Lab Report

Report No: 01

Report Title: Introduction to Dart Programming

Course Title: Mobile Application Design Lab

Course Code: CSE414

Submitted to,

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Objectives:

The objectives of this lab are:

- **To understand the basic syntax and structure of the Dart programming language.**
- **To practice the uses of the Map data structure for storing key-value pairs.**
- **To implement fundamental functions for arithmetic operations.**
- **To utilize Collection types such as Maps and Lists.**
- **To apply Object-Oriented Programming (OOP) concepts by creating Classes and Methods.**

Lab Tasks and Implementation:

Task 1: Basic Functions and Arithmetic

Problem: Create a program that defines functions for greeting a user and performing basic arithmetic operations (addition, subtraction, multiplication, division).

```
void greet(String name, String id) {
  print('Hello, $name, ID: $id');
}

int add(int a, int b) {
  return a + b;
}

int sub(int a, int b) {
  return a - b;
}
int mul(int a, int b) {
  return a * b;
}
double div(int a, int b) {
  if (b == 0) {
    throw ArgumentError('Division by zero is not allowed.');
  }
  return a / b;
}


void main(){
  greet('Sudipta Paul', '0242220005101167');
  print(add(2, 3));
}
```

Output:

```
Hello, Sudipta Paul, ID: 0242220005101167
5
```

Task 2: Working with Maps

Problem: Implement a Dart Map to store and display student information, including name, ID, role, and contact details.

```dart
void main(){
  Map<String, String> user = {
    'name': 'Sudipta Paul',
    'id': '0242220005101167',
    'role': 'student',
    'dept': 'Computer Science and Engineering',
    'faculty': 'Faculty of Science and Information Technology',
    'email': 'paul22205101167@diu.edu.bd'
  };

  print(user);
}
```

Output:

```
{name: Sudipta Paul, id: 0242220005101167, role: student, dept: Computer Science and Engineering, faculty: Faculty of Science and Information Technology, email: paul22205101167@diu.edu.bd}
```

Task 3: Modulo Operator and Logic

Problem: Create functions to calculate the remainder of division and handle user input simulation.

```dart
int remainder(int a, int b) {
  return a % b;
}
int user_input(int c) {
  return c;
}
int add (int a, int b) {
  return a + b;
}

void main(){
  print("remainder:");
  int d = remainder(10, 3);
  print(d);
  int e = user_input(1);
  print("after adding 1");
  print(add(d, e));

}
```

Output:

```
remainder:
1
after adding 1
2
```

Task 4: User Input and addition

Problem: Create a program that interacts with the user via the console to perform division and addition. The program should accept two numbers, calculate the remainder, and then accept a third number to add to that remainder.

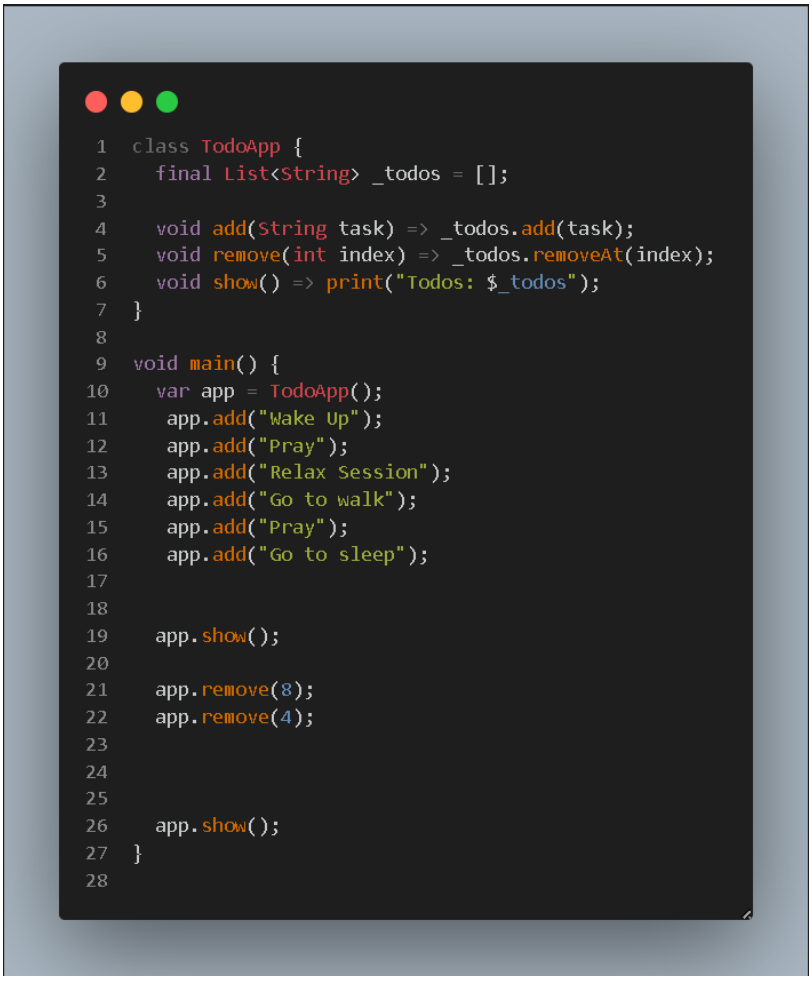
```dart
import 'dart:io';

int remainder(int a, int b) {
  return a % b;
}

void main(){
  print("Enter two numbers you want to devide");
  int a = int.parse(stdin.readLineSync()!);
  int b = int.parse(stdin.readLineSync()!);
  int c = 0;
  if (b == 0) {
    print('Division by zero is not allowed.');
  } else {
    c = remainder(a, b);
    print("Remainder: $c");
  }
  print("Enter number you want to add to the remainder: ");
  int d = int.parse(stdin.readLineSync()!);
  int e = c +d;
  print("the number: $e");
}
```

Task 5: To-Do App (Classes and Lists)

Problem: Implement a TodoApp class using a List to store tasks. The class should support adding tasks, removing specific tasks by index, and displaying the list.



```dart
class TodoApp {
  final List<String> _todos = [];

  void add(String task) => _todos.add(task);
  void remove(int index) => _todos.removeAt(index);
  void show() => print("Todos: $_todos");
}

void main() {
  var app = TodoApp();
   app.add("Wake Up");
   app.add("Pray");
   app.add("Relax Session");
   app.add("Go to walk");
   app.add("Pray");
   app.add("Go to sleep");


  app.show();

  app.remove(8);
  app.remove(4);



  app.show();
}

```

Output: Todos: [Wake Up, Pray, Relax Session, Go to walk, Pray, Go to sleep]
Todos: [Wake Up, Pray, Relax Session, Go to walk, Pray, Go to sleep]

Discussion:

In this lab, we successfully set up the Dart environment and practiced writing basic Dart code.

[Note: All codes are submitted to **GitHub** during lab sessions]

Conclusion:

This lab has prepared us for more advanced topics in mobile application development and increased our confidence in applying Dart concepts to real-world software design using Flutter and related technologies.