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Lab 02 code and comment:

Github link:

https://github.com/NK16082002/SDP-LABS/tree/main/LAB2

tutorial 2:

```
import 'package:lab2_tutorial2/lab2_tutorial2.dart' as lab2_tutorial2;

void main(List<String> arguments) {
    /*
    // Topic : Comments

    // Below Statement Is Single Line Comment
    // This Is A Comment. It Is Not Executed

    // below is a example of how we can use single line comment for multi-line comment
```

```
// over multiple lines
 // Below is an example of comment block
 // below is a example of documentation comment
/*
 // Topic : Statement and expressions
 // Example Of If Statement
 if(a>0){
 // print 42
```

```
// simple operations:
  // print 10-2=8
  // print(10 - 2);
  // print 24/3=8.0
 // Decimal Numbers:
  // print 3.142857142857143
 // Euclidean modulo operation
 // it print 8 because remainder is 8
 // print(28 % 10);
 // order of operations:
 // it print 32
 // beacause it will first calculate the expression which are in () (parenthesis)
the it evalute the value from left to right so firt 8000/50 is evaluate and its
substract 32 then he compute 29%5 and then perform ~/ between them And Give Result
 // print(((8000 / (5 * 10)) - 32) ~/ (29 % 5));
 // first it will calculate 350/5 because / has higher precedence then + so it
 // print(350 / 5 + 2);
and then divide from 350
 // print(350 / (5 + 2));
 // We Have To Import dart:math library
 // These convert an angle from degrees to radians, and then compute the sine and
cosine respectively.
 // it will take pi value as 3.14 and perform the expression and give it's sin
value
 // print(sin(45 * pi / 180));
```

```
// print(sqrt(2));
 // These compute the minimum of two numbers respectively.
 // it will first compute sqrt(2) and pi/2 and then give us max of this two
numbers
 // print the value of 1 over the square root of 2 in Dart.
// Identifiers cannot include special symbols except for underscore (_) or a dollar
sign ($).
// They must be unique.
// Identifiers cannot be keywords.
// Identifiers are case-sensitive.
// Identifiers cannot contain spaces.
// Variables :
// This Below statement declares a variable called number of type int and set the
value is 10.
// If you want to change the value of a variable, then you can just give it a
different value of the same type:
// This Below statement declares a variable called apple of type double and set the
value is 3.14159.
// double apple = 3.14159;
// This Beloe statement print true
// print(10.isEven);
// This Below statement print 3.
// print(3.14159.round());
```

```
// The num type can be either an int or a double, However, the string value 'ten'
is of a different type, so the compiler complains.
// num myNumber;
// \text{ myNumber} = 3.14159; //ok
// This lets you assign any data type you like to your variable, and the compiler
won't warn you about anything.
                               //ok
// \text{ myNumber} = 3.14159;
                               //ok
// Type inference :
// There's no need to tell Dart that 10 is an integer. Dart the type and makes
someNumber an int.
// var someNumber = 10;
// someNumber = 15; // OK
// Constants :
// const myConstant = 10;
// myConstant = 0; // Not allowed.
// final constants :
// Here is another example of a runtime value:
// If you try to change the final constant afterit's already been set, This will
produce error.
// Mini-exercises :
// 1. Declare a constant of type int called myAge and set it to your age.
// const myAge = 19;
```

```
// 2. Declare a variable of type double called averageAge.
// Initially, set the variable to your own age. Then, set it to
// double averageAge = 19;
// averageAge = 20;
// 3. Create a constant called testNumber and initialize it
// with whatever integer you'd like. Next, create another
// modulo 2. Now change testNumber to various numbers.
// const testNumber = 1025;
// const evenOdd = testNumber % 2;
// Increment and decrement :
// var counter = 0;
// In other words, the code above is shorthand for the following:
// If you only need to increment or decrement by 1, then you can use the ++ or --
operators:
// var counter = 0;
// counter--; // 0
// This given Below given operation is perform similar operations for
multiplication and division, respectively:
// double myValue = 10;
// same as myValue = myValue * 3;// myValue = 30.0;
// myValue *= 3;
// same as myValue = myValue / 2;// myValue = 15.0;
// myValue /= 2;
// Chanllanges :
// Challenge 1: Variables
// Declare a constant int called myAge and set it equal to your
// age. Also declare an int variable called dogs and set that
```

```
// equal to the number of dogs you own. Then imagine you
// bought a new puppy and increment the dogs variable by one.
// const myAge = 19;
// int dogs = 0;
// dogs++;
// print(dogs);
// Challenge 2: Make it compile
// print(age); //print : 16
// print(age); //print : 30
// Challenge 3: Compute the answer
// Consider the following code:
// const y = 10;
// Work out what each answer equals when you add the
// const answer1 = (x * 100) + y;
// const answer3 = (x * 100) + (y / 10);
// print(answer1); // 4610
// print(answer2); // 5600
// print(answer3); // 4601.0
// Challenge 4: Average rating
// Ans4 :
// const rating1 = 3.4;
// const rating2 = 4.2;
// const rating3 = 4.5;
```

Tutorial 3:

```
import 'package:lab2_tutorial3/lab2_tutorial3.dart' as lab2_tutorial3;
void main(List<String> arguments) {
 // Annotating variables explicitly :
// It's fine to always explicitly add the when you declare a variable.
// int myInteger = 10;
// double myDouble = 3.14;
// Creating constant variables :
// They're also fine with final:
// final double myDouble = 3.14;
// Checking the type at runtime
// num myNumber = 3.14;
// print(myNumber is double);
// print false
// print(myNumber is int);
// print(myNumber.runtimeType);
// Type conversion
// var integer = 100;
// A value of type 'double' can't be assigned to a variable of type 'int'.
// integer = decimal;
// Operators with mixed types
// If you actually do want an int as the result, then you need to perform the
conversion explicitly:
```

```
// The parentheses tell Dart to do the multiplication first, and after that, to
// Const variables must be initialized with a constant value.
// final totalCost = (hourlyRate * hoursWorked).toInt();
// Ensuring a certain type
// const wantADouble = 3;
// Dart infers the type of wantADouble as int. But what if you wanted the constant
to store a double instead?
// final actuallyDouble = 3.toDouble();
// Another option would be to not use type inference at all, and to add the double
annotation:
// const double actuallyDouble = 3;
// Casting down
// num someNumber = 3;
// Print false
// print(my.isEven);
// Print false
// print(someInt.isEven);
// num someNumber = 3;
// print(someNumber.isEven);
// If you do need to convert an int to a double atruntime, use the toDouble method
that you saw earlier:
// final someDouble = someNumber.toDouble();
// 1. Create a constant called age1 and set it equal to 42.
// 21. Check that the type for both constants has been
```

```
// over the variable names in VS Code.
// const age1 = 42; // int
// const age2 = 21; // int
// 2. Create a constant called averageAge and set it equal to
// averageAge to check the type. Then check the result of
// averageAge. Why is it a double if the components are
// all int?
// const averageAge = ( age1 + age2 )/2; // double
// Strings :
// Print Hello, Dart!
// print('Hello, Dart!');
// You can extract that same string as a named variable:
// var greeting = 'Hello, Dart!';
// print(greeting);
// var greeting = 'Hello, Dart!';
// you completely discarded the string 'Hello, Dart!'and replaced it with a whole
// greeting = 'Hello, Flutter!';
// print(greeting);
// Single-quotes vs. double-quotes :
// print(a);
// print I like cats
// You might want to use double-quotes, though, if your string includes any
apostrophes.
// var c = "my cat's food";
// print(c);
// Otherwise you would need to use the backslash \
// print(d);
```

```
// Concatenation :
// var message = 'Hello' + ' my name is ';
// print(message);
buffer, which is more efficient.
// message.write(' my name is ');
// message.write('Ray');
// Interpolation :
// print(name);
// this above statement print : Hello my name is Ray
// The syntax works in the same way to build a string from other data types such as
numbers:
// const sentence = 'One third is $oneThird.';
// final sentence = 'One third is ${oneThird.toStringAsFixed(3)}';
// print(sentence);
// This above statement print :One third is 0.333
// Multi-line strings :
// print(bigString);
// This above things print :
```

```
// that contains multiple
// doing this.
// const oneLine = 'This is only '
// 'a single '
// print(oneLine);
// This above things print :
// This is only a single line at runtime.
// 'a single ' +
// 'at runtime.';
// This above things print :
// This is only a single line at runtime.
// Print :
// const twoLines = 'This is\ntwo lines.';
// 1. Create a string constant called firstName and initialize it to your first
name. Also create a string constant called lastName and initialize it to your last
// const firstName = "Mit";
// const lastName = "Virani";
// 2. Create a string constant called fullName by adding the firstName and lastName
constants together, separated by a space.
// const lastName = "Virani";
// const fullName = firstName + " " + lastName;
```

```
// 3. Using interpolation, create a string constant called myDetails that uses the
fullName constant to create a string introducing yourself. For example, Ray
Wenderlich's string would read: Hello, my name is Ray Wenderlich.
// const lastName = "Virani";
// const myDetails = "Hello, my name is $firstName $lastName."; //Hello, my name is
Mit Virani.
// Object and dynamic types :
// Here is an example in JavaScript
// var myVariable = 42;
// myVariable = 123.23;
// print(myVariable);
// var answer = myVariable * 3; // runtime error
// var myVariable = 42;
// myVariable = 'hello'; // compile-time error
// dynamic myVariable = 42;
// var myVariable; // defaults to dynamic
// myVariable = 42; // OK
// myVariable = 'hello'; // OK
// print : hello
// print(myVariable);
using the Object? type.
// Object? myVariable = 42;
// myVariable = 'hello'; // OK
// print(myVariable);
// This above statement print :hello
// Challenges :
// Challenge 1: Teacher's grading
// You're a teacher, and in your class, attendance is worth 20% of the grade, the
homework is worth 30% and the exam is worth 50%. Your student got 90 points for her
attendance, 80 points for her homework and 94 points on her exam. Calculate her
grade as an integer percentage rounded down.
// final grade = ((90 * 0.20) + (80 * 0.30) + (94 * 0.50)).toInt();
```

```
// print(grade); // 89

// Challenge 2: Find the error

// What is wrong with the following code?

// const name = 'Ray';

// name += ' Wenderlich';

// Ans2 : We can't change the value of const variable after declaring it.

// Challenge 3: What type?

// What's the type of value?

// const value = 10 / 2;

// Ans3 : Double

// Challenge 6: In summary

// What is the value of the constant named summary?

// what is the value of the constant named summary?

// const number = 10;

// const multiplier = 5;

// final summary = '$number* $multiplier = ${number * multiplier}';

// Ans6 :

// print(summary); // 10 * 5 = 50

}
```

Tutorial 4:

```
import 'package:lab2_tutorial4/lab2_tutorial4.dart' as lab2_tutorial4;
void main(List<String> arguments) {
// Topic : Boolean values
// const bool no = false;
// Because of Dart's type inference, you can leave off the type annotation:
// const yes = true;
// Boolean operators :
// Testing equality :
// print(doesOneEqualTwo);
// const doesOneEqualTwo = 1 == 2;
// print(doesOneEqualTwo);
// Testing inequality :
// const doesOneNotEqualTwo = (1 != 2);
// print : true
// print(doesOneNotEqualTwo);
// print : true
// print(alsoTrue);
// Testing greater and less than :
// const isOneLessThanTwo = (1 < 2):</pre>
```

```
// print(1 <= 2); // true
// print(2 >= 1); // true
// Boolean logic :
// AND operator :
// const isSunny = true;
// const isFinished = true;
// print(willGoCycling);
// OR operator :
// const willTravelToAustralia = true;
// const canFindPhoto = false;
// const canDrawPlatypus = willTravelToAustralia || canFindPhoto;
// print(canDrawPlatypus);
// This above given statement print : true
// Print canDrawPlatypus to see that its value is true. If both values on the right
were false, then canDrawPlatypus would be false. If both were true, then
canDrawPlatypus would still be true.
// Operator precedence :
// print : andTrue
// print(andTrue);
// const and False = 1 < 2 \&\& 3 > 4;
// print : andFalse
// print(orTrue);
// print(orFalse);
// In This given below expressions precedence is comes in picture ,here \&\&
precedence is higher than | | so first (3 > 4 \& 1 < 2) is evaluated and than after
// print(false && true || true)
```

```
// Overriding precedence with parentheses :
// String equality :
// const dogEqualsCat = guess == 'cat';
// print(dogEqualsCat);
// Mini-exercises :
// 1. Create a constant called myAge and set it to your age.Then, create a constant
the age range of 13 to 19.
// const myAge = 19;
// const isTeenager = (myAge>=13 && myAge<=19);</pre>
// 2. Create another constant named maryAge and set it to 30.Then, create a
Mary are teenagers.
// const maryAge=30;
// const myAge=19;
// const bothTeenagers = (myAge>=18 && maryAge>=18);
// 3. Create a String constant named reader and set it to your name. Create another
named rayIsReader that uses string equality to determine if reader and ray are
equal.
// The if statement :
  // const animal = 'Fox';
```

```
// if (animal == 'Cat' || animal == 'Dog') {
// Else-if chains :
 // if (trafficLight == 'red') {
 // } else if (trafficLight == 'yellow') {
 // command = 'INVALID COLOR!';
// Variable scope :
 // const global = 'Hello, world';
       print(global);
 // print(global);
 // print(local);
// The ternary conditional operator :
 // print(message);
```

```
// print : You passed
// Mini-exercises :
// 1. Create a constant named myAge and initialize it with
// your age. Write an if statement to print out "Teenager"
// const myAge =19;
// if(myAge>=13 && myAge<=19)
// else
// 2. Use a ternary conditional operator to replace the else-
// if statement that you used above. Set the result to a variable named answer.
// const myAge =19;
// const message = (myAge>=13 && myAge<=19) ? 'Teenager':'Not a teenager';</pre>
// An alternate way to handle control flow, especially for multiple conditions, is
int c = 1;
 // where c is variable and which can be int,string or compile-time
constant, switch will redirect the program control to one of the case value that
follow.
   // each case keywords takes value and compare with the value using == to the
variable and we can add many cases statements and last we add default statement
     break;
     break;
   default:
```

```
// } else if (number == 2) {
 // print("Something else");
 // rewrire upper code in switch statement
 // const number1 = 3;
        break;
       break;
       break;
      print("Four");
        break:
     default:
if statements.
        break;
      case 'cloudy':
        break;
       print("I'm not familiar with that weather.");
```

```
// here cloudly case was empty with no break statements .Therefore, the code "falls
through" to the "rainy" case. this means that is they
// Enumerated types :
// Enumerated types are also known as enums, play especially well with switch
statement
// enum define our different kinds of weather.
// Create the enum as follows, placing it outside of the main function:
// enum Weather {
// when we write enum name with an intial capital letter, the value of an enum
should use LowerCamelCase unless you have a special raeson to do otherwise
// switching on enum
  // const WeatherToday = Weather.cloudy;
       break;
     case Weather.rainy:
        break;
// Enum values and indexes :
// print(weatherToday);
// print : Weather.cloudy
```