

Lab # 10: Enumerations

EC-102 – Computer Systems and Programming

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Enumerations – Introduction

- Another approach to defining your own data type
- When we know in advance a **finite** list of values that a data type can take on
- Example: A data type representing days of the week
- In an enumeration, we must give a specific name to every possible value
- These permissible values of an enumeration are known as **enumerators**

Enumerations – Syntax

- An enum declaration defines the set of all names that will be permissible values of the type

```
1 enum days_of_the_week {Sun, Mon, Tue, Wed, Thu, Fri, Sat};
```

- In this example, the enum type `days_of_the_week` has seven enumerators: `Sun`, `Mon`, `Tue` and so on up to `Sat`
- Once enum type `days_of_the_week` has been declared as shown, the variables of this type can be defined as follows:

```
1 days_of_the_week day1, day2;
```

- Variables of an enumerated type, like `day1` and `day2` can be given any of the values listed in the enum declaration
- Values that weren't listed in the declaration cannot be used

Enumerations – Other Features

- Enumerations are treated internally as integers
- We can use standard arithmetic operators on standard enum types

```
1 day1 = Mon;  
2 day2 = Thu;  
3  
4 int diff = day2 - day1;  
5  
6 cout << "Days between = " << diff << endl;
```

- We can also use comparison operators

```
1 if(day1 < day2)  
2 {  
3     cout << day1 << " comes before " << day2 << endl;  
4 }
```

Solved Example

```
1 // demonstrates enum types
2 #include <iostream>
3 using namespace std;
4
5 enum days_of_the_week
6 {
7     Sun = 1,
8     Mon = 2,
9     Tue = 3,
10    Wed = 4,
11    Thu = 6,
12    Fri = 7,
13    Sat = 8
14 };
15
16 int main()
17 {
18     days_of_the_week day1, day2;
```

Solved Example

```
19  day1 = Mon;
20  day2 = Thu;
21
22  int diff = day2 - day1; // integer arithmetic
23  cout << "Days between = " << diff << endl;
24  if (day1 < day2) // can do comparisons
25  {
26      cout << "day1 comes before day2" << endl;
27  }
28  return 0;
29 }
```