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Mata Kuliah : Mobile Programming 1
Soal : Program Dasar Dart ke 3



Link github : <https://github.com/agungsaputro794/Mobile-Programming.git>

Praktikum 1: experiment tipe data list

Langkah pertama

```
lib > testing.dart > ...
Run | Debug | Profile
1 void main() {
2   var list = [1, 2, 3];
3   assert(list.length == 3);
4   assert(list[1] == 2);
5   print(list.length);
6   print(list[1]);
7
8   list[1] = 1;
9   assert(list[1] == 1);
10  print(list[1]);
11 }
12
13
```

PROBLEMS 3 OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS D:\MobileProgramming\latihan> cd lib
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
3
2
1
PS D:\MobileProgramming\latihan\lib>
```

Langkah kedua

Yang terjadi adalah menghitung mundur angkanya dari ke 3 ke 1

Langkah ketiga

```
lib > testing.dart > main
Run | Debug | Profile
1 void main() {
2   final List<String?> list = List.filled(5, null);
3
4   list[1] = "Agung";
5   list[2] = "0998736541";
6
7   print(list);
8 }
9
10
```

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
List<dynamic>
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
List<dynamic>
PS D:\MobileProgramming\latihan\lib> run dart testing.dart
run : The term 'run' is not recognized as the name of a cmdlet, function, script file, or operable program. Check the spelling of the
name, or if a path was included, verify that the path is correct and try again.
At line:1 char:1
+ run dart testing.dart
+ ~~~~~
+ CategoryInfo          : ObjectNotFound: (run:String) [], CommandNotFoundException
+ FullyQualifiedErrorId : CommandNotFoundException

PS D:\MobileProgramming\latihan\lib> dart run testing.dart
List<dynamic>
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
[null, Agung, 0998736541, null, null]
PS D:\MobileProgramming\latihan\lib>
```

Praktikum 2: experiment tipe data set

Langkah pertama

```
lib > testing.dart > main
Run | Debug | Profile
1 void main() {
2
3   var halogens = {'fluorine', 'chlorine', 'bromine', 'iodine', 'astatine'};
4   print(halogens);
5 }
6
7
```

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS D:\MobileProgramming\latihan> cd lib
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
{fluorine, chlorine, bromine, iodine, astatine}
PS D:\MobileProgramming\latihan\lib>
```

Langkah kedua

Menampilkan nama dan mengurutkan nama yang sudah di list

Langkah ketiga

```
lib > testing.dart > main
3 void main() {
4
5   var gifts = {
6     'first' : 'partridge',
7     'second' : 'turtledoves',
8     'fifth' : 'golden rings'
9   };
10
11   var nobleGases = {
12     2: 'helium',
13     10: 'neon',
14     18: 'argon',
15   };
16
17   print("Gifts: $gifts");
18   print("Noble Gases: $nobleGases");
19
20   var mhs1 = <String, String>{};
21   mhs1['nama'] = 'Agung';
22   mhs1['NIM'] = '230444040019';
23
24   var mhs2 = <String, String>{};
25   mhs2['nama'] = 'Evan';
26   mhs2['NIM'] = '230444040020';
27
28   print("Mahasiswa 1: $mhs1");
29   print("Mahasiswa 2: $mhs2");
30 }

PROBLEMS 4 OUTPUT DEBUG CONSOLE TERMINAL PORTS
Mahasiswa 1: {nama: Agung, NIM: 230444040019}
Mahasiswa 2: {nama: Evan, NIM: 230444040020}
PS D:\MobileProgramming\latihan\lib>
```

Praktikum 3: Experiment tipe data maps

Langkah pertama

```
3 void main() {
4
5   var gifts = {
6     'first' : 'partridge',
7     'second' : 'turtledoves',
8     'fifth' : 1
9   };
10
11   var nobleGases = {
12     2: 'helium',
13     10: 'neon',
14     18: 2,
15   };
16
17   print(gifts);
18   print(nobleGases);
19
20 }
```

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
Mahasiswa 2: {nama: Evan, NIM: 230444040020}
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
{first: partridge, second: turtledoves, fifth: 1}
{2: helium, 10: neon, 18: 2}
PS D:\MobileProgramming\latihan\lib>
```

Langkah kedua

Menampilkan secara berurutan dan tersusun sesuai keinginan kita

Langkah ketiga

```
lib > testing.dart > main
1 void main() {
4
5   var nama1 = <String>{};
6   Set<String> nama2 = {};
7
8   Don't invoke 'print' in production code.
9   Try using a logging framework. dart(avoid_print)
10  View Problem (Alt+F8) Quick Fix (Ctrl+)
11  print("(Nama Kosong): $nama3");
12
13  nama1.add("Agung");
14  nama1.add("230444040019");
15  nama2.addAll({"Evan", "230444040019"});
16  nama3.addAll({"Jawir", "230444040078"});
17
18  print("setelah ditambah: $nama1");
19  print("setelah ditambah: $nama2");

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
{first: partridge, second: turtledoves, fifth: 1}
{2: helium, 10: neon, 18: 2}
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
Halogens: {fluorine, chlorine, bromine, iodine, astatine}
(Nama Kosong): {}
(Nama Kosong): {}
(Nama Kosong): {}
setelah ditambah: {Agung, 230444040019}
setelah ditambah: {Evan, 230444040019}
setelah ditambah: {Jawir, 230444040078}
PS D:\MobileProgramming\latihan\lib>
```

Praktikum 4 : Eksperimen tipe data list: spread dan control-flow operators

Langkah pertama

Sebelum

```
lib > testing.dart > main
Run | Debug | Profile
1 void main() {
2   var list = [1, 2, 3];
3   var list2 = [0, ...list];
4
5   print(list1);
6   print(list2);
7   print(list2.length);
8 }

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
setelah ditambah: {Jawir, 230444040078}
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
testing.dart:1:13: Error: Can't find ')' to match '{'.
void main() {
^
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
[1, 2, 3]
[0, 1, 2, 3]
4
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
testing.dart:5:9: Error: Undefined name 'list1'.
  print(list1);
  ^^^^^
PS D:\MobileProgramming\latihan\lib>
```

Sesudah

```
lib > testing.dart > main
Run | Debug | Profile
1 void main() {
2   var list = [1, 2, 3];
3   var list2 = [0, ...list];
4
5   print(list);
6   print(list2);
7   print(list2.length);
8 }

PROBLEMS 3 OUTPUT DEBUG CONSOLE TERMINAL PORTS

^
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
[1, 2, 3]
[0, 1, 2, 3]
4
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
testing.dart:5:9: Error: Undefined name 'list1'.
  print(list1);
      ^^^^^
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
[1, 2, 3]
[0, 1, 2, 3]
4
PS D:\MobileProgramming\latihan\lib>
```

Langkah kedua

Error karena seharusnya list saja bukan list1

Langkah ketiga

```
lib > testing.dart > main
Run | Debug | Profile
1 void main() {
2   var list = [1, 2, 3];
3   var list2 = [0, ...list];
4
5   print(list);
6   print(list2);
7   print(list2.length);
8
9   list1 = [1, 2, null];
10  print(list1);
11
12  var list3 = [0, ...?list1];
13  print(list3.length);
14 }
15
16

PROBLEMS 8 OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS D:\MobileProgramming\latihan\lib> dart run testing.dart
testing.dart:9:3: Error: Setter not found: 'list1'.
  list1 = [1, 2, null];
  ^^^^^
testing.dart:10:9: Error: Undefined name 'list1'.
  print(list1);
      ^^^^^
testing.dart:12:23: Error: Undefined name 'list1'.
  var list3 = [0, ...?list1];
                        ^^^^^
testing.dart:12:23: Error: Unexpected type 'invalid-type' of a spread. Expected 'dynamic' or an Iterable.
  var list3 = [0, ...?list1];
                        ^
PS D:\MobileProgramming\latihan\lib>
```

Yang benar

```
lib > testing.dart > main
1 void main() {
2
3
4
5
6   print(list2);
7   print(list2.length);
8
9   var list1 = <int?>[1, 2, null];
10  print(list1);
11
12  var list3 = [0, ...?list1];
13  print(list3);
14  print(list3.length);
15
16 }
```

PROBLEMS 7 OUTPUT DEBUG CONSOLE TERMINAL PORTS

testing.dart:12:23: Error: Undefined name 'list1'.
var list3 = [0, ...?list1];
 ^^^^

testing.dart:12:23: Error: Unexpected type 'invalid-type' of a spread. Expected 'dynamic' or an Iterable.
var list3 = [0, ...?list1];
 ^

PS D:\MobileProgramming\latihan\lib> dart run testing.dart
[1, 2, 3]
[0, 1, 2, 3]
4
[1, 2, null]
[0, 1, 2, null]
4
PS D:\MobileProgramming\latihan\lib>

Langkah ke empat

```
lib > testing.dart > main
1 void main() {
2
3
4
5
6
7
8
9   var list1 = <int?>[1, 2, null];
10  print(list1);
11
12  var list3 = [0, ...?list1];
13  print(list3);
14  print(list3.length);
15
16  var list4 = [230404440023];
17  print(list4);
18
19 }
```

PROBLEMS 8 OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS D:\MobileProgramming\latihan\lib> dart run testing.dart
testing.dart:1:13: Error: Can't find '}' to match '{'.
void main() {
 ^

PS D:\MobileProgramming\latihan\lib> dart run testing.dart
[1, 2, 3]
[0, 1, 2, 3]
4
[1, 2, null]
[0, 1, 2, null]
4
[230404440023]
PS D:\MobileProgramming\latihan\lib>

Kita harus menambahkan fungsi if (promo active) untuk menggunakan fungsi tersebut jika kita mengisi "true" maka outlet akan muncul dan jika "false" maka outlet tidak akan muncul

Langkah ke lima dan enam

```
lib > testing.dart > main
Run | Debug | Profile
1 void main() {
2   bool promoActive = true;
3   var nav = ['Home', 'Furniture', 'Plants', if (promoActive) 'Outlet'];
4   print(nav);
5
6   String login = 'user';
7   var nav2 = ['Home', 'Furniture', 'Plants', if (login == 'counter') 'Inventory'];
8   print(nav2);
9
10  var listOfInts = [1, 2, 3];
11  var listOfStrings = ['#0', for (var i in listOfInts) '#$i'];
12  assert(listOfStrings[1] == '#1');
13  print(listOfStrings);
14
15 }
16
```

PROBLEMS 3 OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
[Home, Furniture, Plants, Outlet]
[Home, Furniture, Plants, Inventory]
[#0, #1, #2, #3]
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
[Home, Furniture, Plants, Outlet]
[Home, Furniture, Plants, Inventory]
[#0, #1, #2, #3]
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
[Home, Furniture, Plants, Outlet]
[Home, Furniture, Plants]
[#0, #1, #2, #3]
PS D:\MobileProgramming\latihan\lib>
```

Langkah ini sama halnya dengan nomor 4 di atas jika ingin menampilkan inventory yang login harus counter selain itu maka akan hilang dan kesalahannya tadi seharusnya menggunakan == bukannya case jadi pembacannya "login=counter maka inventory". Manfaat for disini Membuat list lebih singkat, Mempermudah manipulasi elemen, Membuat efisien dalam code looping dalam list.

Praktikum 5: Eksperimen Tipe Data Records

Langkah ke Satu

```
lib > testing.dart > main
Run | Debug | Profile
1 void main() {
2   var record = ('first', a: 2, b: true, 'last');
3   print(record);
4 }
5

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL PORTS

[#0, #1, #2, #3]
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
[Home, Furniture, Plants, Outlet]
[Home, Furniture, Plants, Inventory]
[#0, #1, #2, #3]
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
[Home, Furniture, Plants, Outlet]
[Home, Furniture, Plants]
[#0, #1, #2, #3]
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
testing.dart:3:15: Error: Expected ';' after this.
  print(record)
                ^
PS D:\MobileProgramming\latihan\lib>
```

Langkah ke dua

```
lib > testing.dart > ...
Run | Debug | Profile
1 void main() {
2   var record = ('first', a: 2, b: true, 'last');
3   print(record);
4 }
5

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS

[Home, Furniture, Plants, Outlet]
[Home, Furniture, Plants, Inventory]
[#0, #1, #2, #3]
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
[Home, Furniture, Plants, Outlet]
[Home, Furniture, Plants]
[#0, #1, #2, #3]
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
testing.dart:3:15: Error: Expected ';' after this.
  print(record)
                ^
PS D:\MobileProgramming\latihan\lib> dart run testing.dart
(first, last, a: 2, b: true)
PS D:\MobileProgramming\latihan\lib>
```

Sebenarnya code nya tidak salah hanya kehilangan titik koma di belakangnya makanya bisa error.

Tugas Praktikum

1. Silakan selesaikan Praktikum 1 sampai 5, lalu dokumentasikan berupa screenshot hasil pekerjaan Anda beserta penjelasannya!
2. Jelaskan yang dimaksud Functions dalam bahasa Dart!
3. Jelaskan jenis-jenis parameter di Functions beserta contoh sintaksnya!
4. Jelaskan maksud Functions sebagai first-class objects beserta contoh sintaknya!
5. Apa itu Anonymous Functions? Jelaskan dan berikan contohnya!
6. Jelaskan perbedaan Lexical scope dan Lexical closures! Berikan contohnya!
7. Jelaskan dengan contoh cara membuat return multiple value di Functions!
8. Kumpulkan berupa link commit repo GitHub

Jawaban

1. Penjelasan tentang Functions dalam Dart Functions dalam Dart adalah blok kode yang dapat dipanggil untuk menjalankan suatu tugas tertentu. Functions digunakan untuk menghindari pengulangan kode, meningkatkan keterbacaan, dan modularitas dalam program.
2. **Jenis-jenis Parameter dalam Functions:**
 - Positional Parameters: Parameter yang harus diberikan dalam urutan yang tepat.
 - Optional Positional Parameters: Ditandai dengan `?` dan bisa tidak diberikan.
 - Named Parameters: Ditandai dengan `{}` dan bisa memiliki nilai default.
 - Required Named Parameters: Wajib diberikan dengan `required`.
3. Functions sebagai First-Class Objects Dart memperlakukan fungsi sebagai objek, sehingga bisa disimpan dalam variabel, dikirim sebagai parameter, atau dikembalikan dari fungsi lain.
4. Anonymous Functions Anonymous functions adalah fungsi tanpa nama yang dapat digunakan langsung dalam kode.
5. **Lexical Scope vs Lexical Closures**
 - Lexical Scope: Variabel dalam fungsi hanya dapat diakses dalam ruang lingkup tempat ia dideklarasikan.
 - Lexical Closures: Fungsi dalam Dart dapat "mengingat" variabel dari scope luar meskipun fungsi itu telah dieksekusi.
6. Return Multiple Values dalam Functions Dart tidak mendukung return multiple values secara langsung, tetapi bisa menggunakan List atau Map untuk mengembalikan beberapa nilai sekaligus.

