

Assignment 1

Budget Management Application

Scenario:

You have been hired by a small business to create a simple **budget management application** using Dart. The application will help the business manage its monthly income and expenses. It will allow the user to input various income sources (like sales or investments) and expenses (like rent, salaries, and utilities), then calculate and display the **net profit** or **loss**.

Requirements:

1. Main Method:

The application should begin by welcoming the user and displaying a menu of options they can perform on the budget (e.g., add income, add expense, view summary, or exit).

2. Income and Expenses Management:

- The user can:
 - **Add income:** The program should prompt the user to enter the income description and amount.
 - **Add expense:** The program should prompt the user to enter the expense description and amount.
 - **View net profit or loss:** The program should calculate the total income, total expenses, and display the **net profit** (income - expenses) or **net loss** (if expenses exceed income).
 - **Exit:** The user should be able to exit the program.

3. Data Storage:

- Use **lists** to store multiple income and expense entries. Each entry should be stored as a **String** (description) and a **double** (amount).
- Example: `List<Map<String, double>> incomeList = []` and `List<Map<String, double>> expenseList = []`.

4. Input Validation:

- Ensure that the user enters valid numeric values for income and expense amounts (i.e., no negative amounts).
- Use **logical operators** to validate inputs.

5. Control Flow & Loops:

- Use **if/else statements** to handle menu options.
- Use a loop to keep asking the user for actions until they decide to exit the program.

6. String Interpolation & Operations:

- When displaying the summary of income, expenses, and net profit or loss, use **string interpolation** to clearly show amounts and messages like `"Your net profit is $5000"` or `"Your net loss is $200"`.

7. Arithmetic Operations:

- Perform calculations for total income, total expenses, and net profit or loss.

8. Exercise: Tax Calculation (Optional):

- Introduce a tax system where, at the end of the month, the business needs to pay **15%** of its net profit as tax.
- Use the ternary operator to ensure the tax is only calculated if the business is profitable. If there's a loss, no tax is calculated.
- After displaying net profit or loss, if the business made a profit, display the tax amount to be paid.

Example Output:

```
Welcome to the Budget Management Application!
Please choose an option:
1. Add income
2. Add expense
3. View summary
4. Exit

Enter your choice: 1
Enter income description: Sales
Enter income amount: 10000
Income added!

Enter your choice: 2
Enter expense description: Rent
Enter expense amount: 3000
Expense added!

Enter your choice: 3
Summary:
Total income: $10000
Total expenses: $3000
Net profit: $7000
Tax to be paid: $1050

Enter your choice: 4
Exiting the application. Goodbye!
```

Solution

```
import 'dart:io';
const String reset = '\x1B[0m';
const String pink = '\x1B[95m';
const String green = '\x1B[92m';
const String yellow = '\x1B[93m';

void main() {
  List<Map<String, double>> incomeList = [];
  List<Map<String, double>> expenseList = [];

  print('${green}Welcome to the Budget Management Application!$reset');

  while (true) {
    print('\n${pink}Please choose an option:$reset');
    print('${pink}1.$reset Add income');
    print('${pink}2.$reset Add expense');
    print('${pink}3.$reset View summary');
    print('${pink}4.$reset Exit');

    stdout.write('\n${yellow}Enter your choice:$reset ');
    String? choice = stdin.readLineSync();

    if (choice == '1') {
      stdout.write('${yellow}Enter income description:$reset ');
      String desc = stdin.readLineSync() ?? 'Unknown';
      stdout.write('${yellow}Enter income amount:$reset ');
      double? amount = double.tryParse(stdin.readLineSync() ?? '');

      if (amount != null && amount >= 0) {
        incomeList.add({desc: amount});
        print('${green}Income added!$reset');
      } else {
        print('${pink}Invalid amount! Please try again.$reset');
      }
    }

    else if (choice == '2') {
      stdout.write('${yellow}Enter expense description:$reset ');
      String desc = stdin.readLineSync() ?? 'Unknown';
      stdout.write('${yellow}Enter expense amount:$reset ');
      double? amount = double.tryParse(stdin.readLineSync() ?? '');

      if (amount != null && amount >= 0) {
        expenseList.add({desc: amount});
        print('${green}Expense added!$reset');
      } else {
        print('${pink}Invalid amount! Please try again.$reset');
      }
    }
  }
}
```

```

else if (choice == '3') {
    double totalIncome = 0;
    double totalExpenses = 0;

    for (var i in incomeList) {
        totalIncome += i.values.first;
    }
    for (var e in expenseList) {
        totalExpenses += e.values.first;
    }

    double net = totalIncome - totalExpenses;

    print("\n${green}Summary:$reset");
    print('Total income: \${totalIncome.toStringAsFixed(0)}');
    print('Total expenses: \${totalExpenses.toStringAsFixed(0)}');

    if (net > 0) {
        double tax = net * 0.15;
        print('Net profit: \${net.toStringAsFixed(0)}');
        print('Tax to be paid: \${tax.toStringAsFixed(0)}');
    } else if (net < 0) {
        print('Net loss: \${(-net).toStringAsFixed(0)}');
    } else {
        print('No profit or loss.');
```

OutPut :

```
Welcome to the Budget Management Application!
```

```
Please choose an option:
```

1. Add income
2. Add expense
3. View summary
4. Exit

```
Enter your choice: 1
```

```
Enter income description: Sales
```

```
Enter income amount: 10000
```

```
Income added!
```

```
Please choose an option:
```

1. Add income
2. Add expense
3. View summary
4. Exit

```
Enter your choice: 2
```

```
Enter expense description: Rent
```

```
Enter expense amount: 3000
```

```
Expense added!
```

```
Please choose an option:
```

1. Add income
2. Add expense
3. View summary
4. Exit

```
Enter your choice: 3
```

```
Summary:
```

```
Total income: $10000
```

```
Total expenses: $3000
```

```
Net profit: $7000
```

```
Tax to be paid: $1050
```

```
Please choose an option:
```

1. Add income
2. Add expense
3. View summary
4. Exit

```
Enter your choice: 4
```

```
Exiting the application. Goodbye!
```