WALCHAND INSTITUTE OF TECHNOLOGY, SOLAPUR
INFORMATION TECHNOLOGY
2021-22 SEMESTER –I

Advanced Database Systems

Name: Alaikya S Yemul Roll No: 62

ASSIGNMENT NO: 1

Title: Implement Horizontal, Vertical & Mixed Fragmentation.

Theory :

Fragmentation :

Fragmentation is the task of dividing a table into a set of smaller tables these subsets of the table are called Fragments.

Fragmentation should be done in a way so that the original table can be reconstructed from the fragments whenever required this is called “re constructiveness.”

Fragmentation can be of three types: Horizontal, Vertical, and Mixed (Combination of horizontal and vertical).

1. Vertical Fragmentation:

In vertical fragmentation, the fields or columns of a table are grouped into fragments. In order to maintain reconstructiveness, each fragment should contain the primary key field(s) of the table. Vertical fragmentation can be used to enforce privacy of data.

Example:

Acc_No	Balance	Branch_Name
A_101	5000	Pune
A_102	10,000	Baroda
A_103	25,000	Delhi

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Condition:

SELECT * FROM Branch_Name

Fragmentation1:

Acc_No	Balance
A_101	5000
A_102	10,000
A_103	25,000

Fragmentation2:

Acc_No	Branch_Name
A_101	Pune
A_102	Baroda
A_103	Delhi

2. Horizontal Fragmentation:

Horizontal fragmentation groups the tuples of a table to values of one or more fields. Horizontal fragmentation should also confirm to the rule of re constructiveness. Each horizontal fragment must have all columns of the original base table.

Example: In the student schema, if the details of all students of Computer Science Course needs to be maintained at the School of Computer Science, then the designer will horizontally fragment the database as follows –

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```
CREATE COMP_STD AS
 SELECT * FROM STUDENT WHERE COURSE = "Computer Science";
```

3. Mixed Fragmentation:

Mixed fragmentation can be achieved by performing horizontal and vertical partition together.

Mixed fragmentation is group of rows and columns in relation.

Example: Consider the following table which consists of employee information.

Emp_ID	Emp_Name	Emp_Address	Emp_Age	Emp_Salary
101	Surendra	Baroda	25	15000
102	Jaya	Pune	37	12000

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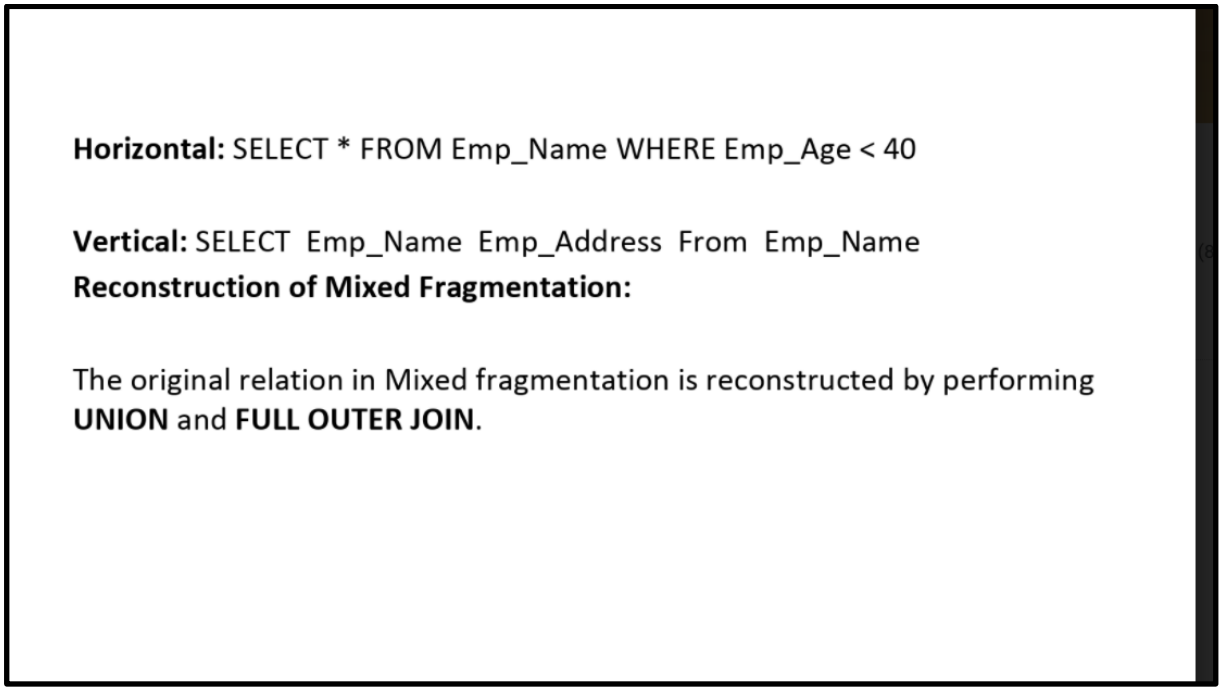

Program Code :

```
import mysql.connector
import tkinter  as tk
from tkinter import *
def vertical():
    my_w = tk.Tk()
    my_w.title("Fragment1")
    my_w.geometry("600x200")
    my_connect = mysql.connector.connect(
        host="localhost",
        user="root",
        passwd="root",
        database="student"
    )
    my_conn = my_connect.cursor()
####### end of connection ####
    my_conn.execute("SELECT Rollno,Name,Address FROM students limit 0,10")
    i=0
    for student in my_conn:
```

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```
        for j in range(len(student)):
            e = Entry(my_w, width=25, fg='blue')
            e.grid(row=i, column=j)
            e.insert(END, student[j])
        i=i+1



    my_w1 = tk.Tk()
    my_w1.title("Fragment2")
    my_w1.geometry("600x200")
    my_connect1 = mysql.connector.connect(
        host="localhost",
        user="root",
        passwd="root",
        database="student"
    )
    my_conn1 = my_connect1.cursor()
######## end of connection ####
    my_conn1.execute("SELECT Rollno,Mobileno FROM students limit 0,10")
    i=0
    for student in my_conn1:
        for j in range(len(student)):
            e = Entry(my_w1, width=25, fg='blue')
            e.grid(row=i, column=j)
            e.insert(END, student[j])
        i=i+1
    my_w1.mainloop()
    my_w.mainloop()

def horizontal():
    my_w = tk.Tk()
    my_w.title("Fragment1")
    my_w.geometry("600x200")
    my_connect = mysql.connector.connect(
        host="localhost",
        user="root",
        passwd="root",
        database="student"
    )
    my_conn = my_connect.cursor()
```

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```
####### end of connection ####
    my_conn.execute("SELECT * FROM students where Rollno<=63")
    i=0
    for student in my_conn:
        for j in range(len(student)):
            e = Entry(my_w, width=25, fg='blue')
            e.grid(row=i, column=j)
            e.insert(END, student[j])
        i=i+1



    my_w1 = tk.Tk()
    my_w1.title("Fragment2")
    my_w1.geometry("600x200")
    my_connect1 = mysql.connector.connect(
        host="localhost",
        user="root",
        passwd="root",
        database="student"
    )
    my_conn1 = my_connect1.cursor()
####### end of connection ####
    my_conn1.execute("SELECT * FROM students where Rollno>63")
    i=0
    for student in my_conn1:
        for j in range(len(student)):
            e = Entry(my_w1, width=25, fg='blue')
            e.grid(row=i, column=j)
            e.insert(END, student[j])
        i=i+1
    my_w1.mainloop()
    my_w.mainloop()

def mixed():
    my_w = tk.Tk()
    my_w.title("Horizontal")
    my_w.geometry("600x200")
    my_connect = mysql.connector.connect(
        host="localhost",
        user="root",
```

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```
        passwd="root",
        database="student"
    )
    my_conn = my_connect.cursor()
####### end of connection ####
    my_conn.execute("SELECT * FROM students WHERE Rollno<63")
    i=0
    for student in my_conn:
        for j in range(len(student)):
            e = Entry(my_w, width=25, fg='blue')
            e.grid(row=i, column=j)
            e.insert(END, student[j])
        i=i+1



    my_w1 = tk.Tk()
    my_w1.title("Mixed Table1")
    my_w1.geometry("600x200")
    my_connect1 = mysql.connector.connect(
        host="localhost",
        user="root",
        passwd="root",
        database="student"
    )
    my_conn1 = my_connect1.cursor()
####### end of connection ####
    my_conn1.execute("SELECT Rollno,Name,Address FROM students WHERE
Rollno<63")
    i=0
    for student in my_conn1:
        for j in range(len(student)):
            e = Entry(my_w1, width=25, fg='blue')
            e.grid(row=i, column=j)
            e.insert(END, student[j])
        i=i+1



    my_w2 = tk.Tk()
    my_w2.title("Mixed Table2")
```

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```
    my_w2.geometry("600x200")
    my_connect2 = mysql.connector.connect(
        host="localhost",
        user="root",
        passwd="root",
        database="student"
    )
    my_conn2 = my_connect2.cursor()
######## end of connection ####
    my_conn2.execute("SELECT Rollno,Mobileno FROM students WHERE Rollno<64")
    i=0
    for student in my_conn2:
        for j in range(len(student)):
            e = Entry(my_w2, width=25, fg='blue')
            e.grid(row=i, column=j)
            e.insert(END, student[j])
        i=i+1
    my_w2.mainloop()
    my_w1.mainloop()
    my_w.mainloop()


root = Tk()
root.title("Fragmentation")
root.geometry("580x200")
lbl = Label(root, text="Fragmentation", font=("Times New Roman Bold", 20))
lbl.grid(column=4, row=5)
lbl.configure(background="#306754")
menubar = Menu(root)
filemenu = Menu(menubar, tearoff=0)
filemenu.add_command(label="Vertical Fragmentation", command=vertical)
filemenu.add_command(label="Horizontal Fragmentation", command=horizontal)
filemenu.add_command(label="Mixed Fragmentation", command=mixed)
filemenu.add_separator()
filemenu.add_command(label="Exit", command=root.quit)
menubar.add_cascade(label="Menu", menu=filemenu)
editmenu = Menu(menubar, tearoff=0)
editmenu.add_separator()
root['bg'] = '#306754'
root.config(menu=menubar)
```

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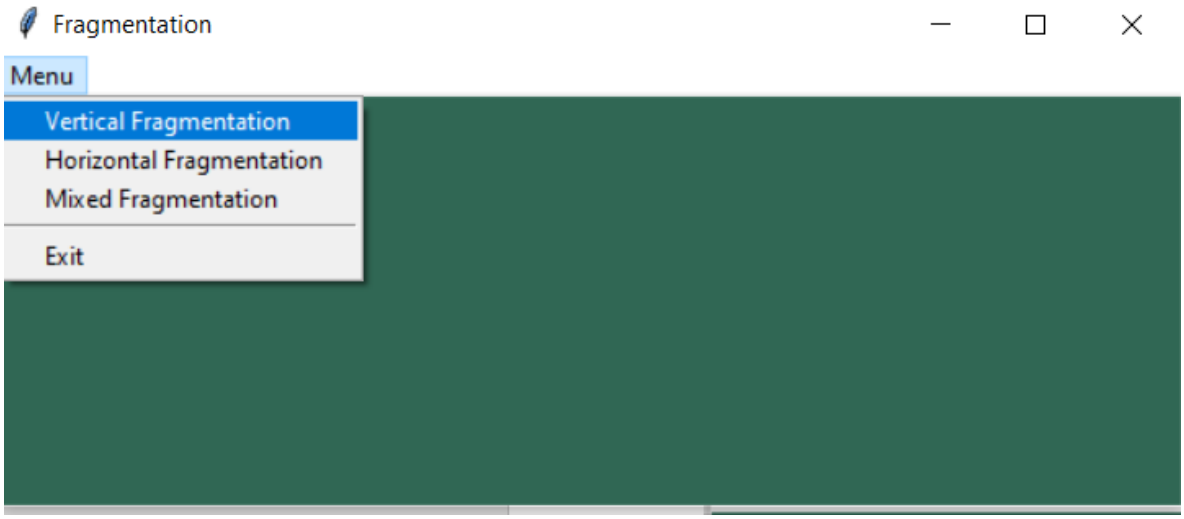
```
root.mainloop()
```

Screenshots :



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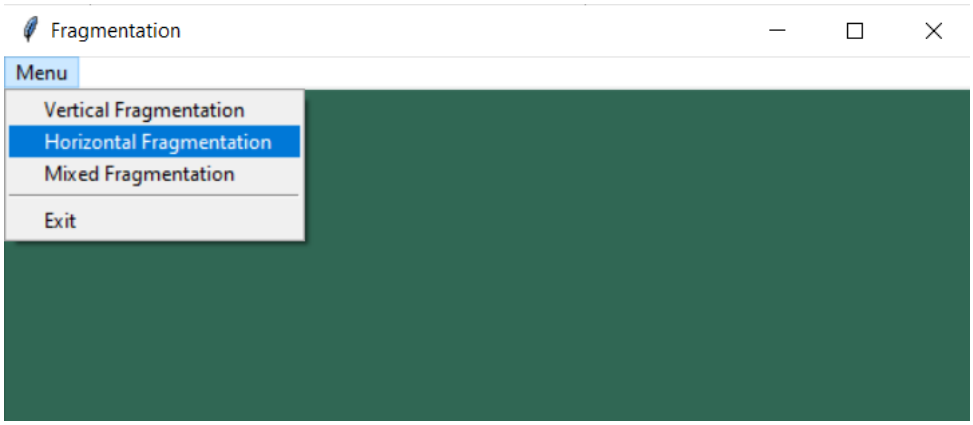

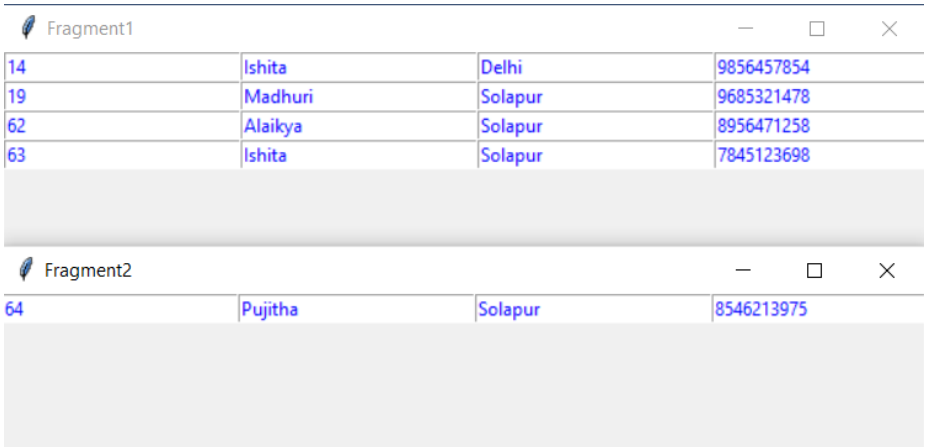

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