**C++ Lesson: Enums (Enumerations)**

**1. What is an Enum?**

An **enum** (short for *enumeration*) is a **user-defined data type** that consists of a set of **named integer constants**.

Enums make code more readable and manageable by allowing you to use **names** instead of numbers for related constant values.

**2. Why Use Enums?**

* To represent a **fixed set of related values**
* To improve **code readability**
* To prevent the use of arbitrary numbers (magic numbers)

**3. Basic Syntax**

enum EnumName {

VALUE1,

VALUE2,

VALUE3

};

Behind the scenes, the compiler assigns each value an integer:

* VALUE1 → 0
* VALUE2 → 1
* VALUE3 → 2  
  ...and so on.

**Example:**

#include <iostream>

using namespace std;

enum Day { Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday };

int main() {

Day today = Friday;

if (today == Friday) {

cout << "It's almost the weekend!" << endl;

}

return 0;

}

**4. Assigning Custom Values**

You can also assign specific integer values:

enum Level {

LOW = 1,

MEDIUM = 5,

HIGH = 10

};

If you don’t assign a value, C++ will continue from the last assigned value.

**Example:**

#include <iostream>

using namespace std;

enum Priority {

LOW = 1,

MEDIUM, // becomes 2

HIGH = 10,

CRITICAL // becomes 11

};

int main() {

cout << LOW << endl; // 1

cout << MEDIUM << endl; // 2

cout << HIGH << endl; // 10

cout << CRITICAL << endl; // 11

return 0;

}

**5. Enums and Switch Statements**

Enums work great with switch statements for cleaner code.

**✅ Example:**

enum Status { PENDING, IN\_PROGRESS, COMPLETED };

Status taskStatus = IN\_PROGRESS;

switch (taskStatus) {

case PENDING:

cout << "Task not started." << endl;

break;

case IN\_PROGRESS:

cout << "Task is in progress." << endl;

break;

case COMPLETED:

cout << "Task completed!" << endl;

break;

}

**❌ 6. Common Mistakes**

| **Mistake** | **Why it's wrong** |
| --- | --- |
| Assigning a string to an enum | Enums only hold integers |
| Expecting enum names to be printed | You must write a function to convert enums to strings manually |

**🛠️ Student Task**

**✍🏽 Write a C++ program that:**

1. Declares an enum called TrafficLight with values RED, YELLOW, and GREEN
2. Assigns one of them to a variable
3. Uses a switch statement to print:
   * “Stop” for RED
   * “Slow down” for YELLOW
   * “Go” for GREEN

📌 Bonus: Use the enum in a simple logic flow, like simulating a traffic light system that changes based on user input.