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C204

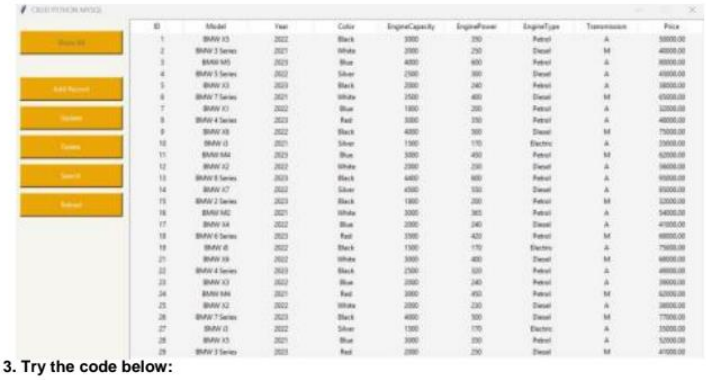
Problem:

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

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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:

Main.py

```
import tkinter as tk
import window

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

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

connectDB

```
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 connection 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 disconnecting to 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}"
        cursor = self.connectDB.cursor()
        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, 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 []

    def count_records(self, table):
        sql = f"SELECT COUNT(*) FROM {table}"
        cursor = self.connectDB.cursor()
        cursor.execute(sql)
        result = cursor.fetchone()
        return result[0]

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

window.py

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

```
from tkinter import messagebox

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

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

    def settings(self):
        self.root.title("CRUD PYTHON MYSQL - BMWCars")  # Title of the window
        self.root.resizable(0, 0)  # Disable to resizable the window

       # Size and position of the window
        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)

        # --- ADDED: LABEL FOR TOTAL RECORDS ---
        self.total_label = tk.Label(frame1, text="Total Records: 0",
                                    font=("Arial", 12, "bold"), bg="#f7f5f0")
        self.total_label.place(x=10, y=360)

        # FRAME INPUT 25 + 40
        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="Engne Motor:",
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:",
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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)
        self.grid.column("col1", width=70, anchor=tk.CENTER)
        self.grid.column("col2", width=70, anchor=tk.CENTER)
        self.grid.column("col3", width=70, anchor=tk.CENTER)
        self.grid.column("col4", width=70, anchor=tk.CENTER)
        self.grid.column("col5", width=70, anchor=tk.CENTER)
        self.grid.column("col6", width=70, anchor=tk.CENTER)
        self.grid.column("col7", width=70, anchor=tk.CENTER)
        self.grid.column("col8", 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)

    # --- ADDED FUNCTION ---
    def update_total_records(self):
        self.cnn.connect()
        total = self.cnn.count_records("car")
        self.cnn.disconnect()
        self.total_label.config(text=f"Total Records: {total}")

    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], row[2], row[3], row[4], row[5],
row[6], row[7], row[8]))
        self.cnn.disconnect()

        self.buttonInit.config(state="disabled")

        # --- UPDATE TOTAL RECORDS ---
        self.update_total_records()

    def cancel(self):
        self.buttonSave.place_forget()
        self.buttonCancel.place_forget()
        self.grid.place_forget()
        self.grid.place(x=200, y=0, width=999, height=599)
        self.entry1.config(state="normal")

        self.entry1.delete("0", "end")
        self.entry2.delete("0", "end")
        self.entry3.delete("0", "end")
        self.entry4.delete("0", "end")
        self.entry5.delete("0", "end")
        self.entry6.delete("0", "end")
        self.entry7.delete("0", "end")
        self.entry8.delete("0", "end")
        self.entry9.delete("0", "end")

        self.buttonUpdate.config(state="normal")
        self.buttonNew.config(state="normal")
        self.buttonDelete.config(state="normal")
        self.buttonSearch.config(state="normal")
        self.buttonReload.config(state="normal")

    def save(self):

        txtid = 0
        txtmodel = ""
        txtyear = ""
        txtcolor = ""
        txtcapacity = 0
        txtpower = 0
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```
        txttype = ""
        txttrans = ""
        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 as e:
            print("All fields must be filled in")
        finally:
            self.entry1.delete("0", "end")
            self.entry2.delete("0", "end")
            self.entry3.delete("0", "end")
            self.entry4.delete("0", "end")
            self.entry5.delete("0", "end")
            self.entry6.delete("0", "end")
            self.entry7.delete("0", "end")
            self.entry8.delete("0", "end")
            self.entry9.delete("0", "end")

        self.cnn.connect()

        if txtid == "" or txtmodel == "" or txtyear == "" or txtcolor == ""
or txtcapacity == "" or txtpower == "" or txttype == "" or txttrans == "" or
txtprice == "":
            messagebox.showerror("Error", "All fields must be filled in.")
        else:
            if self.entry1.cget("state") == "normal":
                self.cnn.execute_insert("car", txtid, txtmodel, txtyear,
txtcolor,
                                        txtcapacity, txtpower, txttype,
txttrans, txtprice)
            elif self.entry1.cget("state") == "disabled":
                self.cnn.execute_update("car", txtid, txtmodel, txtyear,
txtcolor,
                                        txtcapacity, txtpower, txttype,
txttrans, txtprice)

        self.cnn.disconnect()

        self.grid.delete(*self.grid.get_children())
        self.fnInit()

        # --- UPDATE TOTAL RECORDS ---
        self.update_total_records()

        self.entry1.delete("0", "end")
        self.entry2.delete("0", "end")
        self.entry3.delete("0", "end")
        self.entry4.delete("0", "end")
```

```
        self.entry5.delete("0", "end")
        self.entry6.delete("0", "end")
        self.entry7.delete("0", "end")
        self.entry8.delete("0", "end")
        self.entry9.delete("0", "end")

        self.buttonUpdate.config(state="normal")
        self.buttonNew.config(state="normal")
        self.buttonDelete.config(state="normal")
        self.buttonSearch.config(state="normal")
        self.buttonReload.config(state="normal")

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

    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)

        self.buttonUpdate.config(state="disabled")
        self.buttonNew.config(state="disabled")
        self.buttonDelete.config(state="disabled")
        self.buttonSearch.config(state="disabled")
        self.buttonReload.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)

            self.buttonUpdate.config(state="disabled")
            self.buttonNew.config(state="disabled")
            self.buttonDelete.config(state="disabled")
            self.buttonSearch.config(state="disabled")
            self.buttonReload.config(state="disabled")

            id_selectioned = self.grid.item(selection)['text']
            values = self.grid.item(selection)['values']
            if values:
                value_col_model = values[0]
                value_col_year = values[1]
                value_col_color = values[2]
                value_col_engineCapacity = values[3]
                value_col_enginePower = values[4]
                value_col_engineType = values[5]
                value_col_transmission = values[6]
                value_col_price = values[7]

                self.entry1.insert(0, id_selectioned)
```

```
                self.entry2.insert(0, value_col_model)
                self.entry3.insert(0, value_col_year)
                self.entry4.insert(0, value_col_color)
                self.entry5.insert(0, value_col_engineCapacity)
                self.entry6.insert(0, value_col_enginePower)
                self.entry7.insert(0, value_col_engineType)
                self.entry8.insert(0, value_col_transmission)
                self.entry9.insert(0, value_col_price)

                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.grid.delete(*self.grid.get_children())
            self.fnInit()

            # --- UPDATE TOTAL RECORDS ---
            self.update_total_records()

    def SearchData(self):
        new_window = tk.Toplevel(self.root)
        new_window.title("Search")
        new_window.resizable(0, 0)

        # Size and position of the window
        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")
            for row in data:
                all_items_values.append(list(row))
            self.cnn.disconnect()

            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])

            print(all_items_values)
```

```
            self.grid.delete(*self.grid.get_children())
            print(found_items)
            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 == "opcion1"):
                show_search_data(0, search_text)
            elif (selected_option == "opcion2"):
                show_search_data(1, search_text)
            elif (selected_option == "opcion3"):
                show_search_data(2, search_text)
            elif (selected_option == "opcion4"):
                show_search_data(8, search_text)
            else:
                show_search_data(0, search_text)

        style = ttk.Style()
        style.configure("TRadiobutton", font=("Helvetica", 12))
        style.configure("NoFocus.TRadiobutton",
highlightbackground=new_window.cget("background"))

        radio_var = tk.StringVar()

        radio_button1 = ttk.Radiobutton(new_window, text="Id",
variable=radio_var,
                                        value="option1",
style="NoFocus.TRadiobutton")
        radio_button1.place(x=30, y=12)

        radio_button2 = ttk.Radiobutton(new_window, text="Model",
variable=radio_var,
                                        value="option2",
style="NoFocus.TRadiobutton")
        radio_button2.place(x=80, y=12)

        radio_button3 = ttk.Radiobutton(new_window, text="Year",
variable=radio_var,
                                        value="option3",
style="NoFocus.TRadiobutton")
        radio_button3.place(x=160, y=12)

        radio_button4 = ttk.Radiobutton(new_window, text="Price",
variable=radio_var,
                                        value="option4")
        radio_button4.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)

        button_get_selected = ttk.Button(new_window, text="Get Selected
Option",
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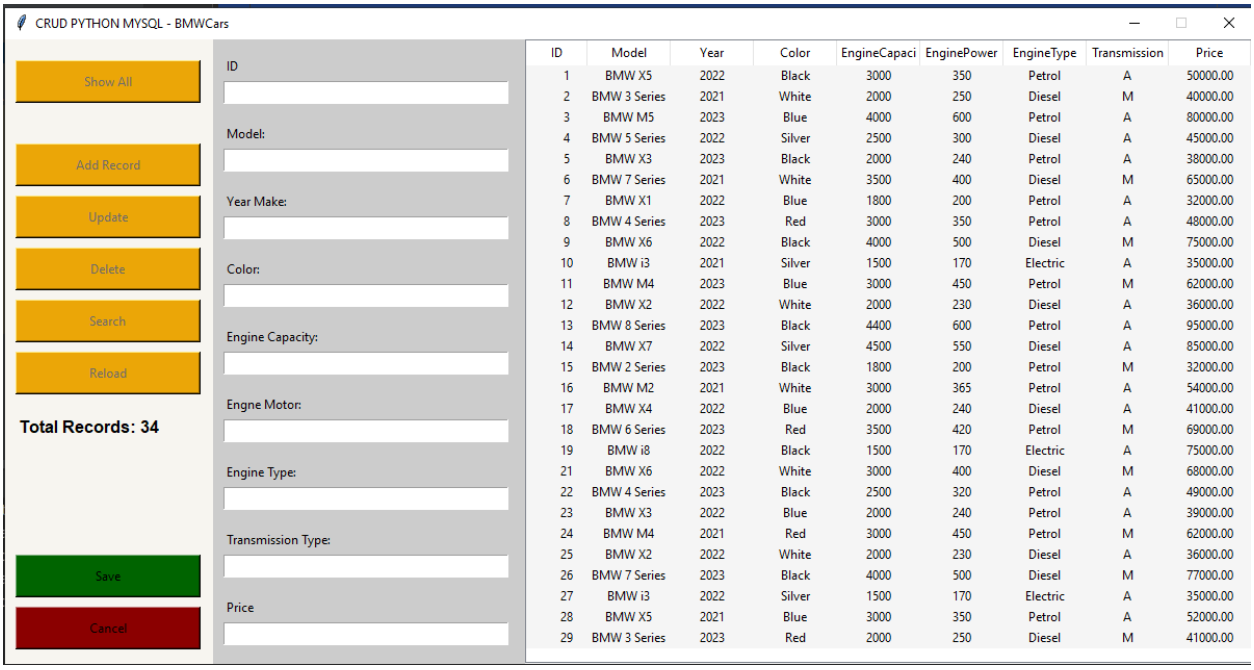
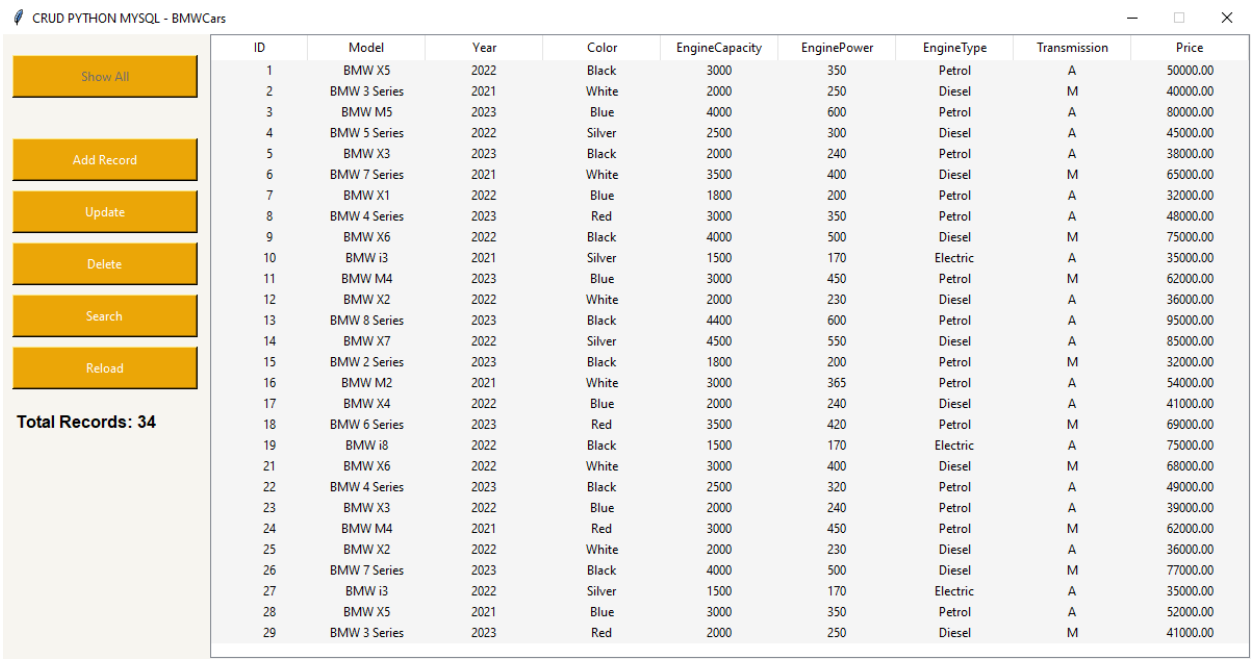
```
                                    command=lambda:
get_selected_option(entry_search.get()))
        button_get_selected.place(x=550, y=11)
```

Sample Output: