

Applied Databases

Higher Diploma in Science in Data Analytics Innovation and extra functionality

Part 1:

A function to clear the screen for user after a period of time

```
# https://www.geeksforgeeks.org/clear-screen-python/
# import only system from os
# import sleep to show output for some time period
# define our clear function
def clear():
    # sleep(2)
    # for windows
    if name == 'nt':
        _ = system('cls')
    # for mac and linux(here, os.name is 'posix')
    else:
        _ = system('clear')

ProjectApp.display_menu()
```

Part 2:

A countdown function to display to user when output from choice will clear and return to the main menu

```
def countdown():
    print("\nClearing Data on Screen and Returning to Main Menu in:")
    for i in range(9,0,-1):
        # print number to screen then remove
        print(f"{i}", end="\r", flush=True)
        # pause program for 1 second
        sleep(1)
```

Part 3:

A function to check if files are present to run the app

- *ProjectApp.py*
- *ProjectAppMySQL.py*
- *ProjectInnovation.py*
- *ProjectAppNeo4j.py*

```
# Function to check if all files required for the app are present in the same folder
# Assist in debugging for the app
def app_checker():
    # List of Files
```

```

appfiles = ["ProjectAppMySQL.py", "ProjectInnovation.py", "ProjectAppNeo4j.py"]
# Get current working directory
filelocation = os.path.dirname(__file__)
# Use list of file to check if that they are present
for file in appfiles:
    try:
        # try open file using path and filename
        # output to screen
        with open(filelocation + "\\ " + file) as f:
            print("\nProject Apps File Found")
            print(file)
    except IOError:
        # Error if files not found outpur missing file name
        print("\nProject Apps File Not Found " + file)
        return false
return true

```

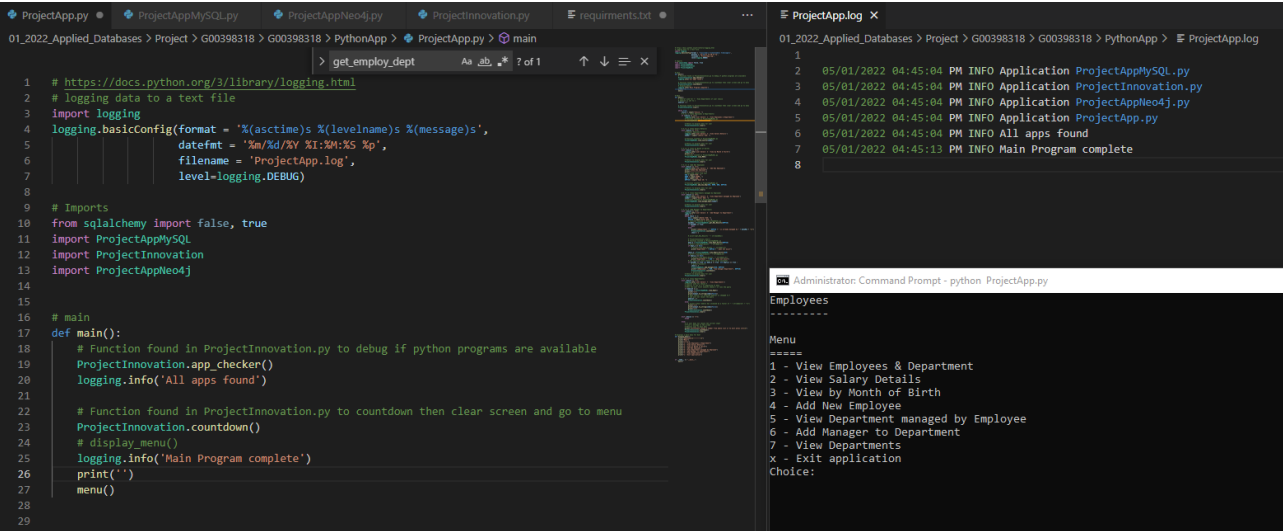
Part 4:

Logging the application to check if elements are working from the specification sheet (requires command prompt admin level privileges)

This is a great tool in python to log information for troubleshoot the application

All examples below show the output to the logs for each of the examples from the specification sheet

Program loads required programs. Outputs to logging file



#####

Select Choice 1

```
ProjectApp.py | ProjectAppMySQL.py | ProjectAppMySQL.py | ProjectInnovation.py | requirements.txt | ... | ProjectAppLog X
01_2022_Applied_Databases > Project > G00398318 > G00398318 > PythonApp > ProjectApp.py > menu
34
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39
40 choice = input("Choice: ")
41 # 4.4.1.1 (View Employees & Departments)
42 if (choice == "1"):
43     logging.info("user Select: 1 - View Employees & Department")
44     # Function located in ProjectAppMySQL.py
45     ProjectAppMySQL.get_employee_dept()
46
47     # Return to display menu for user
48     ProjectInnovation.clear()
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```

```
01_2022_Applied_Databases > Project > G00398318 > G00398318 > PythonApp > ProjectAppLog
1
2 05/01/2022 04:45:04 PM INFO Application ProjectAppMySQL.py
3 05/01/2022 04:45:04 PM INFO Application ProjectInnovation.py
4 05/01/2022 04:45:04 PM INFO Application ProjectAppMySQL.py
5 05/01/2022 04:45:04 PM INFO Application ProjectApp.py
6 05/01/2022 04:45:04 PM INFO All apps found
7 05/01/2022 04:45:13 PM INFO Main Program complete
8 05/01/2022 04:53:43 PM INFO user Select: 1 - View Employees & Department
9 05/01/2022 04:53:43 PM INFO Connect to MySQL05/01/2022 04:55:58 PM INFO user Select: 1 - View Emp
10 05/01/2022 04:55:58 PM INFO Connect to MySQL
11 05/01/2022 04:55:58 PM INFO Select e.name as employee, d.name as department
12
13     from employee e
14     JOIN dept d
15     ON e.did = d.did
16     ORDER by e.name
17     LIMIT 2 OFFSET %s;
18
19
20
21
```

```
Administrator Command Prompt - python ProjectApp.py
Employees
-----
Menu
-----
1 - View Employees & Department
2 - View Salary Details
3 - View by Month of Birth
4 - Add New Employee
5 - View Department managed by Employee
6 - Add Manager to Department
7 - View Departments
x - Exit application
Choice: 1
Aine Flynn | Human Resources
Alice Hughes | Sales - West
-- Quit (q) --
```

Query database and q to quit

```
# 4.4.1.1 (View Employees & Departments)
# The user is shown the list of Employee Names (in alphabetical order) and the Names of the
# Department each employee works in, in groups of 2:
def get_employee_dept():
    # a is required to set to zero for offset
    a = 0
    quit = ""
    while (quit != "q"):
        cursor = connect()

        query = """ Select e.name as employee, d.name as department
        from employee e
        JOIN dept d
        ON e.did = d.did
        ORDER by e.name
        LIMIT 2 OFFSET %s; """

        with conn:
            # logging query
            logging.info(query)

            cursor.execute(query, (a))
            employ_dept = cursor.fetchall()

            for x in employ_dept:
                print(x["employee"], "|", x["department"])

            # increase a by two to increase the offset for query
            a = a + 2

            # User can only input q to quit
            quit = input("-- Quit (q) --")
            logging.info('User input to quit ' + quit)

    conn.close
    logging.info('Close SQL connection for Choice 1')
```

```
5 05/01/2022 04:45:04 PM INFO Application ProjectApp.py
6 05/01/2022 04:45:04 PM INFO All apps found
7 05/01/2022 04:45:13 PM INFO Main Program complete
8 05/01/2022 04:53:43 PM INFO user Select: 1 - View Employees & Department
9 05/01/2022 04:53:43 PM INFO Connect to MySQL05/01/2022 04:55:58 PM INFO user Select: 1 - View Emp
10 05/01/2022 04:55:58 PM INFO Connect to MySQL
11 05/01/2022 05:00:12 PM INFO User input to quit
12 05/01/2022 05:00:12 PM INFO Connect to MySQL
13 05/01/2022 05:00:12 PM INFO Select e.name as employee, d.name as department
14
15     from employee e
16     JOIN dept d
17     ON e.did = d.did
18     ORDER by e.name
19     LIMIT 2 OFFSET %s;
20 05/01/2022 05:02:40 PM INFO User input to quit q
21 05/01/2022 05:02:40 PM INFO Close SQL connection for Choice 1
```

```
Select Administrator Command Prompt - python ProjectApp.py
Employees
-----
Menu
-----
1 - View Employees & Department
2 - View Salary Details
3 - View by Month of Birth
4 - Add New Employee
5 - View Department managed by Employee
6 - Add Manager to Department
7 - View Departments
x - Exit application
Choice:
```

#####

Choice 2 input with output of salary

```
ProjectApp.py | ProjectAppMySQL.py | ProjectAppMySQL.py | ProjectInnovation.py | requirements.txt | ... | ProjectAppLog X
01_2022_Applied_Databases > Project > G00398318 > G00398318 > PythonApp > ProjectAppLog > menu
43
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51 elif (choice == "2"):
52     # Request Employee Number
53     logging.info("user Select: 2 - View Salary Details")
54     number = input("\nEnter EID: ")
55
56     logging.info('Enter EID: ' + number)
57     # Function located in ProjectAppMySQL.py
58     ProjectAppMySQL.view_salary(number)
59
60     # Return to display menu for user
61     ProjectInnovation.clear()
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```

```
01_2022_Applied_Databases > Project > G00398318 > G00398318 > PythonApp > ProjectAppLog
12 05/01/2022 05:00:12 PM INFO Connect to MySQL
13 05/01/2022 05:00:12 PM INFO Select e.name as employee, d.name as department
14
15     from employee e
16     JOIN dept d
17     ON e.did = d.did
18     ORDER by e.name
19     LIMIT 2 OFFSET %s;
20 05/01/2022 05:02:40 PM INFO User input to quit q
21 05/01/2022 05:02:40 PM INFO Close SQL connection for Choice 1
22 05/01/2022 05:07:56 PM INFO Application ProjectAppMySQL.py
23 05/01/2022 05:07:56 PM INFO Application ProjectInnovation.py
24 05/01/2022 05:07:56 PM INFO Application ProjectAppMySQL.py
25 05/01/2022 05:07:56 PM INFO Application ProjectApp.py
26 05/01/2022 05:08:05 PM INFO Main Program complete
27 05/01/2022 05:08:27 PM INFO user Select: 2 - View Salary Details
28 05/01/2022 05:09:04 PM INFO user Enter EID: E01
29 05/01/2022 05:09:04 PM INFO Connect to MySQL
30 05/01/2022 05:09:04 PM INFO Select format(min(salary),0) AS Minimum, format(avg(salary),0) AS Av
31
32     from salary
33     WHERE eid = %s;
34
35
36
37
```

```
Administrator Command Prompt - python ProjectApp.py
Employees
-----
Menu
-----
1 - View Employees & Department
2 - View Salary Details
3 - View by Month of Birth
4 - Add New Employee
5 - View Department managed by Employee
6 - Add Manager to Department
7 - View Departments
x - Exit application
Choice: 2
Enter EID: E01
Salary Details for Employee:E01
-----
Minimum | Average | Maximum
15,000 | 29,617 | 41,234.21
Clearing Data on Screen and go to Main Menu in:
```

Records user input if non-existent Employee ID

```

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61 # 4.4.2 2 (View Salary Details)
62 # The user is asked to enter an Employee ID:
63 def view_salary(number):
64     print("\nSalary Details for Employee: " + number)
65     print("-----")
66     cursor = connect()
67     query = """ Select format(min(salary),0) AS Minimum, format(avg(salary),0) AS Average, format
68               from salary
69               WHERE eid = %s; """
70
71     with conn:
72
73         logging.info(query)
74
75         cursor.execute(query, number)
76         Salaryresults = cursor.fetchall()
77         field_names = [i[0] for i in cursor.description]
78         print(*field_names, sep="\t\t")
79         for value in Salaryresults:
80             if value["Minimum"] == None:
81                 ProjectInnovation.countdown()
82                 logging.info("No employee number of " + number)
83                 return
84             else:
85                 print(value["Minimum"], "\t\t", value["Average"], "\t\t", value["Maximum"] )
86
87     conn.close
88     logging.info('Close SQL connection for Choice 1')
89     ProjectInnovation.countdown()
90
91
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```

```

01_2022_Applied_Databases > Project > G00398318 > PythonApp > ProjectAppMySQL.py > view_salary
05/01/2022 05:08:47 PM INFO user Select: 2 - View Salary Details
05/01/2022 05:09:04 PM INFO Enter EID: E01
05/01/2022 05:09:04 PM INFO Connect to MySQL
05/01/2022 05:09:04 PM INFO Select format(min(salary),0) AS Minimum, format(avg(salary),0) AS Av
05/01/2022 05:09:04 PM INFO WHERE eid = %s;
05/01/2022 05:14:19 PM INFO Close SQL connection for Choice 1
05/01/2022 05:14:15 PM INFO user Select: 2 - View Salary Details
05/01/2022 05:14:19 PM INFO Enter EID: asdf
05/01/2022 05:14:19 PM INFO Connect to MySQL
05/01/2022 05:14:19 PM INFO Select format(min(salary),0) AS Minimum, format(avg(salary),0) AS Av
05/01/2022 05:14:19 PM INFO from salary
05/01/2022 05:14:28 PM INFO WHERE eid = %s;
05/01/2022 05:14:28 PM INFO No employee number of asdf

```

```

Administrator Command Prompt - python ProjectApp.py
Employees
-----
Menu
-----
1 - View Employees & Department
2 - View Salary Details
3 - View by Month of Birth
4 - Add New Employee
5 - View Department managed by Employee
6 - Add Manager to Department
7 - View Departments
x - Exit application
Choice: 2

Enter EID: asdf

Salary Details for Employee:asdf
-----
Minimum | Average | Maximum
-----
Clearing Data on Screen and go to Main Menu in:

```

#####

Choice 3 User input incorrect month format def view_MOB()

```

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61
62
63 # 4.4.3 3 (View by Month of Birth)
64 elif (choice == "3"):
65     logging.info("user Select: 3 - View by Month of Birth")
66     print("\n")
67     # Function located in ProjectAppMySQL.py
68     ProjectAppMySQL.view_MOB()
69
70     # Return to display menu for user
71     ProjectInnovation.clear()
72
73
74
75
76
77
78
79
80
81
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98
99
100
101

```

```

01_2022_Applied_Databases > Project > G00398318 > PythonApp > ProjectAppMySQL.py > view_salary
05/01/2022 05:14:28 PM INFO No employee number of asdf
05/01/2022 05:15:10 PM INFO user Select: 2 - View Salary Details
05/01/2022 05:15:14 PM INFO Enter EID: asdf
05/01/2022 05:15:14 PM INFO Connect to MySQL
05/01/2022 05:15:14 PM INFO Select format(min(salary),0) AS Minimum, format(avg(salary),0) AS Av
05/01/2022 05:15:14 PM INFO from salary
05/01/2022 05:15:23 PM INFO WHERE eid = %s;
05/01/2022 05:15:23 PM INFO No employee number of asdf
05/01/2022 05:36:43 PM INFO user Select: 3 - View by Month of Birth
05/01/2022 05:36:45 PM INFO User input month 13
05/01/2022 05:36:45 PM INFO The user has not input the required month None and start again
05/01/2022 05:36:54 PM INFO User input month March
05/01/2022 05:38:38 PM INFO User input month Mar
05/01/2022 05:38:38 PM INFO Connect to MySQL
05/01/2022 05:38:38 PM INFO Select eid, name, DATE_FORMAT(dob, "%Y-%m-%d") as NewDate
05/01/2022 05:38:38 PM INFO from employee
05/01/2022 05:38:38 PM INFO WHERE month(dob) = 3;
05/01/2022 05:38:38 PM INFO Close SQL connection for Choice 3

```

```

Administrator Command Prompt - python ProjectApp.py
Employees
-----
Menu
-----
1 - View Employees & Department
2 - View Salary Details
3 - View by Month of Birth
4 - Add New Employee
5 - View Department managed by Employee
6 - Add Manager to Department
7 - View Departments
x - Exit application
Choice: 3

Enter Month: 13
Enter Month: March
E11 | James Doherty | 1974-03-13
E20 | Veronika | 1979-03-01

Clearing Data on Screen and go to Main Menu in:

```

def view_MOB() test the user input is the correct format for month

The screenshot shows a VS Code editor with two main panes. The left pane displays the Python code for a function `view_MOB()` and a function `add_new_Emp()`. The right pane shows the application log, which includes timestamps, user input, and SQL queries.

```

112
113
114 # This function to detect user input
115 def view_MOB():
116     # Set mobresult to none
117     mobresult = None
118
119     while mobresult is None:
120         # Request Employee Number
121         usermonth = input("Enter Month: ")
122         logging.info('User input month ' + usermonth)
123         try:
124             if (usermonth.isdigit() == True):
125                 intmonth = int(usermonth)
126                 logging.info('The user has input an integer ' + intmonth)
127                 if intmonth in range(1,13):
128                     logging.info('The integer is the integer month of ' + intmonth)
129                     # Function to run SQL query
130                     qresults(intmonth)
131                     mobresult = 1
132                     logging.info('The user input the correct integer month set mobresult to ' + str(
133
134             elif len(usermonth) == 3:
135                 try:
136                     datetime_object = datetime.strptime(usermonth, "%b")
137                     intmonth = datetime_object.month
138                     # Function to run SQL query
139                     qresults(intmonth)
140                     mobresult = 2
141                     logging.info('The user input the correct using the first 3 characters of the mon
142                 except:
143                     pass
144             except:
145                 logging.info('The user has not input the required month ' + str(mobresult) + ' and start
146                 pass
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157
158
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```

```

39 WHERE eid = %s;
40 05/01/2022 05:14:28 PM INFO No employee number of asdf
41 05/01/2022 05:15:18 PM INFO user Select: 2 - View Salary Details
42 05/01/2022 05:15:14 PM INFO Enter EID: asdf
43 05/01/2022 05:15:14 PM INFO Connect to MySQL
44 05/01/2022 05:15:14 PM INFO Select format(min(salary),0) AS Minimum, format(avg(salary),0) AS
45         from salary
46         WHERE eid = %s;
47 05/01/2022 05:15:23 PM INFO No employee number of asdf
48 05/01/2022 05:36:43 PM INFO user Select: 3 - View by Month of Birth
49 05/01/2022 05:36:45 PM INFO User input month 13
50 05/01/2022 05:36:45 PM INFO The user has not input the required month None and start again
51 05/01/2022 05:36:54 PM INFO User input month March
52 05/01/2022 05:38:38 PM INFO User input month Mar
53 05/01/2022 05:38:38 PM INFO Connect to MySQL
54 05/01/2022 05:38:38 PM INFO Select eid, name, DATE_FORMAT(dob, "%Y-%m-%d") as NewDate
55         from employee
56         WHERE month(dob) = 3;
57 05/01/2022 05:38:38 PM INFO Close SQL connection for Choice 3
58 05/01/2022 05:40:34 PM INFO User input month Mar
59 05/01/2022 05:40:34 PM INFO Connect to MySQL
60 05/01/2022 05:40:34 PM INFO Select eid, name, DATE_FORMAT(dob, "%Y-%m-%d") as NewDate
61         from employee
62         WHERE month(dob) = 3;
63 05/01/2022 05:40:34 PM INFO Close SQL connection for Choice 3
64 05/01/2022 05:40:43 PM INFO The user input the correct using the first 3 characters of the mon
65

```

Input month as aPr

The screenshot shows a VS Code editor with two main panes. The left pane displays the Python code for a function `view_MOB()` and a function `add_new_Emp()`. The right pane shows the application log, which includes timestamps, user input, and SQL queries. A terminal window at the bottom shows the application menu and user input.

```

113
114 # This function to detect user input
115 def view_MOB():
116     # Set mobresult to none
117     mobresult = None
118
119     while mobresult is None:
120         # Request Employee Number
121         usermonth = input("Enter Month: ")
122         logging.info('User input month ' + usermonth)
123         try:
124             if (usermonth.isdigit() == True):
125                 intmonth = int(usermonth)
126                 logging.info('The user has input an integer ' + intmonth)
127                 if intmonth in range(1,13):
128                     logging.info('The integer is the integer month of ' + intmonth)
129                     # Function to run SQL query
130                     qresults(intmonth)
131                     mobresult = 1
132                     logging.info('The user input the correct integer month set mobresult to ' + str(
133
134             elif len(usermonth) == 3:
135                 try:
136                     datetime_object = datetime.strptime(usermonth, "%b")
137                     intmonth = datetime_object.month
138                     # Function to run SQL query
139                     qresults(intmonth)
140                     mobresult = 2
141                     logging.info('The user input the correct using the first 3 characters of the mon
142                 except:
143                     pass
144             except:
145                 logging.info('The user has not input the required month ' + str(mobresult) + ' and start
146                 pass
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```

```

60 05/01/2022 05:40:34 PM INFO Select eid, name, DATE_FORMAT(dob, "%Y-%m-%d") as NewDate
61         from employee
62         WHERE month(dob) = 3;
63 05/01/2022 05:40:34 PM INFO Close SQL connection for Choice 3
64 05/01/2022 05:40:43 PM INFO The user input the correct using the first 3 characters of the mon
65 05/01/2022 05:50:20 PM INFO User input month
66 05/01/2022 05:50:20 PM INFO User input month
67 05/01/2022 05:50:20 PM INFO User input month
68 05/01/2022 05:50:32 PM INFO User input month aPr
69 05/01/2022 05:50:32 PM INFO Connect to MySQL
70 05/01/2022 05:50:32 PM INFO Select eid, name, DATE_FORMAT(dob, "%Y-%m-%d") as NewDate
71         from employee
72         WHERE month(dob) = 4;
73 05/01/2022 05:50:32 PM INFO Close SQL connection for Choice 3
74

```

```

Administrator: Command Prompt - python ProjectApp.py
Employees
-----
Menu
====
1 - View Employees & Department
2 - View Salary Details
3 - View by Month of Birth
4 - Add New Employee
5 - View Department managed by Employee
6 - Add Manager to Department
7 - View Departments
x - Exit application
Choice: 3

Enter Month:
Enter Month:
Enter Month: aPr
E02 | Mary Byrne | 1990-04-02
E14 | James Taylor | 1991-04-05
E15 | Ian Jones | 1984-04-27

Clearing Data on Screen and go to Main Menu in:
1

```

qresults(intmonth) function is run when user inputs the correct format.

```
ProjectApp.py x ProjectAppMySQL.py x ProjectAppNeo4j.py ProjectInnovation.py requirements.txt
01_2022_Applied_Databases > Project > G00398318 > G00398318 > PythonApp > ProjectAppMySQL.py > view_MOB
83
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92
93 4.4.3 3 (View by Month of Birth)
94 The user is asked to enter a Month
95 Function for SQL query to output results
96 This function will only be called after user has input the correct month
97 from view_MOB()
98 f qresults(intmonth):
99     cursor = connect()
100     query = """ Select eid, name, DATE_FORMAT(dob, "XY-%m-%d") as NewDate
101                from employee
102                WHERE month(dob) = {}; """.format(intmonth)
103
104     with conn:
105         cursor.execute(query)
106         logging.info(query)
107         iresults = cursor.fetchall()
108         for value in iresults:
109             print(value["eid"], "|", value["name"], "|", value["NewDate"] )
110     conn.close
111     logging.info('Close SQL connection for Choice 3')
112     ProjectInnovation.countdown()
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152 05/01/2022 06:02:26 PM INFO user Select: 3 - View by Month of Birth
153 05/01/2022 06:02:28 PM INFO User input month 3
154 05/01/2022 06:02:28 PM INFO The user has input an integer 3
155 05/01/2022 06:02:28 PM INFO The integer is the integer month of 3
156 05/01/2022 06:02:28 PM INFO Connect to MySQL
157 05/01/2022 06:02:28 PM INFO Select eid, name, DATE_FORMAT(dob, "XY-%m-%d") as NewDate
158                from employee
159                WHERE month(dob) = 3;
160 05/01/2022 06:02:28 PM INFO Close SQL connection for Choice 3
161 05/01/2022 06:02:37 PM INFO The user input the correct integer month set mobresult to 1 and ex
162

Administrator: Command Prompt - python ProjectApp.py
Employees
-----
Menu
=====
1 - View Employees & Department
2 - View Salary Details
3 - View by Month of Birth
4 - Add New Employee
5 - View Department managed by Employee
6 - Add Manager to Department
7 - View Departments
x - Exit application
Choice: 3

Enter Month: 3
E11 | James Doherty | 1974-03-13
E20 | Veronika | 1979-03-01

Clearing Data on Screen and go to Main Menu in:
a
```

#####

Choice 4

Error on Date

```
# 4.4.4 4 (Add New Employee)
# The user is asked to enter an Employee ID, Name, and date of birth, as well as the ID of the
# department the employee will work in
def add_new_Emp(EID, NAME, DOB, DEPTID):
    # print("Part4")
    cursor = connect()

    query = "INSERT INTO employee VALUES (%s, %s, %s, %s)"

    try:
        logging.info(query)
        with conn:
            cursor.execute(query, (EID, NAME, DOB, DEPTID))

        conn.close
        logging.info('Close SQL connection for Choice 4')
        print("\nEmployee successfully added")

    except pymysql.err.IntegrityError as e:
        errors = str(e)
        if '1062' in errors:
            print("\n*** ERROR ***: " + EID + " already exists")
            logging.warning('1062 error: ' + str(e))
            sleep(2)
        elif '1452' in errors:
            print("\n*** ERROR ***: Department " + DEPTID + " does not exists")
            logging.warning('1452 error: ' + str(e))
            sleep(2)
        else:
            pass
    except pymysql.err.OperationalError as e:
        print("\n*** ERROR ***: Invalid DOB: " + DOB )
        logging.warning('Invalid DOB: ' + str(e))
        sleep(2)
    except Exception as e:
        logging.warning(str(e))
        pass
    ProjectInnovation.countdown()
```

Administrator: Command Prompt - python ProjectApp.py

Employees

Menu

1 - View Employees & Department
2 - View Salary Details
3 - View by Month of Birth
4 - Add New Employee
5 - View Department managed by Employee
6 - Add Manager to Department
7 - View Departments
x - Exit application
Choice: 4

Add New Employee

EID: E99
NAME: Dave
DOB: 2002-01-99
Dept ID: HR

*** ERROR ***: Invalid DOB: 2002-01-99

Clearing Data on Screen and go to Main Menu in:

Error on Department

```
ProjectApp.py X ProjectAppMySQL.py X ProjectAppNeo4j.py X ProjectInnovation.py X requirements.txt X
01_2022_Applied_Databases > Project > G00398318 > PythonApp > ProjectAppMySQL.py > add_new_Emp
148
149
150 # 4.4.4 4 (Add New Employee)
151 # The user is asked to enter an Employee ID, Name, and date of birth, as well as the ID of the
152 # department the employee will work in
153 def add_new_Emp(EID, NAME, DOB, DEPTID):
154     # print("Part4")
155     cursor = connect()
156
157     query = "INSERT INTO employee VALUES (%s, %s, %s, %s)"
158
159     try:
160         logging.info(query)
161         with conn:
162             cursor.execute(query, (EID, NAME, DOB, DEPTID))
163
164         conn.close
165         logging.info('Close SQL connection for Choice 4')
166         print("\nEmployee successfully added")
167
168     except pymysql.err.IntegrityError as e:
169         errors = str(e)
170         if '1062' in errors:
171             print("\n*** ERROR ***: " + EID + " already exists")
172             logging.warning('1062 error: ' + str(e))
173             sleep(2)
174         elif '1452' in errors:
175             print("\n*** ERROR ***: Department " + DEPTID + " does not exists")
176             logging.warning('1452 error: ' + str(e))
177             sleep(2)
178         else:
179             pass
180     except pymysql.err.OperationalError as e:
181         print("\n*** ERROR ***: Invalid DOB: " + DOB )
182         logging.warning('Invalid DOB: ' + str(e))
183         sleep(2)
184     except Exception as e:
185         logging.warning(str(e))
186         pass
187     ProjectInnovation.countdown()
188
189
190
191 # 4.4.5 5 (View Departments managed by Employee)
192 # The user is asked to enter an Employee ID. The Name and Budget of all departments managed by the
193 # employee with that ID are returned
194 def view_manage_dept(number):
195
196     print("\nDepartments Managed by: " + number)
```

Administrator: Command Prompt - python ProjectApp.py

Employees

Menu

1 - View Employees & Department
2 - View Salary Details
3 - View by Month of Birth
4 - Add New Employee
5 - View Department managed by Employee
6 - Add Manager to Department
7 - View Departments
x - Exit application
Choice: 4

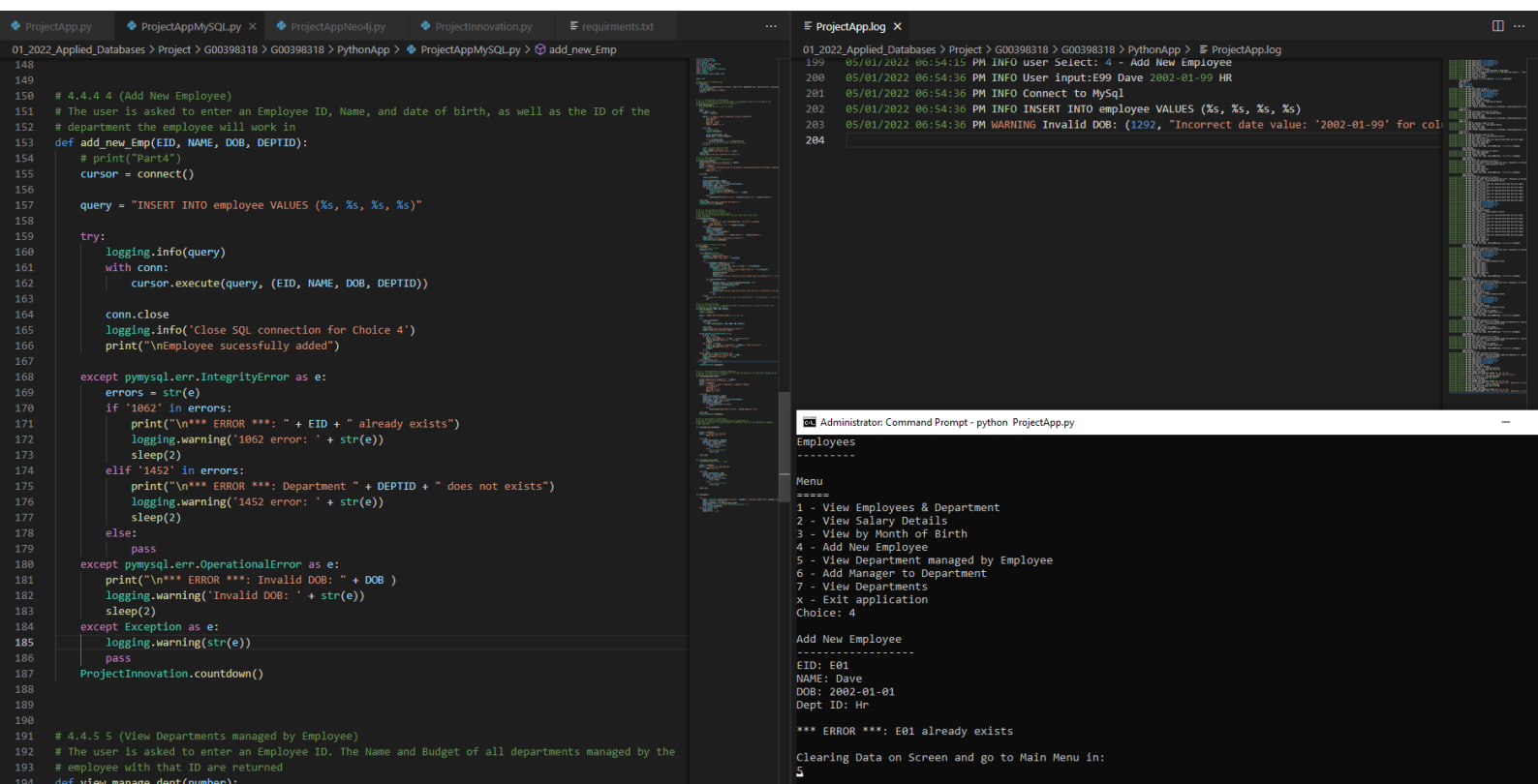
Add New Employee

EID: E98
NAME: Dave
DOB: 2002-01-01
Dept ID: XXX

*** ERROR ***: Department XXX does not exists

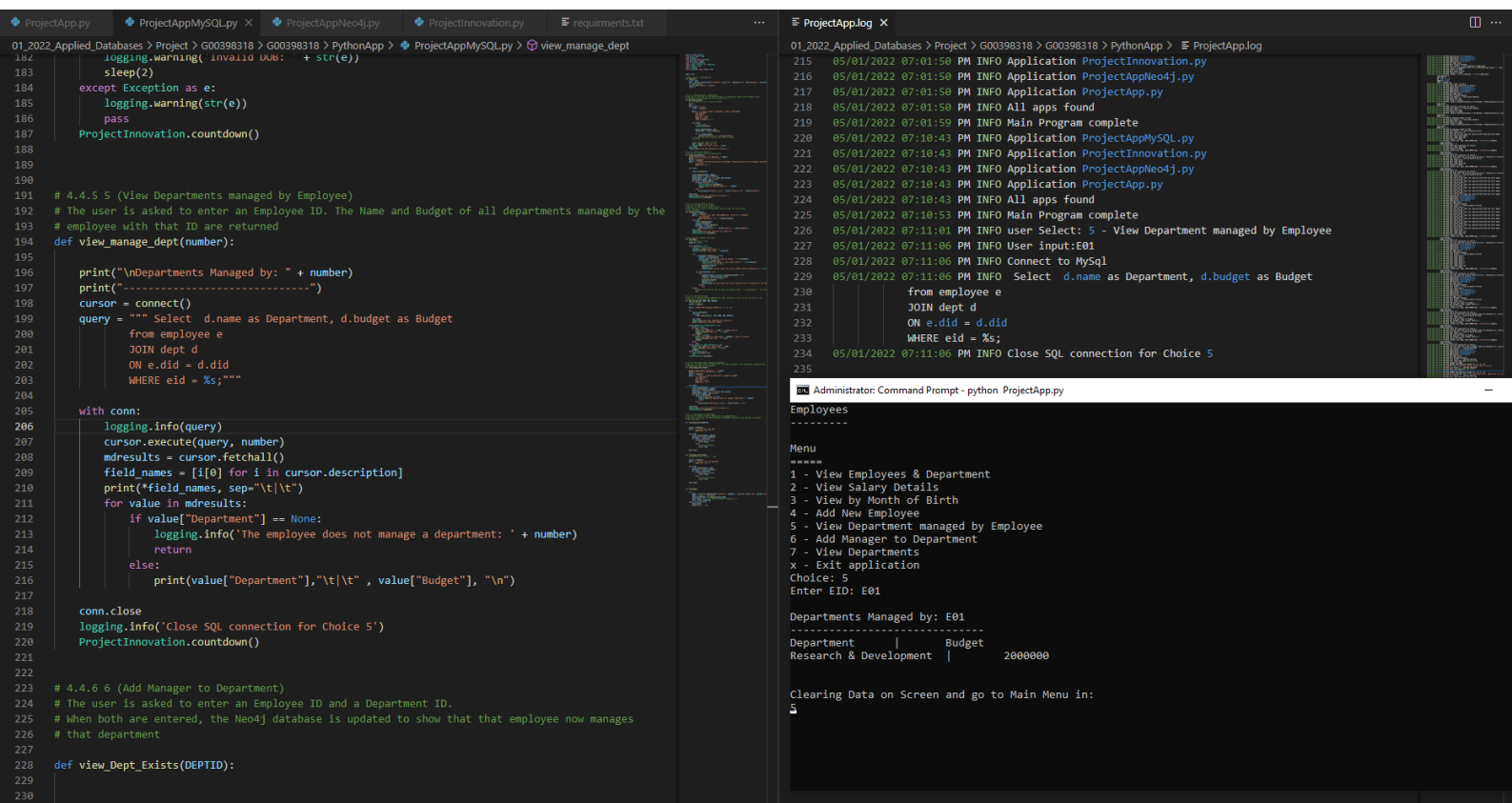
Clearing Data on Screen and go to Main Menu in:

Error Duplicate Employee



#####

Choice 5



#####

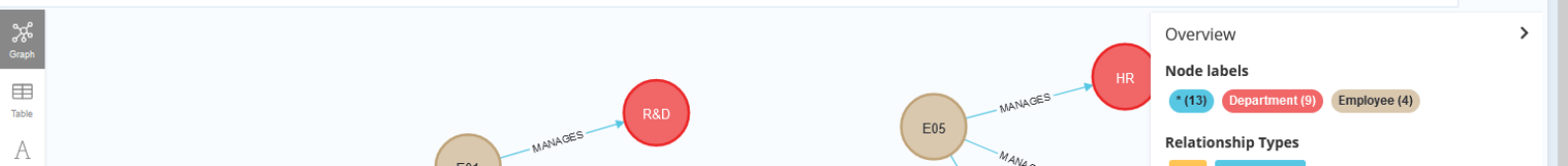
Choice 6

Adding

```
ProjectApp.py X ProjectAppMySQL.py ProjectAppNeo4j.py ProjectInnovation.py requirements.txt
01_2022_Applied_Databases > Project > G00398318 > G00398318 > PythonApp > ProjectApp.py > menu
100 ProjectInnovation.clear()
101
102 # 4.4.6 6 (Add Manager to Department)
103 elif (choice == "6"):
104     logging.info('user Select: 6 - Add Manager to Department')
105     check = ""
106     while check != 1:
107         EID = input("\nEnter EID: ")
108         DEPTID = input("Enter DID: ")
109         logging.info('User input: ' + EID + ' ' + DEPTID)
110         # Function located in ProjectAppNeo4j.py
111         manaNeo = ProjectAppNeo4j.get_Neo_Results(DEPTID)
112         if manaNeo == True:
113             pass
114         else:
115             print("\nDepartment " + DEPTID + " is already managed by " + manaNeo + "\n")
116             logging.info("Department " + DEPTID + " is already managed by " + str(manaNeo))
117             ProjectInnovation.countdown()
118             # check is equal to 1 exit while loop
119             check = 1
120     logging.info("Result of manaNeo " + str(manaNeo))
121
122 # ProjectInnovation.clear()
123 # Function located in ProjectAppMySQL.py
124 dept_e = ProjectAppMySQL.view_Dept_Exists(DEPTID)
125 # print("view_Dept_Exists " + str(dept_e))
126 if dept_e == None:
127     logging.info("Department " + DEPTID + " does not exist")
128     print("Department " + DEPTID + " does not exist")
129     logging.info("view_Dept_Exists " + str(dept_e))
130
131 # Function located in ProjectAppMySQL.py
132 emp_e = ProjectAppMySQL.view_Emplo_Exists(EID)
133 # print("view_Emplo_Exists " + str(emp_e))
134 if emp_e == None:
135     logging.info("Department " + EID + " does not exist")
136     print("Department " + EID + " does not exist")
137     logging.info("view_Emplo_Exists " + str(emp_e))
138
139 # all functions must return true to be succesful.
140 if manaNeo == True and dept_e == True and emp_e == True :
141     # check is equal to 1 exit while loop
142     check = 1
143     ProjectAppNeo4j.add_manages(EID, DEPTID)
144     print("\nEmployee: ", EID, "now manages Department", DEPTID)
145     ProjectInnovation.countdown()
146     logging.info("Add Manager to Department is successful")
147
148 # Return to display menu for user
149
ProjectAppLog X
01_2022_Applied_Databases > Project > G00398318 > G00398318 > PythonApp > ProjectAppLog
581 05/01/2022 07:44:00 PM INFO Application ProjectInnovation.py
582 05/01/2022 07:44:00 PM INFO Application ProjectAppNeo4j.py
583 05/01/2022 07:44:00 PM INFO Application ProjectAppNeo4j.py
584 05/01/2022 07:44:00 PM INFO All apps found
585 05/01/2022 07:44:18 PM INFO Main Program complete
586 05/01/2022 07:44:19 PM INFO user Select: 6 - Add Manager to Department
587 05/01/2022 07:44:23 PM INFO User input:E05 SW
588 05/01/2022 07:44:23 PM DEBUG [#0000] C: <NEO4J POOL> routing address IPv4Address('localhost'
589 05/01/2022 07:44:23 PM DEBUG Attempting to update routing table from IPv4Address('localhost'
590 05/01/2022 07:44:23 PM DEBUG [#0000] C: <RESOLVE> localhost:7687
591 05/01/2022 07:44:23 PM DEBUG [#0000] C: <OPEN> [::1]:7687
592 05/01/2022 07:44:25 PM DEBUG [#0000] C: <ERROR> ConnectionRefusedError 10061 'No connection c
593 05/01/2022 07:44:25 PM DEBUG [#0000] C: <CLOSE> [::1]:7687
594 05/01/2022 07:44:25 PM DEBUG [#0000] C: <CONNECTION FAILED> ServiceUnavailable: Failed to est
595 05/01/2022 07:44:25 PM DEBUG Failed to fetch routing info [::1]:7687
596 05/01/2022 07:44:25 PM DEBUG [#0000] C: <OPEN> 127.0.0.1:7687
597 05/01/2022 07:44:25 PM DEBUG [#0714] C: <MAGIC> 0x60608017
598 05/01/2022 07:44:25 PM DEBUG [#0714] C: <HANDSHAKE> 0x00020404 0x00000104 0x00000004 0x0000000
599 05/01/2022 07:44:25 PM DEBUG [#0714] C: <HANDSHAKE> 0x00000404
600 05/01/2022 07:44:25 PM DEBUG [#0714] C: HELLO {'user_agent': 'neo4j-python/4.4.2 Python/3.8.8
601 05/01/2022 07:44:25 PM DEBUG [#0714] S: SUCCESS {'server': 'Neo4j/4.4.5', 'connection_id': 'b

Administrator: Command Prompt - python ProjectApp.py
Employees
-----
Menu
-----
1 - View Employees & Department
2 - View Salary Details
3 - View by Month of Birth
4 - Add New Employee
5 - View Department managed by Employee
6 - Add Manager to Department
7 - View Departments
x - Exit application
Choice: 6
Enter EID: E05
Enter DID: SW
629 05/01/2022 07:44:27 PM DEBUG [#0716] C: PULL {'n': 1000}
```

project2\$ MATCH (n) RETURN n LIMIT 25



```
ProjectApp.py X ProjectAppMySQL.py ProjectAppNeo4j.py ProjectInnovation.py requirements.txt
01_2022_Applied_Databases > Project > G00398318 > G00398318 > PythonApp > ProjectApp.py > menu
100 ProjectInnovation.clear()
101
102 # 4.4.6 6 (Add Manager to Department)
103 elif (choice == "6"):
104     logging.info('user Select: 6 - Add Manager to Department')
105     check = ""
106     while check != 1:
107         EID = input("\nEnter EID: ")
108         DEPTID = input("Enter DID: ")
109         logging.info('User input: ' + EID + ' ' + DEPTID)
110         # Function located in ProjectAppNeo4j.py
111         manaNeo = ProjectAppNeo4j.get_Neo_Results(DEPTID)
112         if manaNeo == True:
113             pass
114         else:
115             print("\nDepartment " + DEPTID + " is already managed by " + manaNeo + "\n")
116             logging.info("Department " + DEPTID + " is already managed by " + str(manaNeo))
117             ProjectInnovation.countdown()
118             # check is equal to 1 exit while loop
119             check = 1
120     logging.info("Result of manaNeo " + str(manaNeo))
121
122 # ProjectInnovation.clear()
123 # Function located in ProjectAppMySQL.py
124 dept_e = ProjectAppMySQL.view_Dept_Exists(DEPTID)
125 # print("view_Dept_Exists " + str(dept_e))
126 if dept_e == None:
127     logging.info("Department " + DEPTID + " does not exist")
128     print("Department " + DEPTID + " does not exist")
129     logging.info("view_Dept_Exists " + str(dept_e))
130
131 # Function located in ProjectAppMySQL.py
132 emp_e = ProjectAppMySQL.view_Emplo_Exists(EID)
133 # print("view_Emplo_Exists " + str(emp_e))
134 if emp_e == None:
135     logging.info("Department " + EID + " does not exist")
136     print("Department " + EID + " does not exist")
137     logging.info("view_Emplo_Exists " + str(emp_e))
138
139 # all functions must return true to be succesful.
140 if manaNeo == True and dept_e == True and emp_e == True :
141     # check is equal to 1 exit while loop
142     check = 1
143     ProjectAppNeo4j.add_manages(EID, DEPTID)
144     print("\nEmployee: ", EID, "now manages Department", DEPTID)
145     ProjectInnovation.countdown()
146     logging.info("Add Manager to Department is successful")
147
148 # Return to display menu for user
149
ProjectAppLog X
01_2022_Applied_Databases > Project > G00398318 > G00398318 > PythonApp > ProjectAppLog
742 05/01/2022 07:49:04 PM DEBUG [#0782] C: <HANDSHAKE> 0x00020404 0x00000104 0x00000004 0x0000000
743 05/01/2022 07:49:04 PM DEBUG [#0782] S: <HANDSHAKE> 0x00000404
744 05/01/2022 07:49:04 PM DEBUG [#0782] C: HELLO {'user_agent': 'neo4j-python/4.4.2 Python/3.8.8
745 05/01/2022 07:49:04 PM DEBUG [#0782] S: SUCCESS {'server': 'Neo4j/4.4.5', 'connection_id': 'b
746 05/01/2022 07:49:04 PM DEBUG [#0782] State: CONNECTED > READY
747 05/01/2022 07:49:04 PM DEBUG [#0782] C: BEGIN {'mode': 'n', 'db': 'project2'}
748 05/01/2022 07:49:04 PM DEBUG [#0782] S: SUCCESS {}
749 05/01/2022 07:49:04 PM DEBUG [#0782] State: READY > TX_READY_OR_TX_STREAMING
750 05/01/2022 07:49:04 PM DEBUG [#0782] C: RUN 'MATCH (n:Department{did:$module}) <-[:MANAGES]-()
751 05/01/2022 07:49:04 PM DEBUG [#0782] C: PULL {'n': 1000}
752 05/01/2022 07:49:04 PM DEBUG [#0782] S: SUCCESS {'t_first': 3, 'fields': ['p.eid', 'qid': 0}
753 05/01/2022 07:49:04 PM DEBUG [#0782] S: RECORD * 1
754 05/01/2022 07:49:04 PM DEBUG [#0782] S: SUCCESS {'type': 'n', 't_last': 1, 'db': 'project2'}
755 05/01/2022 07:49:04 PM DEBUG [#0782] C: COMMIT
756 05/01/2022 07:49:04 PM DEBUG [#0782] S: SUCCESS {'bookmark': 'FB:kcwQvP8oQEp4S/635a7K+nuoh8KA
757 05/01/2022 07:49:04 PM DEBUG [#0782] State: TX_READY_OR_TX_STREAMING > READY
758 05/01/2022 07:49:04 PM INFO Department SHIP1 is already managed by E01
759

Administrator: Command Prompt - python ProjectApp.py
Employees
-----
Menu
-----
1 - View Employees & Department
2 - View Salary Details
3 - View by Month of Birth
4 - Add New Employee
5 - View Department managed by Employee
6 - Add Manager to Department
7 - View Departments
x - Exit application
Choice: 6
Enter EID: E05
Enter DID: SHIP1
Department SHIP1 is already managed by E01
Clearing Data on Screen and go to Main Menu in:
6
```

Department already managed by

Employee and department does not exist

```
ProjectApp.py X ProjectAppMySQL.py ProjectAppNeo4j.py ProjectInnovation.py requirements.txt ... ProjectApp.log X
01_2022_Applied_Databases > Project > G00398318 > PythonApp > ProjectApp.py > menu
100 ProjectInnovation.clear()
101
102 # 4.4.6 6 (Add Manager to Department)
103 elif (choice == "6"):
104     logging.info('User Select: 6 - Add Manager to Department')
105     check = ""
106     while check != 1:
107         EID = input("\nEnter EID: ")
108         DEPTID = input("\nEnter DID: ")
109         logging.info('User input: ' + EID + ' ' + DEPTID)
110         # Function located in ProjectAppNeo4j.py
111         manaNeo = ProjectAppNeo4j.get_Neo_Results(DEPTID)
112         if manaNeo == true:
113             pass
114         else:
115             print("\nDepartment " + DEPTID + " is already managed by " + manaNeo + "\n")
116             logging.info("Department " + DEPTID + " is already managed by " + str(manaNeo))
117             ProjectInnovation.countdown()
118             # check is equal to 1 exit while loop
119             check = 1
120         logging.info("Result of manaNeo " + str(manaNeo))
121
122 # ProjectInnovation.clear()
123 # Function located in ProjectAppMySQL.py
124 dept_e = ProjectAppMySQL.view_Dept_Exists(DEPTID)
125 # print("view_Dept_Exists " + str(dept_e))
126 if dept_e == None:
127     logging.info("Department " + DEPTID + " does not exist")
128     print("Department " + DEPTID + " does not exist")
129     logging.info("view_Dept_Exists " + str(dept_e))
130
131 # Function located in ProjectAppMySQL.py
132 empty_e = ProjectAppMySQL.view_Emplo_Exists(EID)
133 # print("view_Emplo_Exists " + str(empty_e))
134 if empty_e == None:
135     logging.info("Department " + EID + " does not exist")
136     print("Department " + EID + " does not exist")
137     logging.info("view_Emplo_Exists " + str(empty_e))
138
139
140 # all functions must return true to be successful.
141 if manaNeo == true and dept_e == true and empty_e == true :
142     # check is equal to 1 exit while loop
143     check = 1
144     ProjectAppNeo4j.add_manages(EID, DEPTID)
145     print("\nEmployee: ", EID, "now manages Department", DEPTID)
146     ProjectInnovation.countdown()
147     logging.info("Add Manager to Department is successful")
148 # Return to display menu for user

815 05/01/2022 07:51:06 PM DEBUG [#07AF] C: PULL ['n': 1000]
816 05/01/2022 07:51:06 PM DEBUG [#07AF] S: SUCCESS {'t_first': 1, 'fields': ['p.eid'], 'qid': 0}
817 05/01/2022 07:51:06 PM DEBUG [#07AF] S: SUCCESS {'type': 'n', 't_last': 0, 'db': 'project2'}
818 05/01/2022 07:51:06 PM DEBUG [#07AF] C: COMMIT
819 05/01/2022 07:51:06 PM DEBUG [#07AF] S: SUCCESS {'bookmark': 'FB:kcwQwP8oQEp45/63Sa7K+nuoh8kA'}
820 05/01/2022 07:51:06 PM DEBUG [#07AF] State: TX_READY_OR_TX_STREAMING > READY
821 05/01/2022 07:51:06 PM INFO Result of manaNeo <function true at 0x000001E71C4A99D0>
822 05/01/2022 07:51:06 PM INFO Connect to MySql
823 05/01/2022 07:51:06 PM INFO Select did from dept
824 WHERE did = %s;
825 05/01/2022 07:51:06 PM INFO Close SQL connection for Choice 6 view_Dept_Exists
826 05/01/2022 07:51:06 PM INFO Department MANUF does not exist
827 05/01/2022 07:51:06 PM INFO view_Dept_Exists None
828 05/01/2022 07:51:06 PM INFO Connect to MySql
829 05/01/2022 07:51:06 PM INFO Select eid from employee
830 WHERE eid = %s;
831 05/01/2022 07:51:06 PM INFO Close SQL connection for Choice 6 def view_Emplo_Exists(EID):
832 05/01/2022 07:51:06 PM INFO Department E99 does not exist
833 05/01/2022 07:51:06 PM INFO view_Emplo_Exists None
834

Administrator: Command Prompt - python ProjectApp.py
Employees
-----

Menu
=====
1 - View Employees & Department
2 - View Salary Details
3 - View by Month of Birth
4 - Add New Employee
5 - View Department managed by Employee
6 - Add Manager to Department
7 - View Departments
x - Exit application
Choice: 6

Enter EID: E99
Enter DID: MANUF
Department MANUF does not exist
Department E99 does not exist

Enter EID:
```

#####

Choice 7

Table called from memory

```
ProjectApp.py x ProjectAppMySQL.py ProjectAppNeo4j.py ProjectInnovation.py requirements.txt ... ProjectAppLog x
01_2022_Applied_Databases > Project > G00398318 > PythonApp > ProjectApp.py > menu
144         check = 1
145         ProjectAppNeo4j.add_manages(EID, DEPTID)
146         print("\nEmployee: ", EID, "now manages Department", DEPTID)
147         ProjectInnovation.countdown()
148         logging.info("Add Manager to Department is successful")
149
150     # Return to display menu for user
151     ProjectInnovation.clear()
152
153     # 4.4.7 7 (View Departments)
154     elif (choice == "7"):
155         logging.info("User Select: 7 - View Departments")
156         # memory7 used for choice 7
157         # memory7 is set to 1 at beginning of menu
158         # When the user first selects choice 7 it runs the query
159         if memory7 == 1:
160             output = ProjectAppMySQL.view_Dept()
161             print("\n")
162             print(output.to_string(index=False))
163             # When choice 7 is selected memory7 is changed to 7
164             # and will not recall the query
165             logging.info("Query Sql for list of departments in choice 7")
166             memory7 = 7
167             ProjectInnovation.countdown()
168         else:
169             logging.info("Your memory has increased by a factor of " + str(memory7))
170             print("\n")
171             print(output.to_string(index=False))
172             print("\n")
173             ProjectInnovation.countdown()
174             ProjectInnovation.clear()
175
176     elif (choice == "x"):
177         logging.info("Exit Python Program")
178         logging.shutdown()
179         #sys.is_finalizing()
180         break
181
182     else:
183         # If user does not choose the correct input
184         # Print a message to the screen
185         # Returns user to main menu
186         print("\n***Please choose a number from above list or to exit press x***\n")
187         logging.info("User input error " + choice)
188         ProjectInnovation.countdown()
189         ProjectInnovation.clear()
190
191     # Displays a main menu for User
192     def display_menu():
193
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Exception ignored in: <function Driver.__del__ at 0x000002528EC634C0>
Traceback (most recent call last):
  File "C:\ProgramData\Anaconda3\lib\site-packages\neo4j\__init__.py", line 281, in __del__
  File "C:\ProgramData\Anaconda3\lib\site-packages\neo4j\__init__.py", line 311, in close
  File "C:\ProgramData\Anaconda3\lib\site-packages\neo4j\io\__init__.py", line 806, in close
  File "C:\ProgramData\Anaconda3\lib\site-packages\neo4j\io\__init__.py", line 795, in remove
  File "C:\ProgramData\Anaconda3\lib\site-packages\neo4j\io\bolt4.py", line 333, in close
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1430, in debug
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1585, in _log
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1595, in handle
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1657, in callHandlers
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 950, in handle
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1182, in emit
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1172, in _open
NameError: name 'open' is not defined
Exception ignored in: <function Bolt.__del__ at 0x000002528EC48EE0>
Traceback (most recent call last):
  File "C:\ProgramData\Anaconda3\lib\site-packages\neo4j\io\__init__.py", line 390, in __del__
  File "C:\ProgramData\Anaconda3\lib\site-packages\neo4j\io\bolt4.py", line 333, in close
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1430, in debug
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1585, in _log
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1595, in handle
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1657, in callHandlers
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 950, in handle
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1182, in emit
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1172, in _open
NameError: name 'open' is not defined
Exception ignored in: <function Bolt.__del__ at 0x000002528EC48EE0>
Traceback (most recent call last):
  File "C:\ProgramData\Anaconda3\lib\site-packages\neo4j\io\__init__.py", line 390, in __del__
  File "C:\ProgramData\Anaconda3\lib\site-packages\neo4j\io\bolt4.py", line 333, in close
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  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1585, in _log
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1595, in handle
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1657, in callHandlers
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 950, in handle
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1182, in emit
  File "C:\ProgramData\Anaconda3\lib\logging\__init__.py", line 1172, in _open
NameError: name 'open' is not defined
```