# TUGAS PEMROGRAMAN MOBILE 2


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**SIB 2F/16**

1. Buat program Dart sederhana untuk menghitung BMI (Body Mass Index) berdasarkan berat dan tinggi yang diinput.

```dart
import 'dart:io';
import 'dart:math';

Run | Debug | Profile | Windsurf: Refactor | Explain | Generate Function Comment | ×
void main() {
  final app = BmiApp();
  app.run();
}

Windsurf: Refactor | Explain
class BmiApp {
  Windsurf: Refactor | Explain | Generate Function Comment | ×
  void run() {
    final weight = _readDouble('Masukkan berat badan (kg): ');
    final heightCm = _readDouble('Masukkan tinggi badan (cm): ');

    final bmi = _calculateBmi(weight, heightCm);
    final category = _bmiCategory(bmi);

    print('\nHasil BMI Anda: ${bmi.toStringAsFixed(2)}');
    print('Kategori: $category');
  }

  Windsurf: Refactor | Explain | Generate Function Comment | ×
  double _readDouble(String label) {
    stdout.write(label);
    return double.parse(stdin.readLineSync()!);
  }

  Windsurf: Refactor | Explain | Generate Function Comment | ×
  double _calculateBmi(double weight, double heightCm) {
    final heightM = heightCm / 100;
    return weight / pow(heightM, 2);
  }

  Windsurf: Refactor | Explain | Generate Function Comment | ×
  String _bmiCategory(double bmi) {
    if (bmi < 18.5) return 'Kurus';
    if (bmi < 25) return 'Normal';
    if (bmi < 30) return 'Overweight';
    return 'Obesitas';
  }
}
```

Output :

```
Masukkan berat badan (kg): 62
Masukkan tinggi badan (cm): 170

Hasil BMI Anda: 21.45
Kategori: Normal
```

2. Buat kalkulator konversi mata uang dengan minimal 3 jenis mata uang.

```dart
import 'dart:io';

Run | Debug | Profile | Windsurf: Refactor | Explain | Generate Function Comment | ×
void main() {
  final app = CurrencyApp();
  app.run();
}

Windsurf: Refactor | Explain
class CurrencyApp {
  final Map<String, double> rates = {
    'USD': 1.0,
    'IDR': 15000.0,
    'EUR': 0.90,
  };

  Windsurf: Refactor | Explain | Generate Function Comment | ×
  void run() {
    print('Mata uang tersedia: ${rates.keys.join(', ')}');

    stdout.write('Dari: ');
    final from = stdin.readLineSync()!.toUpperCase();

    stdout.write('Ke: ');
    final to = stdin.readLineSync()!.toUpperCase();

    stdout.write('Jumlah: ');
    final amount = double.parse(stdin.readLineSync()!);

    final result = convert(from, to, amount);

    print('\nHasil: ${result.toStringAsFixed(2)} $to');
  }

  Windsurf: Refactor | Explain | Generate Function Comment | ×
  double convert(String from, String to, double amount) {
    if (!rates.containsKey(from) || !rates.containsKey(to)) {
      throw Exception('Mata uang tidak valid');
    }

    final baseAmount = amount / rates[from]!;
    return baseAmount * rates[to]!;
  }
}
```

Output :

```
Mata uang tersedia: USD, IDR, EUR
Dari: IDR
Ke: USD
Jumlah: 100000

Hasil: 6.67 USD
```

3. Buat program yang menerapkan semua jenis operator yang telah dipelajari dalam satu aplikasi konsol.

```dart
void main() {
  final app = OperatorApp();
  app.run();
}

Windsurf: Refactor | Explain
class OperatorApp {
  Windsurf: Refactor | Explain | Generate Function Comment | ×
  void run() {
    int a = 10;
    int b = 5;

    print('\nAritmatika');
    print('a + b = ${a + b}');
    print('a - b = ${a - b}');
    print('a * b = ${a * b}');
    print('a / b = ${a / b}');
    print('a % b = ${a % b}');

    print('\nAssignment');
    a += 5;
    print('a += 5 = $a');

    print('\nComparison');
    print('a > b = ${a > b}');
    print('a == b = ${a == b}');

    print('\nLogical');
    print('a > 5 && b < 10 = ${a > 5 && b < 10}');
    print('a < 5 || b == 5 = ${a < 5 || b == 5}');

    print('\nIncrement/Decrement');
    a++;
    b--;
    print('a++ = $a');
    print('b-- = $b');

    print('\nTernary');
    String result = a > b ? 'A lebih besar' : 'B lebih besar';
    print('a > b ? "A lebih besar" : "B lebih besar" → $result');
  }
}
```

Output :

```
Aritmatika
a + b = 15
a - b = 5
a * b = 50
a / b = 2.0
a % b = 0

Assignment
a += 5 = 15

Comparison
a > b = true
a == b = false

Logical
a > 5 && b < 10 = true
a < 5 || b == 5 = true

Increment/Decrement
a++ = 16
b-- = 4

Ternary
a > b ? "A lebih besar" : "B lebih besar" = A lebih besar
```

4. Tantangan Tambahan APK Konversi

```dart
import 'dart:io';

Run | Debug | Profile | Windsurf: Refactor | Explain | Generate Function Comment | ×
void main() {
  UnitConverterApp().run();
}

Windsurf: Refactor | Explain
class UnitConverterApp {
  final Map<String, Map<String, double>> _unitCategories = {
    'length': {
      'meter': 1,
      'kilometer': 1000,
      'centimeter': 0.01,
      'millimeter': 0.001,
      'mile': 1609.34,
    },
    'mass': {
      'gram': 1,
      'kilogram': 1000,
      'milligram': 0.001,
      'ton': 1000000,
      'pound': 453.592,
    },
    'volume': {
      'liter': 1,
      'milliliter': 0.001,
      'cubic_meter': 1000,
      'gallon': 3.78541,
      'cup': 0.24,
    }
  };
```

```dart
void run() {
  print('=== KATEGORI KONVERSI ===');
  print('Kategori tersedia: ${_unitCategories.keys.join(', ')}, temperature');

  final category = _readString('Pilih kategori: ').toLowerCase();

  if (category == 'temperature') {
    _convertTemperature();
    return;
  }

  if (!_unitCategories.containsKey(category)) {
    print('Kategori tidak valid');
    return;
  }

  final units = _unitCategories[category]!;

  print('Unit tersedia: ${units.keys.join(', ')}');

  final from = _readString('Dari: ');
  final to = _readString('Ke: ');
  final value = _readDouble('Nilai: ');

  if ((category == 'mass' || category == 'volume') && value < 0) {
    print('Nilai tidak boleh negatif');
    return;
  }

  if (!units.containsKey(from) || !units.containsKey(to)) {
    print('Unit tidak valid');
    return;
  }

  final result = _convert(units, from, to, value);

  print('\n=== HASIL KONVERSI ===');
  print('$value $from = ${result.toStringAsFixed(4)} $to');
}
```

```dart
double _convert(Map<String, double> units, String from, String to, double value) {
  final baseValue = value * units[from]!;
  return baseValue / units[to]!;
}

Windsurf: Refactor | Explain | Generate Function Comment | ×
void _convertTemperature() {
  print('Unit suhu: celsius, fahrenheit, kelvin');

  final from = _readString('Dari: ').toLowerCase();
  final to = _readString('Ke: ').toLowerCase();
  final value = _readDouble('Nilai: ');

  double result;

  if (from == 'celsius' && to == 'fahrenheit') {
    result = (value * 9 / 5) + 32;
  } else if (from == 'fahrenheit' && to == 'celsius') {
    result = (value - 32) * 5 / 9;
  } else if (from == 'celsius' && to == 'kelvin') {
    result = value + 273.15;
  } else if (from == 'kelvin' && to == 'celsius') {
    result = value - 273.15;
  } else {
    result = value;
  }

  print('\n=== HASIL KONVERSI ===');
  print('$value $from = ${result.toStringAsFixed(2)} $to');
}

Windsurf: Refactor | Explain | Generate Function Comment | ×
String _readString(String label) {
  stdout.write(label);
  return stdin.readLineSync()!.toLowerCase();
}

Windsurf: Refactor | Explain | Generate Function Comment | ×
double _readDouble(String label) {
  stdout.write(label);
  return double.parse(stdin.readLineSync()!);
}
```

Output :

```
=== KATEGORI KONVERSI ===
Kategori tersedia: length, mass, volume, temperature
Pilih kategori: mass
Unit tersedia: gram, kilogram, milligram, ton, pound
Dari: kilogram
Ke: ton
Nilai: 1500

=== HASIL KONVERSI ===
1500.0 kilogram = 1.5 ton
```