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Problem:

Finals Lab Task 6.

MySQL CRUD Operations in Python Using GUI Tkinter

Step 1. Make sure you install the necessary prerequisites:

a. MySQL-Connector in Pycharm

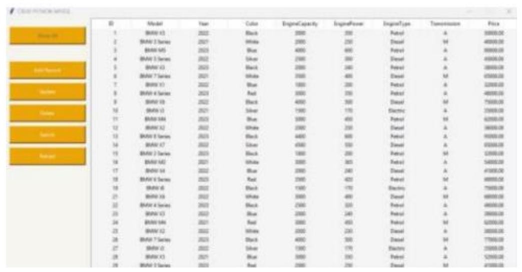
b. Activate xampp (Apache and Mysql)

c. Create a database named: cars DB

d. Import the sql file (carsDB.sql) to load the tables and records

E. Create a user named(cs204) with password (asdf123) and assign full access to the database - Use this credentials when connecting to the database

Step 2. See the GUI Design of the Demo interface



Step 3. Try the code below:

Get the copy of the following files and load in pycharm:

Link here:

https://drive.google.com/drive/folders/1e6Eh55qLAwepf0A_I8GKh70elW6jAxJj?usp=sharing

1. connectDb.py

2. main.py

3. window.py

Step 4. Run the program main.py (and test all the functions (CRUD)) it should be free from errors.

Make a screenshot of your output as proof that you were able to configure the program properly

Step 5. Add the ff: Functions in the GUI . Choose 1 only

1. Insert a Label and Text widget that will display the ff: infos:

a. the total Number of Records,

b. Car Model with the Highest Price,

c. Total Number of Manual Cars

d. Total number of and Automatic Cars

Source code:

#window.py

```
import tkinter as tk
from tkinter import font
from tkinter import ttk
from connectDB import *
from tkinter import messagebox

class Window:
    cnn = ConnectDB(host="localhost", user="cs204", password="asdf123", database="cars
db")

    def __init__(self, root):
        self.root = root
        self.settings()
        self.create_widgets()

    def settings(self):
        self.root.title("CRUD PYTHON MYSQL - BMWCars")
        self.root.resizable(0, 0)

        widthScreen = self.root.winfo_screenwidth()
        heightScreen = self.root.winfo_screenheight()
        widthWindow = 1200
        heightWindow = 600
        pwidth = int(widthScreen / 2 - widthWindow / 2)
        pheight = int(heightScreen / 2 - heightWindow / 2)
        self.root.geometry(f"{widthWindow}x{heightWindow}+{pwidth}+{pheight - 30}")

    def create_widgets(self):
        # FRAME BUTTONS
        frame1 = tk.Frame(self.root, width=200, height=600, bg="#f7f5f0")
        frame1.place(x=0, y=0)

        self.buttonInit = tk.Button(frame1, text="Show All", command=self.fnInit,
                                    width=24, height=2, background="#eba607",
                                    foreground="white")
        self.buttonInit.place(x=10, y=20)

        self.buttonNew = tk.Button(frame1, text="Add Record", command=self.InsertData,
                                   width=24, height=2, background="#eba607",
foreground="white")
        self.buttonNew.place(x=10, y=100)

        self.buttonUpdate = tk.Button(frame1, text="Update", command=self.UpdateData,
                                      width=24, height=2, background="#eba607",
foreground="white")
        self.buttonUpdate.place(x=10, y=150)

        self.buttonDelete = tk.Button(frame1, text="Delete", command=self.DeleteData,
                                      width=24, height=2, background="#eba607",
foreground="white")
        self.buttonDelete.place(x=10, y=200)

        self.buttonSearch = tk.Button(frame1, text="Search", command=self.SearchData,
                                      width=24, height=2, background="#eba607",
foreground="white")
        self.buttonSearch.place(x=10, y=250)

        self.buttonReload = tk.Button(frame1, text="Reload", command=self.fnInit,
                                      width=24, height=2, background="#eba607",
foreground="white")
        self.buttonReload.place(x=10, y=300)

        # Step 2: Show Info Button
        self.buttonTotalInfo = tk.Button(frame1, text="Car Model with the Highest Price",
command=self.show_info,
                                          width=24, height=2, background="#ff0000",
foreground="white")
        self.buttonTotalInfo.place(x=10, y=300)

        # FRAME INPUT
        self.frame2 = tk.Frame(self.root, width=300, height=600, bg="#CCCCCC")

        lbl1 = tk.Label(self.frame2, text="ID", background="#CCCCCC")
        lbl1.place(x=10, y=15)
        self.entry1 = tk.Entry(self.frame2, width=30, font=font.Font(size=12))
        self.entry1.place(x=10, y=40)

        lbl2 = tk.Label(self.frame2, text="Model:", background="#CCCCCC")
        lbl2.place(x=10, y=80)
        self.entry2 = tk.Entry(self.frame2, width=30, font=font.Font(size=12))
        self.entry2.place(x=10, y=105)

        lbl3 = tk.Label(self.frame2, text="Year Make:", background="#CCCCCC")
        lbl3.place(x=10, y=145)
        self.entry3 = tk.Entry(self.frame2, width=30, font=font.Font(size=12))
        self.entry3.place(x=10, y=170)

        lbl4 = tk.Label(self.frame2, text="Color:", background="#CCCCCC")
        lbl4.place(x=10, y=210)
        self.entry4 = tk.Entry(self.frame2, width=30, font=font.Font(size=12))
        self.entry4.place(x=10, y=235)

        lbl5 = tk.Label(self.frame2, text="Engine Capacity:", background="#CCCCCC")
        lbl5.place(x=10, y=275)
        self.entry5 = tk.Entry(self.frame2, width=30, font=font.Font(size=12))
        self.entry5.place(x=10, y=300)

        lbl6 = tk.Label(self.frame2, text="Engine Power:", background="#CCCCCC")
        lbl6.place(x=10, y=340)
        self.entry6 = tk.Entry(self.frame2, width=30, font=font.Font(size=12))
        self.entry6.place(x=10, y=365)

        lbl7 = tk.Label(self.frame2, text="Engine Type:", background="#CCCCCC")
        lbl7.place(x=10, y=405)
        self.entry7 = tk.Entry(self.frame2, width=30, font=font.Font(size=12))
        self.entry7.place(x=10, y=430)

        lbl8 = tk.Label(self.frame2, text="Transmission Type:", background="#CCCCCC")
        lbl8.place(x=10, y=470)
        self.entry8 = tk.Entry(self.frame2, width=30, font=font.Font(size=12))
        self.entry8.place(x=10, y=495)

        lbl9 = tk.Label(self.frame2, text="Price", background="#CCCCCC")
        lbl9.place(x=10, y=535)
        self.entry9 = tk.Entry(self.frame2, width=30, font=font.Font(size=12))
        self.entry9.place(x=10, y=560)

        # Frame Buttons Save and Cancel
        self.buttonSave = tk.Button(frame1, text="Save", command=self.save,
                                    width=24, height=2, background="#006400",
foreground="black")
```

```
        self.buttonCancel = tk.Button(frame1, text="Cancel", command=self.cancel,
                                      width=24, height=2, background="#8B0000",
foreground="black")

        style = ttk.Style()
        style.configure("Custom.Treeview", background="whitesmoke",
                        foreground="black")

        # Table's frame of database
        self.grid = ttk.Treeview(self.root, columns=("col1", "col2", "col3", "col4"
                                                     , "col5", "col6", "col7", "col8"),
                                 style="Custom.Treeview")
        self.grid.column("#0", width=50, anchor=tk.CENTER)
        for i in range(1, 9):
            self.grid.column(f"col{i}", width=70, anchor=tk.CENTER)

        self.grid.heading("#0", text="ID")
        self.grid.heading("col1", text="Model")
        self.grid.heading("col2", text="Year")
        self.grid.heading("col3", text="Color")
        self.grid.heading("col4", text="EngineCapacity")
        self.grid.heading("col5", text="EnginePower")
        self.grid.heading("col6", text="EngineType")
        self.grid.heading("col7", text="Transmission")
        self.grid.heading("col8", text="Price")

        self.grid.place(x=200, y=0, width=999, height=599)

    # ------------------ Step 3: Show Info ------------------
    def show_info(self):
        self.cnn.connect()
        data = self.cnn.execute_select("car")
        total_records = len(data)
        highest_price_car = max(data, key=lambda x: x[8]) if data else None
        highest_price_model = highest_price_car[1] if highest_price_car else "N/A"
        manual_count = sum(1 for row in data if row[7].upper() == "M")
        automatic_count = sum(1 for row in data if row[7].upper() == "A")
        self.cnn.disconnect()

        messagebox.showinfo("Car Info",
                            f"Car with Highest Price: {highest_price_model}\n")

    # ------------------ Existing Methods ------------------
    def fnInit(self):
        self.grid.delete(*self.grid.get_children())
        self.cnn.connect()
        data = self.cnn.execute_select("car")
        for row in data:
            self.grid.insert("", tk.END, text=row[0],
                             values=row[1:])
        self.cnn.disconnect()
        self.buttonInit.config(state="disabled")

    def cancel(self):
        self.buttonSave.place_forget()
        self.buttonCancel.place_forget()
        self.grid.place(x=200, y=0, width=999, height=599)
        self.entry1.config(state="normal")
        for entry in [self.entry1,self.entry2,self.entry3,self.entry4,
                      self.entry5,self.entry6,self.entry7,self.entry8,self.entry9]:
            entry.delete(0, "end")
        for btn in
[self.buttonUpdate,self.buttonNew,self.buttonDelete,self.buttonSearch,self.buttonReload]:
```

```python
            btn.config(state="normal")

    def save(self):
        txtid = txtmodel = txtyear = txtcolor = txttype = txttrans = ""
        txtcapacity = txtpower = 0
        txtprice = 0.0

        try:
            txtid = int(self.entry1.get())
            txtmodel = self.entry2.get()
            txtyear = self.entry3.get()
            txtcolor = self.entry4.get()
            txtcapacity = int(self.entry5.get())
            txtpower = int(self.entry6.get())
            txttype = self.entry7.get()
            txttrans = self.entry8.get()
            txtprice = float(self.entry9.get())
        except ValueError:
            messagebox.showerror("Error", "All fields must be filled correctly.")
            return
        finally:
            for entry in [self.entry1,self.entry2,self.entry3,self.entry4,
                          self.entry5,self.entry6,self.entry7,self.entry8,self.entry9]:
                entry.delete(0, "end")

        self.cnn.connect()
        if self.entry1.cget("state") == "normal":
            self.cnn.execute_insert("car", txtid, txtmodel, txtyear, txtcolor,
                                    txtcapacity, txtpower, txttype, txttrans, txtprice)
        else:
            self.cnn.execute_update("car", txtid, txtmodel, txtyear, txtcolor,
                                    txtcapacity, txtpower, txttype, txttrans, txtprice)
        self.cnn.disconnect()
        self.fnInit()
        self.buttonSave.place_forget()
        self.buttonCancel.place_forget()

        for btn in
[self.buttonUpdate,self.buttonNew,self.buttonDelete,self.buttonSearch,self.buttonReload]:
            btn.config(state="normal")
        self.entry1.config(state="normal")

    def InsertData(self):
        self.grid.place(x=500, y=0, width=699, height=599)
        self.frame2.place(x=200, y=0)
        self.buttonSave.place(x=10, y=495)
        self.buttonCancel.place(x=10, y=545)
        for btn in
[self.buttonUpdate,self.buttonNew,self.buttonDelete,self.buttonSearch,self.buttonReload]:
            btn.config(state="disabled")

    def UpdateData(self):
        selection = self.grid.selection()
        if selection:
            self.grid.place(x=500, y=0, width=699, height=599)
            self.frame2.place(x=200, y=0)
            self.buttonSave.place(x=10, y=495)
            self.buttonCancel.place(x=10, y=545)
            for btn in
[self.buttonUpdate,self.buttonNew,self.buttonDelete,self.buttonSearch,self.buttonReload]:
                btn.config(state="disabled")
            id_selectioned = self.grid.item(selection)['text']
            values = self.grid.item(selection)['values']
            if values:
                for i, entry in
enumerate([self.entry2,self.entry3,self.entry4,self.entry5,self.entry6,self.entry7,self.e
ntry8,self.entry9]):
                    entry.insert(0, values[i])
                self.entry1.insert(0, id_selectioned)
                self.entry1.config(state="disabled")
        else:
            messagebox.showerror("Error", "You must select a data")

    def DeleteData(self):
        selection = self.grid.selection()
        if selection:
            id_selectioned = self.grid.item(selection)['text']
            self.cnn.connect()
            self.cnn.execute_delete("car", id_selectioned)
            self.cnn.disconnect()
            self.fnInit()

    def SearchData(self):
        new_window = tk.Toplevel(self.root)
        new_window.title("Search")
        new_window.resizable(0, 0)
        widthScreen = self.root.winfo_screenwidth()
        heightScreen = self.root.winfo_screenheight()
        widthWindow = 700
        heightWindow = 50
        pwidth = int(widthScreen / 2 - widthWindow / 2)
        pheight = int(heightScreen / 2 - heightWindow / 2)
        new_window.geometry(f"{widthWindow}x{heightWindow}+{pwidth}+{pheight - 60}")

        def show_search_data(i, search_text):
            found_items = []
            all_items_values = []
            self.cnn.connect()
            data = self.cnn.execute_select("car")
            self.cnn.disconnect()
            all_items_values = list(data)
            for j in range(len(all_items_values)):
                if search_text.lower() == str(all_items_values[j][i]).lower():
                    found_items.append(all_items_values[j])
            self.grid.delete(*self.grid.get_children())
            for data in found_items:
                self.grid.insert('', tk.END, text=data[0], values=data[1:])
            new_window.destroy()

        def get_selected_option(search_text):
            selected_option = radio_var.get()
            if selected_option == "option1":
                show_search_data(0, search_text)
            elif selected_option == "option2":
                show_search_data(1, search_text)
            elif selected_option == "option3":
                show_search_data(2, search_text)
            elif selected_option == "option4":
                show_search_data(8, search_text)
            else:
                show_search_data(0, search_text)

        radio_var = tk.StringVar()
        ttk.Radiobutton(new_window, text="Id", variable=radio_var,
value="option1").place(x=30, y=12)
        ttk.Radiobutton(new_window, text="Model", variable=radio_var,
value="option2").place(x=80, y=12)
        ttk.Radiobutton(new_window, text="Year", variable=radio_var,
value="option3").place(x=160, y=12)
        ttk.Radiobutton(new_window, text="Price", variable=radio_var,
value="option4").place(x=240, y=12)
        entry_search = tk.Entry(new_window, width=30, font=font.Font(size=10))
        entry_search.place(x=320, y=14)
        ttk.Button(new_window, text="Get Selected Option", command=lambda:
get_selected_option(entry_search.get())).place(x=550, y=11)
```

#ConnectDB.py

```
import mysql.connector
from tkinter import messagebox

class ConnectDB:
    def __init__(self, host, user, password, database):
        self.host = host
        self.user = user
        self.password = password
        self.database = database
        self.connectDB = None

    def connect(self):
        try:
            self.connectDB = mysql.connector.connect(
                host=self.host,
                user=self.user,
                password=self.password,
                database=self.database,
                ssl_disabled=True
            )
            print("Successfully connected to the database!")
        except mysql.connector.Error as error:
            print("Something went wrong connecting to the database: ", error)

    def disconnect(self):
        if self.connectDB:
            self.connectDB.close()
            print("Successfully disconnected from the database!")

    def execute_insert(self, table, id, model, year, color, capacity, power, type,
transmission, price):
        sql = f"INSERT INTO {table}(id, model, year, color, engineCapacity, enginePower,
engineType, transmission, price) VALUES({id},'{model}', '{year}', '{color}',
{capacity},{power}, '{type}','{transmission}',{price})"
        self.commit_to_db(sql)

    def execute_delete(self, table, id):
        sql = f"DELETE FROM {table} WHERE id = {id}"
        self.commit_to_db(sql)

    def execute_update(self, table, id, model, year, color, capacity, power, engineType,
transmission, price):
        sql = f"UPDATE {table} SET model='{model}', year='{year}', color='{color}',
engineCapacity={capacity}, enginePower={power},
engineType='{engineType}',transmission='{transmission}', price={price} WHERE id={id}"
        self.commit_to_db(sql)

    def commit_to_db(self, sql):
        cursor = self.connectDB.cursor()
        try:
            cursor.execute(sql)
            self.connectDB.commit()
            print("Query successfully executed")
            messagebox.showinfo("Successfully", "Query successfully executed. Good
Work!")
        except mysql.connector.Error as error:
            self.connectDB.rollback()
            print("Error executing the query:", error)
            messagebox.showerror("Error", "Duplicate ID entry or invalid input, please
try again!")

    def execute_select(self, table):
        sql = f"SELECT * FROM {table}"
        cursor = self.connectDB.cursor()
        try:
            cursor.execute(sql)
            rows = cursor.fetchall()
            return rows
        except mysql.connector.Error as error:
            print("Error executing the query:", error)
            return []

    # Step 1: Total records method
    def get_total_records(self):
        cursor = self.connectDB.cursor()
        cursor.execute("SELECT COUNT(*) FROM car")
        result = cursor.fetchone()
        return result[0] if result else 0

    def __str__(self):
        data = self.execute_select("car")
        aux = ""
        for row in data:
            aux += str(row) + "\n"
        return aux
```

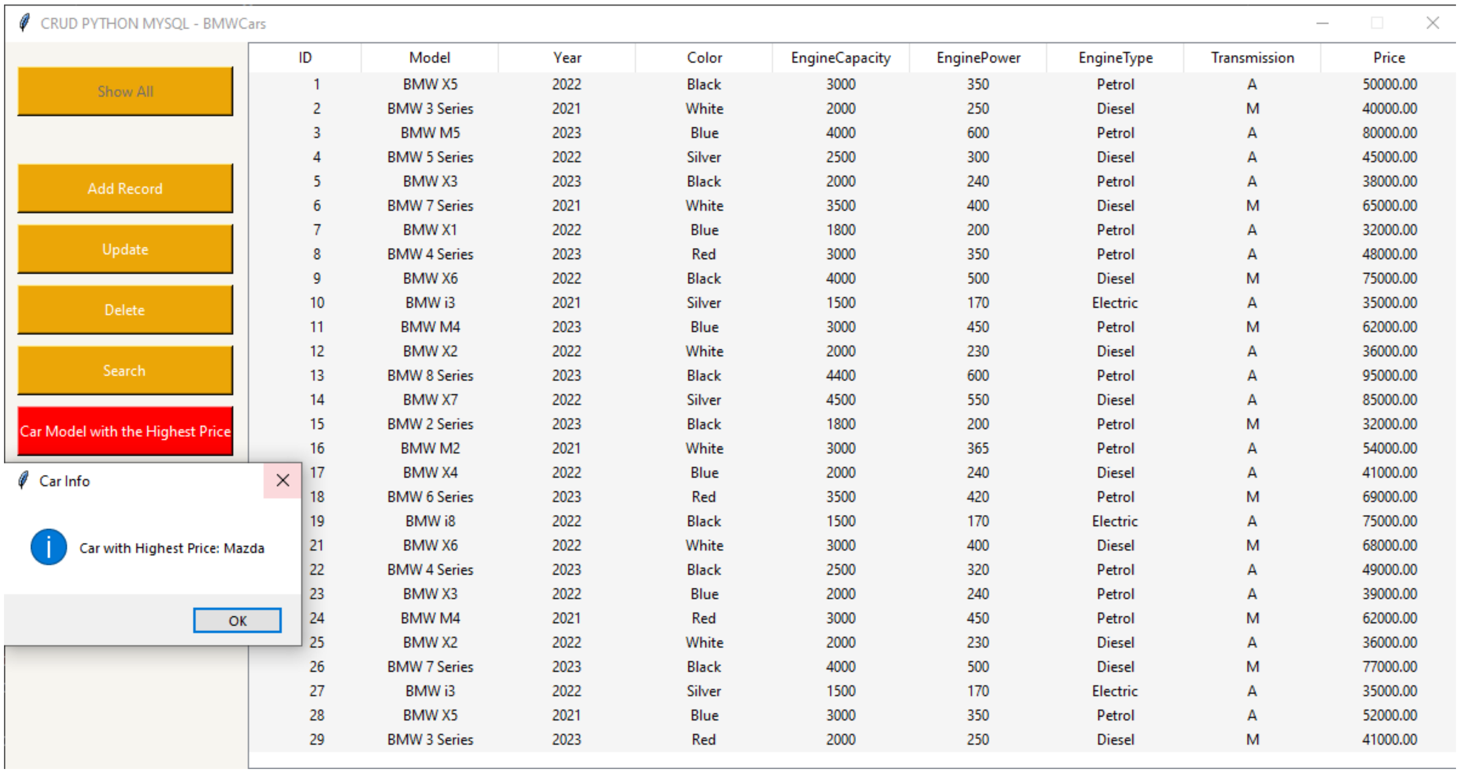
#main.py

```
import tkinter as tk
import window

def main():
    root = tk.Tk()
    crud = window.Window(root)
    root.mainloop()

if __name__ == "__main__":
    main()
```

Sample output:



Car with Highest Price: Mazda

ID	Model	Year	Color	EngineCapacity	EnginePower	EngineType	Transmission	Price
1	BMW X5	2022	Black	3000	350	Petrol	A	50000.00
2	BMW 3 Series	2021	White	2000	250	Diesel	M	40000.00
3	BMW M5	2023	Blue	4000	600	Petrol	A	80000.00
4	BMW 5 Series	2022	Silver	2500	300	Diesel	A	45000.00
5	BMW X3	2023	Black	2000	240	Petrol	A	38000.00
6	BMW 7 Series	2021	White	3500	400	Diesel	M	65000.00
7	BMW X1	2022	Blue	1800	200	Petrol	A	32000.00
8	BMW 4 Series	2023	Red	3000	350	Petrol	A	48000.00
9	BMW X6	2022	Black	4000	500	Diesel	M	75000.00
10	BMW i3	2021	Silver	1500	170	Electric	A	35000.00
11	BMW M4	2023	Blue	3000	450	Petrol	M	62000.00
12	BMW X2	2022	White	2000	230	Diesel	A	36000.00
13	BMW 8 Series	2023	Black	4400	600	Petrol	A	95000.00
14	BMW X7	2022	Silver	4500	550	Diesel	A	85000.00
15	BMW 2 Series	2023	Black	1800	200	Petrol	M	32000.00
16	BMW M2	2021	White	3000	365	Petrol	A	54000.00
17	BMW X4	2022	Blue	2000	240	Diesel	A	41000.00
18	BMW 6 Series	2023	Red	3500	420	Petrol	M	69000.00
19	BMW i8	2022	Black	1500	170	Electric	A	75000.00
21	BMW X6	2022	White	3000	400	Diesel	M	68000.00
22	BMW 4 Series	2023	Black	2500	320	Petrol	A	49000.00
23	BMW X3	2022	Blue	2000	240	Petrol	A	39000.00
24	BMW M4	2021	Red	3000	450	Petrol	M	62000.00
25	BMW X2	2022	White	2000	230	Diesel	A	36000.00
26	BMW 7 Series	2023	Black	4000	500	Diesel	M	77000.00
27	BMW i3	2022	Silver	1500	170	Electric	A	35000.00
28	BMW X5	2021	Blue	3000	350	Petrol	A	52000.00
29	BMW 3 Series	2023	Red	2000	250	Diesel	M	41000.00