```
from tkinter import *
from tkinter import ttk

class StudentDB:
    # Used as te headers for the treeview table
    headers = ['ID', 'First Name', 'Last Name', 'Email', 'Street', 'City', 'State', 'Zip', 'Phone',
'Birth', 'Sex', 'Lunch']
    # Sample data used to test the look of the treeview
    student_info = [
    (1, 'Dale', 'Cooper', 'dcooper@aol.com','123 Main St', 'Yakima', 'WA', 98901,
'792-223-8901', '1959-2-22', 'M', 3.50),
    (2, 'Harry', 'Truman', 'htruman@aol.com', '202 South St', 'Vancouver', 'WA', 98660,
'792-223-9810', '1946-1-24','M', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50),
    (3, 'Shelly', 'Johnson', 'sjohnson@aol.com', '9 Pond Rd', 'Sparks', 'NV', 89431,
'792-223-6734', '1970-12-12','F', 3.50)
    ]

    def __init__(self):
        # Will hold all the student data in a treeview table
        self.tree = None
        self.create_widgets()

    # Initializes all of the widgets in our app
    def create_widgets(self):
        # ----- ROW 1 -----
        # Create the lable and place it in the upper left hand corner using
```

```
# the grid layout
sid_label = Label(root, text='ID')
sid_label.grid(row=0, column=0, padx=5, pady=10, sticky=W)

# Will hold the values entered into the entry widget
self.sid_entry_value = StringVar(root, value="")

# Create the entry widget and assign all values entered
# into it to the StringVar
self.sid_entry = ttk.Entry(root,
                    textvariable=self.sid_entry_value)
self.sid_entry.grid(row=0, column=1, padx=5, pady=10, sticky=W)

f_name_label = Label(root, text='First Name')
f_name_label.grid(row=0, column=2, padx=5, pady=10, sticky=W)
self.f_name_entry_value = StringVar(root, value="")
self.f_name_entry = ttk.Entry(root,
                    textvariable=self.f_name_entry_value)
self.f_name_entry.grid(row=0, column=3, padx=5, pady=10, sticky=W)

l_name_label = Label(root, text='Last Name')
l_name_label.grid(row=0, column=4, padx=5, pady=10, sticky=W)
self.l_name_entry_value = StringVar(root, value="")
self.l_name_entry = ttk.Entry(root,
                    textvariable=self.l_name_entry_value)
self.l_name_entry.grid(row=0, column=5, padx=5, pady=10, sticky=W)

email_label = Label(root, text='Email')
email_label.grid(row=0, column=6, padx=5, pady=10, sticky=W)
self.email_entry_value = StringVar(root, value="")
self.email_entry = ttk.Entry(root,
                    textvariable=self.email_entry_value)
self.email_entry.grid(row=0, column=7, padx=5, pady=10, sticky=W)

street_label = Label(root, text='Street')
street_label.grid(row=0, column=8, padx=5, pady=10, sticky=W)
self.street_entry_value = StringVar(root, value="")
self.street_entry = ttk.Entry(root,
                    textvariable=self.street_entry_value)
self.street_entry.grid(row=0, column=9, padx=5, pady=10, sticky=W)

# ----- 2nd ROW -----
city_label = Label(root, text='City')
city_label.grid(row=1, column=0, padx=5, pady=10, sticky=W)
self.city_entry_value = StringVar(root, value="")
self.city_entry = ttk.Entry(root,
                    textvariable=self.city_entry_value)
self.city_entry.grid(row=1, column=1, padx=5, pady=10, sticky=W)

state_label = Label(root, text='State')
state_label.grid(row=1, column=2, padx=5, pady=10, sticky=W)
self.state_entry_value = StringVar(root, value="")
self.state_entry = ttk.Entry(root,
                    textvariable=self.state_entry_value)
```

```
        self.state_entry.grid(row=1, column=3, padx=5, pady=10, sticky=W)

        zip_label = Label(root, text='Zip Code')
        zip_label.grid(row=1, column=4, padx=5, pady=10, sticky=W)
        self.zip_entry_value = StringVar(root, value="")
        self.zip_entry = ttk.Entry(root,
                                   textvariable=self.zip_entry_value)
        self.zip_entry.grid(row=1, column=5, padx=5, pady=10, sticky=W)

        phone_label = Label(root, text='Phone')
        phone_label.grid(row=1, column=6, padx=5, pady=10, sticky=W)
        self.phone_entry_value = StringVar(root, value="")
        self.phone_entry = ttk.Entry(root,
                                   textvariable=self.phone_entry_value)
        self.phone_entry.grid(row=1, column=7, padx=5, pady=10, sticky=W)

        birth_label = Label(root, text='Birth')
        birth_label.grid(row=1, column=8, padx=5, pady=10, sticky=W)
        self.birth_entry_value = StringVar(root, value="")
        self.birth_entry = ttk.Entry(root,
                                   textvariable=self.birth_entry_value)
        self.birth_entry.grid(row=1, column=9, padx=5, pady=10, sticky=W)

        # ----- 3RD ROW -----
        sex_label = Label(root, text='Sex')
        sex_label.grid(row=2, column=0, padx=5, pady=10, sticky=W)
        self.sex_entry_value = StringVar(root, value="")
        self.sex_entry = ttk.Entry(root,
                                   textvariable=self.sex_entry_value)
        self.sex_entry.grid(row=2, column=1, padx=5, pady=10, sticky=W)

        lunch_label = Label(root, text='Lunch')
        lunch_label.grid(row=2, column=2, padx=5, pady=10, sticky=W)
        self.lunch_entry_value = StringVar(root, value="")
        self.lunch_entry = ttk.Entry(root,
                                   textvariable=self.lunch_entry_value)
        self.lunch_entry.grid(row=2, column=3, padx=5, pady=10, sticky=W)

        # Create the button that will be used in the next video to add
        # student data to the database
        add_button = ttk.Button(root, text='Add Student', command=self.add_student)
        add_button.grid(column=4, row=2, sticky=(W, E))

        update_button = ttk.Button(root, text='Update Student', command=self.update_student)
        update_button.grid(column=5, row=2, sticky=(W, E))

        delete_button = ttk.Button(root, text='Delete Student', command=self.delete_student)
        delete_button.grid(column=6, row=2, sticky=(W, E))

        # ----- TREEVIEW -----
        # Treeviews can be used to display tables of data
        # Define the column names
        self.tree = ttk.Treeview(root, height=15, columns=('ID', 'First Name', 'Last Name', 'Email',
'Street', 'City', 'State', 'Zip', 'Phone', 'Birth', 'Sex', 'Lunch'), selectmode='browse')
```

```
        # Place the tree in the remaining space in the grid
        self.tree.grid(row=3, column=0, columnspan=17)
        # Define that we want to show the heading row
        self.tree['show'] = 'headings'

        # Assign the heading and column options
        i = 1
        for col in self.headers:
            num = f'#{i}' # Format string to produce incrementing numbers
            self.tree.heading(num, text=col)
            self.tree.column(num, width=115)
            i += 1

        # Create new treeview items and place them in the treeview
        # We get the values to add by cycling through the student
        # data list
        for stud_info in self.student_info:
            num = f'#{i}'
            self.tree.insert('', 'end', values=stud_info)
            i += 1

    def add_student(self):
        pass

    def update_student(self):
        pass

    def delete_student(self):
        pass

# Create the main window
root = Tk()
# Define the size of the main window
root.geometry("1400x600")
# Add a title to our app
root.title("Student Database")
# Create the studentDB object
student_db = StudentDB()
# Continue running our app until quit is clicked
root.mainloop()
```