Dart Tutorial

Basic Dart Program

```
void main() {
   print("Hello World!");
}
```

Basic Dart Program Explained

- **void main() is the starting point where the execution of your program begins.**
- **Every program starts with a main function.**
- **The curly braces {} represent the beginning and the ending of a block of code.**
- **print(“Hello World!”); prints Hello World! on screen.**
- **Each code statement must end with a semicolon.**

Dart Program To Join One Or More Variables

```
void main(){
  var firstName = "John";
  var lastName = "Doe";
  print("Full name is $firstName $lastName");
}
```

Write a Dart Program for Basic Calculator (without taking input)?

Solution on next tab…

Create Full Dart Project

It's nice to work on a single file, but if your project gets bigger, you need to manage configurations, packages, and assets files. So creating a dart project will help you to manage this all.

```
dart create <project_name>
```

Steps To Create Dart Project

- Open folder location on command prompt/terminal.
- Type `dart create project_name` (For E.g. dart create first_app)
- Type `cd first_app`
- Type `code .` to open project with visual studio code
- To check the main dart file go to bin/first_app.dart and edit your code.

Run Dart Project

First, open the project location on the command/terminal and run the project with this command.

```
dart run
```

Convert Dart Code To Javascript

Command	**Description**
dart compile js filename.dart	Compile dart to javascript. You can run this file with Node.js.

Challenge

Create a new dart project with name stockmanagement and then run it.

Variables

Variables are containers used to store value in the program. There are different types of variables where you can keep different kinds of values. Here is an example of creating a variable and initializing it.

```
// here variable name contains value John.
var name = "John";
```

Variable Types

They are called data types. We will learn more about data types later in this dart tutorial.

- **String: For storing text value. E.g. “John” [Must be in quotes]**
- **int: For storing integer value. E.g. 10, -10, 8555 [Decimal is not included]**
- **double: For storing floating point values. E.g. 10.0, -10.2, 85.698 [Decimal is included]**
- **num: For storing any type of number. E.g. 10, 20.2, -20 [both int and double]**
- **bool: For storing true or false. E.g. true, false [Only stores true or false values]**
- **var: For storing any value. E.g. ‘Bimal’, 12, ‘z’, true**

Syntax

This is syntax for creating a variable in dart.

```
type variableName = value;
```

Rules For Creating Variables In Dart

- **Variable names are case sensitive, i.e., a and A are different.**
- **A variable name can consist of letters and alphabets.**
- **A variable name cannot start with a number.**
- **Keywords are not allowed to be used as a variable name.**
- **Blank spaces are not allowed in a variable name.**
- **Special characters are not allowed except for the underscore (_) and the dollar ($) sign.**

Example 1: Using Variables In Dart

In this example, you will learn how to declare variables and print their values.

```
void main() {
// declaring variables
String name = "John";
String address = "USA";
num age = 20; // used to store any types of numbers
num height = 5.9;
bool isMarried = false;

// printing variables value
print("Name is $name");
print("Address is $address");
print("Age is $age");
print("Height is $height");
print("Married Status is $isMarried");
}
```

Dart Constant

Constant is the type of variable whose value never changes. In programming, changeable values are mutable and unchangeable values are immutable. Sometimes, you don't need to change the value once declared. Like the value of PI=3.14, it never changes. To create a constant in Dart, you can use the const keyword.

```
void main(){
const pi = 3.14;
pi = 4.23; // not possible
print("Value of PI is $pi");
}
```

Naming Convention For Variables In Dart

It is a good habit to follow the naming convention. In Dart Variables, the variable name should start with lower-case, and every second word's first letter will be upper-case like num1, fullName, isMarried, etc. Technically, this naming convention is called **lowerCamelCase**.

```
// Not standard way
var fullname = "John Doe";
// Standard way
var fullName = "John Doe";
const pi = 3.14;
```

Data Types

Data types help you to categorize all the different types of data you use in your code. For e.g. numbers, texts, symbols, etc. The data type specifies what type of value will be stored by the variable. Each variable has its data type. Dart supports the following built-in data types :

1. Numbers
2. Strings
3. Booleans
4. Lists
5. Maps
6. Sets
7. Runes
8. Null

Built-In Types

In Dart language, there is the type of values that can be represented and manipulated. The data type classification is as given below:

Data Type	**Keyword**	**Description**
Numbers	int, double, num	It represents numeric values
Strings	String	It represents a sequence of characters
Booleans	bool	It represents Boolean values true and false
Lists	List	It is an ordered group of items
Maps	Map	It represents a set of values as key-value pairs
Sets	Set	It is an unordered list of unique values of same types

Runes	runes	It represents Unicode values of String
Null	null	It represents null value

Numbers

When you need to store numeric value on dart, you can use either int or double. Both int and double are subtypes of num. You can use num to store both int or double value.

```
void main() {
// Declaring Variables
int num1 = 100; // without decimal point.
double num2 = 130.2; // with decimal point.
num num3 = 50;
num  num4 = 50.4;

// For Sum
num sum = num1 + num2 + num3 + num4;

// Printing Info
print("Num 1 is $num1");
print("Num 2 is $num2");
print("Num 3 is $num3");
print("Num 4 is $num4");
print("Sum is $sum");

}
```

Round Double Value To 2 Decimal Places

```
void main() {
// Declaring Variables
double price = 1130.2232323233233; // valid.
print(price.toStringAsFixed(2));
}
```

String

String helps you to store text data. You can store values like I love dart, New York 2140 in String. You can use single or double quotes to store string in dart.

```
void main() {
// Declaring Values
String schoolName = "Diamond School";
String address = "New York 2140";

// Printing Values
print("School name is $schoolName and address is $address");
}
```

Create A Multi-Line String In Dart

If you want to create a multi-line String in dart, then you can use triple quotes with either single or double quotation marks.

```
void main() {
// Multi Line Using Single Quotes
String multiLineText = '''
This is Multi Line Text
with 3 single quote
I am also writing here.
''';

// Multi Line Using Double Quotes
String otherMultiLineText = """
This is Multi Line Text
with 3 double quote
I am also writing here.
""";

// Printing Information
print("Multiline text is $multiLineText");
print("Other multiline text is $otherMultiLineText");
}
```

Special Character In String

Special Character	Work
\n	New Line
\t	Tab

```
void main() {

// Using \n and \t
print("I am from \nUS.");
print("I am from \tUS.");
}
```

Create A Raw String In Dart

You can also create raw string in dart. Special characters won't work here. You must write r after equal sign.

```
void main() {
// Set price value
num price = 10;
String withoutRawString = "The value of price is \t $price"; // regular String
String withRawString =r"The value of price is \t $price"; // raw String

print("Without Raw: $withoutRawString"); // regular result
print("With Raw: $withRawString"); // with raw result

}
```

Type Conversion In Dart

In dart, type conversion allows you to convert one data type to another type. For e.g. to convert String to int, int to String or String to bool, etc.

Convert String To Int In Dart

You can convert String to int using int.parse() method. The method takes String as an argument and converts it into an integer.

```
void main() {
String strvalue = "1";
print("Type of strvalue is ${strvalue.runtimeType}");
int intvalue = int.parse(strvalue);
print("Value of intvalue is $intvalue");
// this will print data type
print("Type of intvalue is ${intvalue.runtimeType}");
}
```

Convert String To Double In Dart

You can convert String to double using double.parse() method. The method takes String as an argument and converts it into a double.

```
void main() {
String strvalue = "1.1";
print("Type of strvalue is ${strvalue.runtimeType}");
double doublevalue = double.parse(strvalue);
print("Value of doublevalue is $doublevalue");
// this will print data type
print("Type of doublevalue is ${doublevalue.runtimeType}");
}
```

Convert Int To String In Dart

You can convert int to String using the toString() method. Here is example:

```
void main() {
int one = 1;
print("Type of one is ${one.runtimeType}");
String oneInString = one.toString();
print("Value of oneInString is $oneInString");
// this will print data type
print("Type of oneInString is ${oneInString.runtimeType}");
}
```

Convert Double To Int In Dart

You can convert double to int using the toInt() method.

```
void main() {
   double num1 = 10.01;
   int num2 = num1.toInt(); // converting double to int

  print("The value of num1 is $num1. Its type is ${num1.runtimeType}");
  print("The value of num2 is $num2. Its type is ${num2.runtimeType}");
}
```

Booleans

In Dart, boolean holds either true or false value. You can write the bool keyword to define the boolean data type. You can use boolean if the answer is true or false. Consider the answer to the following questions:

- Are you married?
- Is the door open?
- Does a cat fly?
- Is the traffic light green?
- Are you older than your father?

```
void main() {
bool isMarried = true;
print("Married Status: $isMarried");
}
```

Lists

The list holds multiple values in a single variable. It is also called arrays. If you want to store multiple values without creating multiple variables, you can use a list.

```
void main() {
List<String> names = ["Raj", "John", "Max"];
print("Value of names is $names");
print("Value of names[0] is ${names[0]}"); // index 0
print("Value of names[1] is ${names[1]}"); // index 1
print("Value of names[2] is ${names[2]}"); // index 2

  // Finding Length of List
int length = names.length;
print("The Length of names is $length");
}
```

Note: List index always starts with 0. Here names[0] is Raj, names[1] is John and names[2] is Max.

Sets

An unordered collection of unique items is called set in dart. You can store unique data in sets.

Note: Set doesn't print duplicate items.

```
void main() {
Set<String> weekday = {"Sun", "Mon", "Tue", "Wed", "Thu", "Fri", "Sat"};
print(weekday);
}
```

Maps

In Dart, a map is an object where you can store data in key-value pairs. Each key occurs only once, but you can use same value multiple times.

```
void main() {
Map<String, String> myDetails = {
   'name': 'John Doe',
   'address': 'USA',
   'fathername': 'Soe Doe'
};
// displaying the output
print(myDetails['name']);
}
```

Var Keyword In Dart

In Dart, var automatically finds a data type. In simple terms, var says if you don't want to specify a data type, I will find a data type for you.

```
void main(){

var name = "John Doe"; // String
var age = 20; // int

print(name);
print(age);
}
```

Runes In Dart

With runes, you can find Unicode values of String. The Unicode value of a is 97, so runes give 97 as output.

```
void main() {

String value = "a";
print(value.runes);
}
```

How To Check Runtime Type

You can check runtime type in dart with `.runtimeType` after the variable name.

```
void main() {
   var a = 10;
   print(a.runtimeType);
   print(a is int); // true
}
```

Optionally Typed Language

You may have heard of the statically-typed language. It means the data type of variables is known at compile time. Similarly, dynamically-typed language means data types of variables are known at run time. Dart supports dynamic and static types, so it is called optionally-typed language.

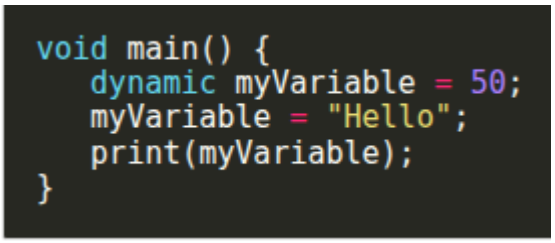
Statically Typed

A language is statically typed if the data type of variables is known at compile time. Its main advantage is that the compiler can quickly check the issues and detect bugs.

```
void main() {
   var myVariable = 50; // You can also use int instead of var
   myVariable = "Hello"; // this will give error
   print(myVariable);
}
```

Dynamically Typed Example

A language is dynamically typed if the data type of variables is known at run time.



Note: Using static type helps you to prevent writing silly mistakes in code. It's a good habit to use static type in dart.

Solutions

Dart Program for Basic Calculator (without taking Input)

```dart
void main() {
int num1 = 10; //declaring number1
int num2 = 3; //declaring number2

// Calculation
int sum = num1 + num2;
int diff = num1 - num2;
int mul = num1 * num2;
double div = num1 / num2; // It is double because it outputs number with decimal.

// displaying the output
print("The sum is $sum");
print("The diff is $diff");
print("The mul is $mul");
print("The div is $div");
}
```

Challenge

Create a new dart project with name stockmanagement and then run it.

dart create stockmanagement
dart run