LAB211 Assignment

Type:	**Long Assignment**
Code:	**J1.L.P0031**
LOC:	**500**
Slot(s):	**N/A**

Title

KOL Recruitment for Online Livestream Sales Campaign

Background

Your company has launched a strategic campaign titled "***Digital Influencers Drive Sales***" sponsored by TikTok and Shopee. To support this initiative, a program needs to be developed to manage the recruitment information of Key Opinion Leaders (KOLs).

The program should enable the marketing team to recruit and select KOLs to participate in livestream selling campaigns (a list of available KOL categories is provided in the attached KOLList.csv file). The program's main features should include:

- Allowing new KOL registrations.
- Managing recruitment data.
- Collecting and displaying statistical information related to the livestream campaigns.

Students are required to analyze and design the program using an Object-Oriented Programming (OOP) approach. The development process must incorporate OOP principles, such as abstraction, polymorphism, encapsulation, and inheritance.

Program Specifications

Develop a program to manage the recruitment information of KOLs for online livestream sales campaigns with the following functionalities:

1. **New Registration:** Add a new KOL registration.
2. **Update Registration Information:** Modify existing KOL details.
3. **Display Registered List:** Show the list of all registered KOLs.
4. **Delete Registration Information:** Remove a KOL's registration record.
5. **Search KOLs by Name:** Find registered KOLs based on their names.
6. **Filter Data by Category:** Display registrations specific to a KOL category.
7. **Statistics of Registration Numbers by Platform:** Generate statistics on the number of registrations for each social media platform.
8. **Save Data to File:** Store registration data in a file.
9. **Exit the Program:** End the program execution.

Features:

This program contains the following functions:

- ### Function 1: New registration - 50 LOC

Description:

This function allows the creation of a new KOL registration by collecting necessary details, validating inputs, and calculating the applicable commission rate.

Input Requirements:

The function requires the following KOL details:

- **KOL ID**: A unique 8-character string. The first two characters represent the category code (BT, FS, BC, GM, TL for the five KOL categories), followed by six numeric characters.
- **Name**: A non-empty string between 5 and 30 characters long.
- **Phone Number**: A 10-digit number. Must belong to a valid Vietnamese network operator.
- **Email**: A valid email address in standard format.
- **Platform Code**: A code from the list of platform codes provided in the KOLList.csv file (e.g., TK01, FB01, IG01, YT01).
- **Follower Count**: The number of followers the KOL has on their main platform.
- **Commission Rate:** Default is 20 (representing 20% of sales). KOLs with over 1 million followers are eligible for a premium rate of 25 (representing 25% of sales) due to higher influence.

Validation Rules:

1. **KOL ID:**
   - Must start with a valid category code (BT, FS, BC, GM, TL).
   - The remaining six characters must be numeric.
   - Must be unique.
2. **Name**:
   - Cannot be empty.
   - Length must be between 5 and 30 characters.
3. **Phone Number**:
   - Must contain exactly 10 digits.
   - Must belong to a valid Vietnamese network operator.
4. **Email**:
   - Must follow standard email formatting (e.g., example@domain.com).
5. **Platform Code**:
   - Must match a code from the KOLList.csv file (e.g., TK01, FB01, IG01, YT01).
6. **Follower Count**:
   - Must be a positive integer.
7. **Commission Rate Calculation:**
   - Default: 20 (representing 20% of sales).
   - Premium: 25 (representing 25% of sales) for KOLs with follower count over 1,000,000.
   - The program should store this as an integer (20 or 25) and display it with the % symbol when showing to users.

Operation Workflow:

1. Prompt the user to input KOL details.
2. Validate each input based on the rules above.

3. Calculate the commission rate based on follower count.
4. Save the registration record if all inputs are valid.
5. Return to the main menu, after adding new registration information.

▪ Function 2: Update registration information – 75 LOC

Description:

This function allows users to update the registration information of a KOL who has already registered. The information that can be updated includes:

- Name
- Phone number
- Email
- Platform Code
- Follower Count

If the KOL code entered does not exist in the registration records, the program will notify the user.

Input Requirements:

1. **KOL Code**: The unique identifier of the KOL (8 characters, as per the validation rules for registration).
2. **Fields for update:**
   a. **Name**: Must adhere to the rules of being non-empty and between 5 and 30 characters long.
   b. **Phone Number**: Must contain exactly 10 digits and belong to a Vietnamese network operator.
   c. **Email**: Must follow standard email formatting.
   d. **Platform Code**: Must be a valid code from the KOLList.csv file (e.g., TK01, FB01, IG01, YT01).
   e. **Follower Count**: Must be a positive integer.

Validation Rules:

- Apply the respective validation rules for each field being updated.
- Keep old information if no new data is entered.
- Automatically recalculate and update the Commission Rate if the Follower Count is changed (20 for under 1 million followers, 25 for 1 million followers or more).

Operation Workflow:

1. **Prompt the user to enter the KOL Code.**
2. **Check if the KOL exists in the registration records:**
   - If the KOL exists:
     - Display the current information of the KOL.
     - Prompt the user to update the desired fields (Name, Phone Number, Email, Platform Code, Follower Count).
     - Validate the inputs based on the specified rules.
     - If the Follower Count is updated, automatically recalculate the Commission Rate.

- Save the updated information.
- Display a success message.

▪ If the KOL does not exist:

- Display the message: "This KOL has not registered yet.".

3. **After handling (or lack thereof), return to the main menu.**

▪ Function 3: Display registered list – 50 LOC

Description:

This function displays a list of all KOLs who have registered for the program. If no registration data is available, the program should notify the user.

Operation Workflow:

1. **Check the Registration List:**
   ▪ Retrieve the current list of registered KOLs from the system.
2. **Display Data:**
   ▪ If the registration list contains entries:

   Display the following details for each KOL in a formatted table or list:

   - KOL ID
   - Name
   - Phone Number
   - Platform (based on the platform code and platform name in the KOLList.csv)
   - Follower Count
   - Commission Rate

   ▪ If the registration list is empty:

   Display the message: "No KOLs have registered yet."
3. **Return to Main Menu:**

   After handling, return to the main menu.

Sample Output:

Case 1: List Contains Data

```
Registered KOLs:

-------------------------------------------------------------------------
KOL ID    | Name         | Phone      | Platform | Followers  | Commission
-------------------------------------------------------------------------
BT123456  | Nguyen Van A | 0987654321 | TikTok   | 1,500,000  | 25%
FS654321  | Tran Ha Linh | 0902345678 | Facebook |   750,000  | 20%
-------------------------------------------------------------------------
```

Case 2: List is Empty

```
No KOLs have registered yet.
```

▪ Function 4: Delete registration information – 50 LOC

Description:

This function allows users to delete a registered KOL's information based on their KOL Code. If the KOL Code exists, the program will display the relevant details and ask for confirmation before proceeding with the deletion. If the KOL is not registered, an appropriate notification will be displayed.

Operation Workflow:

1. **Input the KOL Code:**
   - Prompt the user to enter the KOL Code.
2. **Check if the KOL Exists:**
   - Search the registration records for the entered KOL Code.
3. **Handle Cases:**
   - If the KOL exists:

     Display the KOL's details (e.g., Name, Phone Number, Email, Platform Code, Follower Count, Commission Rate).

     Ask the user for confirmation to delete the record:
     - If the user confirms, delete the record and display the message: "The registration has been successfully deleted."
     - If the user cancels, return to the main menu without making changes.

   - If the KOL does not exist:

     Display the message: "This KOL has not registered yet."
4. **Return to Main Menu:**
   - After handling the deletion (or lack thereof), return to the main menu.

Validation Rules:

- Ensure that the KOL Code follows the correct.
- Only delete the record if the KOL exists and the user confirms the action.

Sample Messages:

Case 1: **KOL Exists and Confirmation is Given**

```
KOL Details:
-----------------------------------------------------
KOL ID    : BT123456
Name      : Nguyen Van A
Phone     : 0987654321
Platform  : TikTok
Followers : 1,500,000
Commission: 25%
-----------------------------------------------------
Are you sure you want to delete this registration? (Y/N): Y
The registration has been successfully deleted.
```

Case 2: **KOL Does Not Exist**

```
This KOL has not registered yet.
```

▪ Function 5: Search KOLs by Name – 50 LOC

Description:

This function allows users to search for KOLs by their name. The user can enter either the full name or a partial name, and the system will display all matching KOL names. If no KOLs match the search criteria, an appropriate message will be shown.

Operation Workflow:

1. **Input the Name:**
   - Prompt the user to enter the name or partial name of the KOL they want to search for.
2. **Search Logic:**
   - Perform a search across the KOL records to find names that match the input.
     - If multiple KOLs have the same name, they should all be displayed.
     - When comparing names, uppercase and lowercase letters are not distinguished.
3. **Handle Cases:**
   - If matching KOLs are found:
     - Display the list of matching KOLs with details.
   - If no matches are found:
     - Display the message: "No one matches the search criteria!".
4. **Return to Main Menu:**
   - After displaying the results or the message, return to the main menu.

Sample Output:

Case 1: **Matching KOLs Found**

```
Matching KOLs:
-------------------------------------------------------------------------
KOL ID    | Name         | Phone      | Platform | Followers  | Commission
-------------------------------------------------------------------------
BT123456  | Nguyen Van A | 0987654321 | TikTok   | 1,500,000  | 25%
-------------------------------------------------------------------------
```

Case 2: **No Matches Found**

```
No one matches the search criteria!
```

▪ Function 6: Filter data by Category – 50 LOC

Description:

This function filters and displays a list of KOLs registered under a specific category. Users can select a category by its code, and the program will display the corresponding KOLs. If no KOLs are registered for the selected category, an appropriate message will be shown.

Category Codes and Types:

BT: Beauty
FS: Fashion
BC: Broadcasting
GM: Gaming
TL: Travel

Operation Workflow:

1. **Prompt for Category Code:**
   - Ask the user to enter a category code (e.g., BT, FS, BC, GM, TL).
2. **Filter Data:**
   - Retrieve all registered KOLs whose KOL ID begins with the entered category code.
3. **Handle Cases:**
   - If KOLs are found:

     Display the filtered list of KOLs, showing details.

   - If no KOLs are found:

     Display the message: "No KOLs have registered under this category."
4. **Return to Main Menu:**
   - After displaying the results or the message, return to the main menu.

Sample Output:

Case 1: KOLs Registered Under a Category

```
Input: BT
Registered KOLs Under Beauty Category (BT):
-------------------------------------------------------------------------
KOL ID    | Name         | Phone      | Platform | Followers  | Commission
-------------------------------------------------------------------------
BT123456  | Nguyen Van A | 0987654321 | TikTok   | 1,500,000  | 25%
BT654321  | Tran Thanh D | 0902345678 | Instagram| 750,000    | 20%
-------------------------------------------------------------------------
```

Case 2: No KOLs Registered Under a Category

```
Input: TL
No KOLs have registered under this category.
```

▪ Function 7: Statistics of registration number by Platform – 75 LOC

Description:

This function displays statistics on the number of KOLs registered for each social media platform they use. It includes details like the platform name, the number of KOLs, and the average follower count. Platforms with no registered KOLs will not be shown.

Operation Workflow:

1. **Retrieve Data:**
   - Collect all registration records to determine which platforms KOLs are using.
2. **Calculate Statistics:**
   - For each platform:
     - Count the number of KOLs.
     - Calculate the average commission rate.
   - Exclude platforms with no registered KOLs from the display.

3. **Display the Results:**
   - Show the statistics in the following format:
     - Platform Name: The name of the social media platform.
     - Number of KOLs: The count of KOLs registered on that platform.
     - Average Commission Rate: The average commission rate for KOLs on that platform (displayed with % symbol, and take only one decimal place after the floating point).
   - Ensure that only platforms with KOLs are displayed.
4. **Return to Main Menu:**
   - After displaying the statistics, return to the main menu.

Sample Output:

```
Statistics of Registration by Platform:
-----------------------------------------------------------------
Platform          | Number of KOLs | Avg. Commission Rate
-----------------------------------------------------------------
TikTok (TK01)     | 5              | 23.0%
Facebook (FB01)   | 3              | 20.0%
Instagram (IG01)  | 2              | 22.5%
YouTube (YT01)    | 4              | 21.3%
-----------------------------------------------------------------
```

▪ Function 8: Save data to registration file – 50 LOC

Description:

This function saves all the registration data to a file in an object format. This allows for persistent storage and easy retrieval of KOL registration records. The data should be saved in a structured format that preserves the relationships between KOL details and registration information.

Operation Workflow:

1. **Data Collection:**
   - Gather all current registration data from the program, including KOL details (ID, name, phone, email, platform code, follower count, and commission rate).
2. **Serialization:**
   - Convert the registration data into an object format suitable for file storage as a binary object file.
3. **Save to File:**
   - Write the serialized data to a file. The file should be named appropriately (e.g., kol_registrations.dat).
4. **Confirmation Message:**
   - Display a confirmation message once the data is successfully saved.
5. **Return to Main Menu:**
   - After saving the data, prompt the user to return to the main menu.

Sample Confirmation Message:

```
Registration data has been successfully saved to `kol_registrations.dat`.
```

- **Function 9: Exit the program – 50 LOC**

Description:

This function exits the program. The program will only exit when the user presses the designated exit key (9). If any other function key is pressed, a message will be displayed indicating that the function is not available. If the user chooses to exit without saving the data, a reminder will prompt the user to save the information before exiting.

Operation Workflow:

1. **User Input:**
   - Display a menu or prompt where the user can select a function key.
   - If the user selects function keys other than those listed on the menu:
     - Display the message: "This function is not available."
2. **Exit Confirmation:**
   - If the user selects the exit key (9):
     - If there are unsaved changes:
       - Prompt the user with the message:
       "Do you want to save the changes before exiting? (Y/N)"
         - If the user responds with 'Y':
           - Call the function to save the data to the file.
         - If the user responds with 'N':
           - Exit the program directly.
     - If there are no changes to save, exit the program immediately.
3. **Return to Main Menu:**
   - If the user selects a function key other than the exit key:
     - Display the message: "This function is not available." and remain in the program.
4. **Reminder Message:**
   - If the user exits without saving data, display a reminder message:
     You have unsaved changes. Are you sure you want to exit without saving? (Y/N)

- The above specifications **provide basic information**. You are required to ***conduct a detailed requirements analysis and build the application based on the real-world requirements***.
- The lecturer will explain the **full set of requirements only once during the initial slot of the assignment**.