

## What are Operators in Dart?

Operators are **symbols** used to perform **operations on variables or values**.

Examples include: `+`, `-`, `*`, `/`, etc.

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### 1 Arithmetic Operators

These are used to perform **basic math operations**:

Operator	Description	Example	Output
<code>+</code>	Addition	<code>5 + 3</code>	8
<code>-</code>	Subtraction	<code>5 - 3</code>	2
<code>*</code>	Multiplication	<code>5 * 3</code>	15
<code>/</code>	Division	<code>5 / 2</code>	2.5
<code>~/</code>	Integer Division	<code>5 ~/ 2</code>	2
<code>%</code>	Modulus (remainder)	<code>5 % 2</code>	1

◆ Example:

```
dart
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void main() {
    int a = 10, b = 3;
    print(a + b); // 13
    print(a - b); // 7
    print(a * b); // 30
    print(a / b); // 3.333...
    print(a ~/ b); // 3
    print(a % b); // 1
}
```

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### 2 Increment & Decrement Operators

Used to **increase or decrease** a variable's value by 1.

Operator	Description	Example	Meaning
<code>++a</code>	Pre-increment	<code>a = 5; print(++a);</code>	Increases first, then uses → 6
<code>a++</code>	Post-increment	<code>a = 5; print(a++);</code>	Uses first, then increases → 5
<code>--a</code>	Pre-decrement	<code>a = 5; print(--a);</code>	Decreases first, then uses → 4
<code>a--</code>	Post-decrement	<code>a = 5; print(a--);</code>	Uses first, then decreases → 5

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## 3 Assignment Operators

Used to **assign or update** values to a variable.

Operator	Description	Example	Same as
<code>=</code>	Assign	<code>a = 10</code>	Assign value
<code>+=</code>	Add & assign	<code>a += 5</code>	<code>a = a + 5</code>
<code>-=</code>	Subtract & assign	<code>a -= 5</code>	<code>a = a - 5</code>
<code>*=</code>	Multiply & assign	<code>a *= 2</code>	<code>a = a * 2</code>
<code>/=</code>	Divide & assign	<code>a /= 2</code>	<code>a = a / 2</code>
<code>%=</code>	Modulus & assign	<code>a %= 2</code>	<code>a = a % 2</code>

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## 4 Logical Operators

Used to perform logical operations, usually inside **conditions** like `if`.

Operator	Meaning	Example
<code>&amp;&amp;</code>	AND – both must be true	<code>true &amp;&amp; false → false</code>
<code>'</code>		<code>'</code>
<code>!</code>	NOT – reverses the value	<code>!true → false</code>

- ◆ Example:

```

void main() {
    int age = 20;
    bool isStudent = true;

    if (age > 18 && isStudent) {
        print("Eligible for student offer");
    }
}

```

---

## 5 Type Test Operators

Used to **check or confirm a variable's type**.

Operator	Description	Example
is	Checks if variable is of type	x is int
is!	Checks if variable is <b>not</b> of type	x is! String

◆ Example:

```

void main() {
    var name = "Ansila";

    if (name is String) {
        print("This is a string");
    }

    if (name is! int) {
        print("This is not an integer");
    }
}

```

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## Final Summary

- **Arithmetic Operators** – Perform math operations.
  - **Increment/Decrement** – Increase or decrease value by 1.
  - **Assignment Operators** – Assign or update values.
  - **Logical Operators** – Used for true/false condition checks.
  - **Type Test Operators** – Used to check data type.
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Here's a **practical and fun Dart question** that uses both **relational operators** (`>`, `<`, `==`, `!=`, etc.) and **logical operators** (`&&`, `||`, `!`).

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### Question: Student Pass/Fail Checker

```
void main() {  
    int maths = 45;  
    int science = 60;  
    int english = 38;  
  
    bool isPassed = (maths >= 40 && science >= 40 && english >= 40);  
    print("Did the student pass? $isPassed");  
}
```

### Username & Password Check

```
void main() {  
    String username = "admin";  
    String password = "1234";  
  
    // User input (simulated)  
    String inputUsername = "admin";  
    String inputPassword = "1234";  
  
    // Check: username match AND password match
```

```
    bool isLoggedIn = (username == inputUsername && password ==  
inputPassword);  
  
    print("Login success? $isLoggedIn");  
}
```

## 🔥 Question: Temperature Alert System

```
void main() {  
    double roomTemp = 39.0;  
    bool acWorking = false; //current room temperature  
  
    // Alert condition: Room temp > 37 AND AC not working  
    bool alert = (roomTemp > 37.0 && !acWorking);  
  
    print("Temperature Alert? $alert");  
}
```

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## Question: Exam Pass Check

A student scored **32 marks** in an exam.

The **minimum pass mark is 35**.

Write a Dart program to check whether the student has passed or failed using **relational operator**.

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### Dart Code:

```
dart  
CopyEdit  
void main() {  
    int mark = 32;  
    bool isPassed = mark >= 35;  
    print("Passed: $isPassed");  
}
```

## Question: Attendance Shortage Check

A student has **65% attendance**. The school rule says that a student must have **at least 75% attendance** to write the exam.

Write a Dart program using a **relational operator** to check if the student has an **attendance shortage**.

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### Dart Code:

```
void main() {  
    int attendance = 65;  
    bool isShortage = attendance < 75;  
    print("Attendance Shortage: $isShortage");  
}  
Output //Attendance Shortage: true
```

## Question: Discount Eligibility Check

In a shopping app, users get a discount **only if the purchase amount is ₹500 or more**.

A customer's cart total is **₹480**.

Write a Dart program using a **relational operator** to check if the customer is **eligible for discount**.

---

### Dart Code:

```
void main() {  
    double price = 480;  
    bool isEligibleForDiscount = price >= 500;  
    print("Eligible for Discount: $isEligibleForDiscount");  
}
```

---

### Explanation (Manglish):

- `price >= 500` → Price ₹500 aanu alle enn check cheyyunnu.
  - true aayal discount kittum.
  - false aayal discount kittilla.
- 

### Output:

rust  
CopyEdit  
`Eligible for Discount: false`

---

## Question: Are Two Names the Same?

In a login form, the system checks if the **entered username** is **exactly same as the saved username**.

The saved name is "Ali"

User typed name is also "Ali"

Write a Dart program using a **relational operator** to check if both names are the same.

---

### Dart Code:

```
dart  
CopyEdit  
void main() {  
    String name1 = "Ali";  
    String name2 = "Ali";  
  
    bool isSame = name1 == name2;  
    print("Names are same: $isSame");  
}
```

---

### ? Explanation (Manglish):

- `name1 == name2` → rendu string equal aano enn check cheyyunnu.

- true aayal peru same aanu.
  - false aayal peru different aanu.
- 

### Output:

```
sql
CopyEdit
Names are same: true
```

---

## Question: Battery Low Warning

In a mobile phone, if the battery percentage is **less than or equal to 20%**, a "**Low Battery warning**" should be shown.

The current battery percentage is **15%**.

Write a Dart program using a **relational operator** to check if the **low battery warning** should be shown.

---

### Dart Code:

```
void main() {
  int battery = 15;
  bool isLow = battery <= 20;
  print("Low Battery Warning: $isLow");
}
```

---

### ? Explanation (Manglish):

- `battery <= 20` → Battery 20% il ninnu kurav aanu enn check cheyyunnu.
- true aayal low battery aanennu kaanikkanam.
- false aayal warning venda.

---

### Output:

yaml  
CopyEdit  
Low Battery Warning: true

---

## Question: Age and Citizenship Check for Voting

A person is **eligible to vote** only if:

- Age is **18 or more**
- AND the person is an **Indian citizen**

Write a Dart program using the **logical AND (&&)** operator to check whether the person can vote.

---

### Dart Code:

```
dart
CopyEdit
void main() {
    int age = 20;
    bool isIndian = true;

    bool canVote = age >= 18 && isIndian;
    print("Eligible to Vote: $canVote");
}
```

---

### Explanation (Manglish):

- `age >= 18` → age ok aano?
- `isIndian` → Indian aano?
- `&&` kond randum true aayal mathram eligible.

---

### Output:

vbnnet  
CopyEdit  
Eligible to Vote: true

## Question: Mobile Unlock Condition

A mobile phone should **unlock** if:

- The **fingerprint** is matched  
**OR**
- The **passcode** entered is correct

Write a Dart program using the **|| (OR)** operator to check if the phone can be unlocked.

---

### Dart Code:

```
dart
CopyEdit
void main() {
    bool isFingerprintMatched = false;
    bool isPasscodeCorrect = true;

    bool canUnlock = isFingerprintMatched || isPasscodeCorrect;
    print("Phone Unlocked: $canUnlock");
}
```

---

### Explanation (Manglish):

- **isFingerprintMatched** → Fingerprint match aayo?
- **isPasscodeCorrect** → Passcode correct aayo?
- **||** kond randil onnu true aayal phone unlock cheyyum.

---

### Output:

yaml

CopyEdit

Phone Unlocked: true

---

## Question: Discount Only for Verified & Premium Users

In a shopping app, **discount** will be shown **only if**:

- The **user is verified**,  
**AND**
- The **user is a premium member**

Write a Dart program using the **&& (AND)** operator to check whether to show the discount.

---

### Dart Code:

```
void main() {  
  bool isVerified = true;  
  bool isPremium = false;  
  
  bool showDiscount = isVerified && isPremium;  
  print("Show Discount: $showDiscount");  
}
```

---

### ? Explanation (Manglish):

- `isVerified` → user verified aanu?
- `isPremium` → premium member aano?

- `&&` operator use cheythatth kond randum true aayal mathrame discount kaanikkum.
- 

### Output:

```
sql
CopyEdit
Show Discount: false
```

## Practical Ternary Operator Examples

### Question: Pass or Fail Check

A student passes the exam if the mark is **40 or above**.  
Otherwise, the student fails.

Write a Dart program using a **ternary operator** to print "Pass" or "Fail" based on the given mark.

---

### Dart Code:

```
void main() {
  int mark = 45;

  String result = mark >= 40 ? "Pass" : "Fail";
  print("Result: $result");
}
```

---

### Explanation (Manglish):

- `mark >= 40` → true aayal pass ennu return cheyyum.
- false aayal fail ennu.

- `mark >= 40 ? "Pass" : "Fail"` → ithaan ternary operator.
- 

### Output:

Result: Pass

---

## Question: Vote Eligibility Check

A person is **eligible to vote** only if their **age is 18 or more**.

Use a **ternary operator** to check and print "**Eligible to Vote**" or "**Not Eligible**".

---

### Dart Code:

```
dart
CopyEdit
void main() {
    int age = 17;

    String eligibility = age >= 18 ? "Eligible to Vote" : "Not
Eligible";
    print(eligibility);
}
```

---

### ? Explanation (Manglish):

- `age >= 18` → true aayal "Eligible to Vote"
  - false aayal "Not Eligible"
  - Ternary format: `condition ? valueIfTrue : valueIfFalse`
- 

### Output:

Not Eligible

## Question: High Temperature Warning

If the **body temperature is greater than 38.0°C**, show "High Fever"  
Otherwise, show "Normal".

Use a **ternary operator** to implement this in Dart.

---

### Dart Code:

```
dart
CopyEdit
void main() {
    double temperature = 39.0;

    String status = temperature > 38.0 ? "High Fever" : "Normal";
    print("Status: $status");
}
```

---

### Explanation (Manglish):

- `temperature > 38.0` → true aayal "High Fever"
  - false aayal "Normal"
  - Ternary operator: `condition ? valueIfTrue : valueIfFalse`
- 

### Output:

Status: High Fever