for expression of interest if the students meet the prerequisites:\n")

for course in course\_list:

    print(course)

#2.1 and 2.2

print("\nOne of the course is not availabe in given list. The course name is CALCULUS I and that course is replaceable with  PHYSICS I")

withdrawn\_course = "Calculus I"

new\_course = "Physics I"

print("\nHere is the orginal course list:")

for course in course\_list:

    print(course)

print("\nHere is the new list of available course:")

course\_list[course\_list.index(withdrawn\_course)] = new\_course

for course in course\_list:

    print(course)

#3.1, 3.2, 3.3, 3.4 and 3.5

course\_list = ["Physics I", "Chemistry I", "Data Structures and Algorithms",

               "Discrete Mathematics", "English Composition I", "Introduction to Philosophy",

               "Introduction to Programming", "Linear Algebra"]

newCourse= ["Biology I", "Macroeconomics", "Psychology I"]

course\_list.insert(0, newCourse[0])

course\_list.insert(len(course\_list) // 2, newCourse[1])

course\_list.append(newCourse[2])

print("\nThe updated course list with new courses added is:")

for course in course\_list:

    print(course)

#4.1, 4.2, 4.3 and 4.4

course\_list = ["Biology I", "Physics I", "Chemistry I", "Data Structures and Algorithms", "Discrete Mathematics", "English Composition I", "Introduction to Philosophy",

               "Introduction to Programming", "Linear Algebra", "Macroeconomics", "Psychology I"]

unavailable\_courses = []

print("\nDue to technical and room availability issues, the following courses are no longer available:")

for i in range(4):

    removed\_course = course\_list.pop()

    unavailable\_courses.append(removed\_course)

    print(removed\_course)

print("\nThe updated list of available courses is:")

for course in course\_list:

    print(course)

##############        task done till page number 3        ##############

print("\n----------------Task done till page 3----------------")

#1.1 and 1.2

courses = [

    (1, "Introduction to Programming"),

    (2, "Calculus I"),

    (3, "Data Structures and Algorithms"),

    (4, "Linear Algebra"),

    (5, "Physics I"),

    (6, "Chemistry I"),

    (7, "Biology I"),

    (8, "Microeconomics"),

    (9, "Macroeconomics"),

    (10, "Psychology I"),

    (11, "History I"),

    (12, "English Composition I"),

    (13, "Introduction to Philosophy"),

    (14, "Calculus II"),

    (15, "Discrete Mathematics")

]

course\_ids\_and\_names = []

#2.1 and 2.2

for course in courses:

    course\_id, course\_name = course

    course\_ids\_and\_names.append(course\_name)

print("\n",course\_ids\_and\_names)

#3

print("\nCourse Information:")

for course in courses:

    course\_id = course[0]

    course\_name = course[1]

    print("Course ID and Course Name:", course\_id,",", course\_name)

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########################      SESSION 4      ########################

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# 1. Conditional statement

courses = [

    (1, "Introduction to Programming"),

    (2, "Calculus I"),

    (3, "Data Structures and Algorithms"),

    (4, "Linear Algebra"),

    (5, "Physics I"),

    (6, "Chemistry I"),

    (7, "Biology I"),

    (8, "Microeconomics"),

    (9, "Macroeconomics"),

    (10, "Psychology I"),

    (11, "History I"),

    (12, "English Composition I"),

    (13, "Introduction to Philosophy"),

    (14, "Calculus II"),

    (15, "Discrete Mathematics")

]

user\_input = int(input("\nEnter the course ID you want to search for: "))

course\_found = False

for course in courses:

    if course[0] == user\_input:

        print(f"\nThe course name for ID {user\_input} is: {course[1]}")

        course\_found = True

        break

if not course\_found:

    print(f"\nNo course found with ID {user\_input}.")

while True:

    user\_input = input("Enter a command (type 'quit' or '0' to exit): ")

    if user\_input.lower() == "quit" or user\_input == "0":

        print("Exiting the loop...")

        break

    else:

        print("user input is", user\_input)

while True:

    user\_input = input("Enter a course ID, or type 'quit' or '0' to exit: ")

    if user\_input.lower() == "quit" or user\_input == "0":

        print("Exiting the program...")

        break

    if user\_input.isdigit():

        course\_id = int(user\_input)

        course\_found = False

        for course in courses:

            if course[0] == course\_id:

                print(f"Course ID {course\_id} corresponds to: {course[1]}")

                course\_found = True

                break

        if not course\_found:

            print(f"No course found with ID {course\_id}.")

    else:

        print("Invalid input. Please enter a valid course ID, 'quit', or '0'.")

# Sample course data

courses = [

    (1, "Introduction to Programming", "Computer Science"),

    (2, "Calculus I", "Mathematics"),

    (3, "Data Structures and Algorithms", "Computer Science"),

    (4, "Linear Algebra", "Mathematics"),

    (5, "Physics I", "Physics"),

    (6, "Chemistry I", "Chemistry"),

    (7, "Biology I", "Biology"),

    (8, "Microeconomics", "Economics"),

    (9, "Macroeconomics", "Economics"),

    (10, "Psychology I", "Psychology"),

]

while True:

    user\_input = input("Enter a course ID, or type 'quit' or '0' to exit: ")

    if user\_input.lower() == "quit" or user\_input == "0":

        print("Exiting the program...")

        break

    if user\_input.isdigit():

        course\_id = int(user\_input)

        course\_found = False

        for course in courses:

            if course[0] == course\_id:

                print(f"The course department for ID {course\_id} is: {course[2]}")

                course\_found = True

                break

        if not course\_found:

            print(f"No course found with ID {course\_id}.")

    else:

        print("Invalid input. Please enter a valid course ID, 'quit', or '0'.")

while True:

    user\_input = input("Enter a course ID (1-15)")

    if user\_input.isdigit():

        course\_id = int(user\_input)

        if 1 <= course\_id <= 15:

            for course in courses:

                if course[0] == course\_id:

                    print(f"Course ID {course\_id} is in the {course[2]} department.")

                    break

            break

        else:

            print("Course ID is out of range (1-15), try again.")

**#Output:**

PS D:\Milan\_Assignment\Programming Principal\session1> & 'c:\Program Files (x86)\Microsoft Visual Studio\Shared\Python39\_64\python.exe' 'c:\Users\hiten\.vscode\extensions\ms-python.debugpy-2024.10.0-win32-x64\bundled\libs\debugpy\adapter/../..\debugpy\launcher' '63161' '--' 'D:\Milan\_Assignment\Programming Principal\session1\lab\_excercise\_3 and 4 - file 1.py'

Course list is ['Introduction to Programming', 'Calculus I', 'Data Structures and Algorithms', 'Linear Algebra', 'Physics I', 'Chemistry I', 'Discrete Mathematics', 'Biology I', 'Microeconomics', 'Macroeconomics', 'Psychology I ', 'History I', 'English Composition I', 'Introduction to Philosophy', 'Calculus II']

Sorted Course list is ['Biology I', 'Calculus I', 'Calculus II', 'Chemistry I', 'Data Structures and Algorithms', 'Discrete Mathematics', 'English Composition I', 'History I', 'Introduction to Philosophy', 'Introduction to Programming', 'Linear Algebra', 'Macroeconomics', 'Microeconomics', 'Physics I', 'Psychology I ']

Sorted reverse Course list is ['Psychology I ', 'Physics I', 'Microeconomics', 'Macroeconomics', 'Linear Algebra', 'Introduction to Programming', 'Introduction to Philosophy', 'History I', 'English Composition I', 'Discrete Mathematics', 'Data Structures and Algorithms', 'Chemistry I', 'Calculus II', 'Calculus I', 'Biology I']

after using reverse on list ['Biology I', 'Calculus I', 'Calculus II', 'Chemistry I', 'Data Structures and Algorithms', 'Discrete Mathematics', 'English Composition I', 'History I', 'Introduction to Philosophy', 'Introduction to Programming', 'Linear Algebra', 'Macroeconomics', 'Microeconomics', 'Physics I', 'Psychology I ']

after using reverse on list ['Psychology I ', 'Physics I', 'Microeconomics', 'Macroeconomics', 'Linear Algebra', 'Introduction to Programming', 'Introduction to Philosophy', 'History I', 'English Composition I', 'Discrete Mathematics', 'Data Structures and Algorithms', 'Chemistry I', 'Calculus II', 'Calculus I', 'Biology I']

after sort function on last saved course list ['Biology I', 'Calculus I', 'Calculus II', 'Chemistry I', 'Data Structures and Algorithms', 'Discrete Mathematics', 'English Composition I', 'History I', 'Introduction to Philosophy', 'Introduction to Programming', 'Linear Algebra', 'Macroeconomics', 'Microeconomics', 'Physics I', 'Psychology I ']

after using sort function with perameter reverse ['Psychology I ', 'Physics I', 'Microeconomics', 'Macroeconomics', 'Linear Algebra', 'Introduction to Programming', 'Introduction to Philosophy', 'History I', 'English Composition I', 'Discrete Mathematics', 'Data Structures and Algorithms', 'Chemistry I', 'Calculus II', 'Calculus I', 'Biology I']

----------------Task done till page 2----------------

The following courses are available for expression of interest if the students meet the prerequisites:

Calculus I

Chemistry I

Data Structures and Algorithms

Discrete Mathematics

Introduction to Programming

Linear Algebra

Physics I

One of the course is not availabe in given list. The course name is CALCULUS I and that course is replaceable with PHYSICS I

Here is the orginal course list:

Calculus I

Chemistry I

Data Structures and Algorithms

Discrete Mathematics

Introduction to Programming

Linear Algebra

Physics I

Here is the new list of available course:

Physics I

Chemistry I

Data Structures and Algorithms

Discrete Mathematics

Introduction to Programming

Linear Algebra

Physics I

The updated course list with new courses added is:

Biology I

Physics I

Chemistry I

Data Structures and Algorithms

Macroeconomics

Discrete Mathematics

English Composition I

Introduction to Philosophy

Introduction to Programming

Linear Algebra

Psychology I

Due to technical and room availability issues, the following courses are no longer available:

Psychology I

Macroeconomics

Linear Algebra

Introduction to Programming

The updated list of available courses is:

Biology I

Physics I

Chemistry I

Data Structures and Algorithms

Discrete Mathematics

English Composition I

Introduction to Philosophy

----------------Task done till page 3----------------

['Introduction to Programming', 'Calculus I', 'Data Structures and Algorithms', 'Linear Algebra', 'Physics I', 'Chemistry I', 'Biology I', 'Microeconomics', 'Macroeconomics', 'Psychology I', 'History I', 'English Composition I', 'Introduction to Philosophy', 'Calculus II', 'Discrete Mathematics']

Course Information:

Course ID and Course Name: 1 , Introduction to Programming

Course ID and Course Name: 2 , Calculus I

Course ID and Course Name: 3 , Data Structures and Algorithms

Course ID and Course Name: 4 , Linear Algebra

Course ID and Course Name: 5 , Physics I

Course ID and Course Name: 6 , Chemistry I

Course ID and Course Name: 7 , Biology I

Course ID and Course Name: 8 , Microeconomics

Course ID and Course Name: 9 , Macroeconomics

Course ID and Course Name: 10 , Psychology I

Course ID and Course Name: 11 , History I

Course ID and Course Name: 12 , English Composition I

Course ID and Course Name: 13 , Introduction to Philosophy

Course ID and Course Name: 14 , Calculus II

Course ID and Course Name: 15 , Discrete Mathematics

Enter the course ID you want to search for: 5

The course name for ID 5 is: Physics I

Enter a command (type 'quit' or '0' to exit): 0

Exiting the loop...

Enter a course ID, or type 'quit' or '0' to exit: 0

Exiting the program...

Enter a course ID, or type 'quit' or '0' to exit: 0

Exiting the program...

Enter a course ID (1-15)4

Course ID 4 is in the Mathematics department.