INF1003F: Commercial Programming
PROJECT [100]
Due: 9th May 2024

- This is an **individual** assignment.
- Plan your project adequately, making sure you understand the requirements.
- This project enables you to apply the knowledge and skills gained in this course.
- Work on the project and submit it as a zipped file to Amathuba.

Case Study: Rondebosch Auto Centre (RAC).

RAC prides itself on meeting all of its customers' automobile needs. The centre has facilities with everything related to vehicles, including sales and leasing for new and used cars, auto service and repair, detail shop, car wash, and auto parts. RAC is looking to improve its services by automating its day-to-day activities and giving flexibility and control to its customers. Therefore, they have approached you to design and implement their Auto Centre App.

Create a Windows Forms Application about the RAC that contains **Five Forms**: The first Form is the **main Form**; The second Form should contain the purchase of vehicles, i.e. **vehicle sale Form**; the third Form is **an auto parts lookup Form,** the fourth is a **car wash Form,** and Fifth Form includes **RAC "About" information**.

1. The Main Form:

The main Form must appear when the project begins execution and should display a design of your choice the words: "Rondebosch Auto Centre - Meeting all your vehicle needs" add the appropriate image(s) and navigation to other Forms.

CONTROL STRUCTURES, METHODS AND CLASSES

2. The Second Form: Vehicle sale Form
The second Form should contain the purchase of vehicles calculations. The second Form's instructions are: **Rondebosch Auto Centre Vehicles Sales point.**

Table 1: Vehicle accessories pricing

Item	Price in Rands
Stereo System	R 5999
Leather Interior	R 29 999
Computer Navigation	R15 900
Standard	No additional charge
Pearlescent paint	R 9 999
Customized Detailing	R 12 999
Tax Rate	15%

2.1. Create a form that determines the total amount due for the purchase of a vehicle for the Rondebosch Auto Centre. Include text boxes for the base price and the trade-in allowance. Checkboxes will indicate if the buyer wants additional accessories: stereo system, leather interior, and/or computer navigation, as seen in Table 1. A group box for the exterior finish will contain radio buttons for Standard, Pearlescent, or Customized detailing. Have the trade-in amount default to zero; that is if the user does not enter a trade-in amount, use zero in your calculation. Validate the values from the text boxes, displaying a message box if necessary.

NB: Encapsulate the vehicle details in a **class** with appropriate properties and methods. Use relevant **objects** of this class in the functionality of this form.
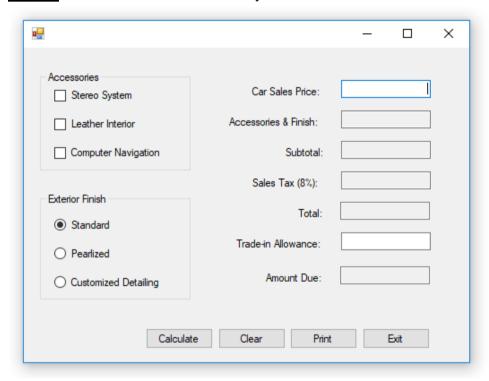
Figure 1: Vehicle Sale Form

2.2. Write a method to calculate and return the sales tax. To calculate, add the price of selected accessories and exterior finish to the base price and display the result in a control called Subtotal. Next, calculate the sales tax on the subtotal and display the result in a Total control. Then subtract any trade-in amount from the total and display the result in an Amount Due control.

2.3. Modify the example in Figure 1, using **Menus** instead of the **buttons**, adding help and information. Include Menu items for **Calculate, Clear, Print** and **Exit.** The Calculate menu item must display the total amount due after trade-in. Include navigation to the main Form.

2.4. Modify this Form instead of having its own method to calculate sales tax. In its place, to use methods and properties from a class called Calculations(). You must create this class and have it include all calculations required for RAC vehicle pricing.

2.5. Confirm the project runs and works appropriately before moving to the next step.

3. The Third Form: Auto parts Lookup Form

The third Form's instructions are: **Auto parts. Lookup Form**

3.1. RAC sells its own brand of vehicle parts. To cross-reference to major brands, it keeps a table of equivalent part numbers. RAC wants to computerize the process of looking up part numbers to improve its customer service. The user should be able to enter the part number and brand and look up the corresponding RAC part number. You may allow the user to select the brand (Brand A, Brand C, or Brand X) from a list box, combo box, or radio buttons.

3.2. You can choose from two approaches for the lookup table. Store the part numbers either in a two-dimensional array or in a parallel array structure. In either case, use the part number and brand entered by the user; look up and display the RAC part number.

Table 2: Brand equivalent parts

RAC	Brand A	Brand C	Brand X
PR214	MR43T	RBL8	14K22
PR223	R43	RJ6	14K24
PR224	R43N	RN4	14K30
PR246	R46N	RN8	14K44
PR247	R46TS	RBL17Y	14K33
PR248	R46TX	RBL12-6	14K35
PR324	S46	J11	14K38
PR326	SR46E	XEJ8	14K40
PR444	47L	H12	14K44

Figure 2: Example Auto part look up Form

4. The Fourth Form: A carwash Form

The fourth Form's instructions are: **A carwash at the "Rondebosch Auto Centre".**

4.1. The Form will contain three list box or combo box controls that do not permit users to type in items at run time. The first list will contain the names of the packages available for detailing a vehicle: Standard, Deluxe, Executive, or Luxury. The contents of the other two lists will vary depending upon the package selected.

4.2. Display one list for the interior work and one list for the exterior work. Store the descriptions of the items in string constants. You must clear the lists for the interior and exterior for each order and add new items to the lists each time the user makes a selection from the package list.

4.3. Use a drop-down list to allow the user to select the fragrance. The choices are Hawaiian Mist, Baby Powder, Pine, Country Floral, Pina Colada, and Vanilla.

4.4. Include menu items for Print Order, Clear, and Exit with appropriate access keys. The print option should send its output to the Print Preview window, you must use PrintDialog. Include your name and a heading at the top of the report.

4.5. The Order printout will contain the package name (Standard, Deluxe, Executive, or Luxury), the interior and exterior items included, and the fragrance selected. Use a loop when printing the interior and exterior lists.

	Item Description	S	D	E	L
Exterior	Hand Wash	✓	✓	✓	✓
	Hand Wax		✓	✓	✓
	Check Engine Fluids			✓	✓
	Detail Engine Compartment				✓
	Detail Undercarriage				✓
Interior	Fragrance	✓	✓	✓	✓
	Shampoo Carpets		✓	✓	✓
	Shampoo Upholstery				✓
	Interior Protection Coat (dashboard and console)			✓	
	Scotchgard™				✓

Note: S—Standard; D—Deluxe; E—Executive; L—Luxury

5. The Fifth Form

- ▪ The fifth Form contains About information regarding Rondebosch Auto Centre. Again, use images and be creative.

6. Project specifications

- ▪ This application should make use of
  - o Proper data validation and Exception handling methods
  - o data types
  - o Methods
  - o Condition expressions
  - o Control structures,
  - o Loops,
  - o Array and Collections
  - o Classes
  - o Code reuse
- ▪ Follow proper naming conventions.
- ▪ Include clear, descriptive comments.

Submission:

Folder name: INF_1003F_Project_studentNo
Deadline: 9th May 2024, 23:55pm

- ▪ Include in your submission folder *Programmer details* an MS Word document with your student's name and number. Add all assumptions that you have made about the project and any documentation details that you see fit.