Section 6: Variables & Constants

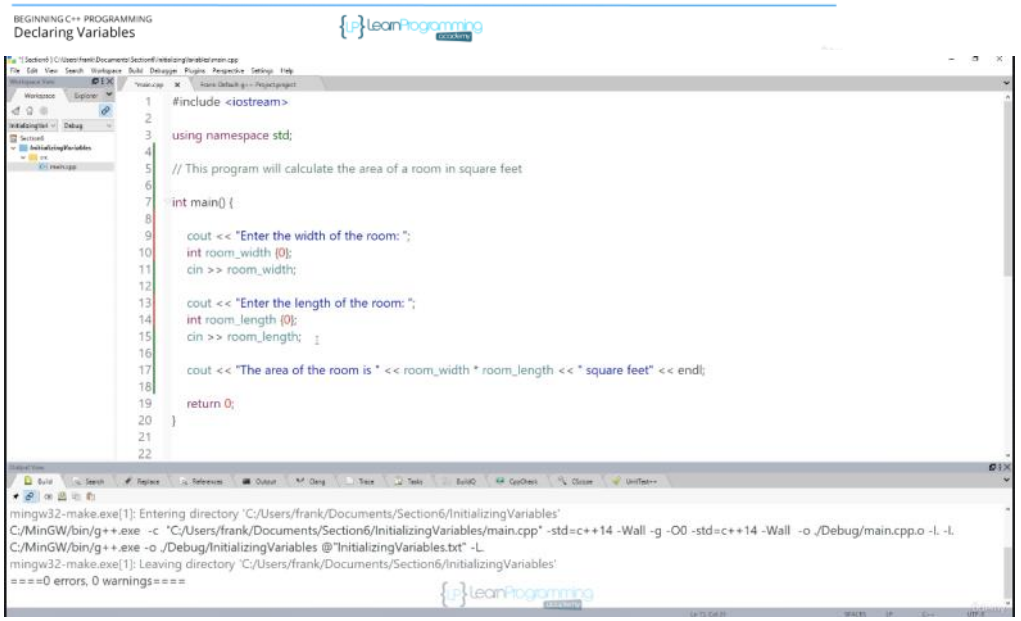
3 Ocak 2023 Salı 10:10

Lecture 45.Declaring and Initializing Variables

Declaring and Initializing Variables

Naming Variables

Legal	Illegal
Age	int
age	$age
_age	2014_age
My_age	My age
your_age_in_2014	Age+1
INT	cout
Int	return



Lecture 47. C++ Built-in Primitive Types

C++ Primitive Data Types

Character Types

- Used to represent single characters, 'A', 'X', '@'
- Wider types are used to represent wide character sets

Type Name	Size / Precision
char	Exactly one byte. At least 8 bits.
char16_t	At least 16 bits.
char32_t	At least 32 bits.
wchar_t	Can represent the largest available character set.

BEGINNING C++ PROGRAMMING
Primitive Types

Integer Types

- Used to represent whole numbers
- Signed and unsigned versions

Type Name	Size / Precision
signed **short** *int*	At least 16 bits.
signed **int**	At least 16 bits.
signed **long** *int*	At least 32 bits.
signed **long long** *int*	At least 64 bits

Type Name	Size / Precision
unsigned short *int*	At least 16 bits.
unsigned *int*	At least 16 bits.
unsigned long *int*	At least 32 bits.
unsigned long long *int*	At least 64 bits

Lecture 49. What is a Constant ?

What is a constant?

- Like C++ variables
  - Have names
  - Occupy storage
  - Are usually typed

However, their value cannot change once declared!

Types of constants in C++

- Literal constants
- Declared constants
  - `const` keyword
- Constant expressions
  - `constexpr` keyword
- Enumerated constants
  - `enum` keyword
- Defined constants
  - `#define`

Types of constants in C++

Literal constants

- The most obvious kind of constant

  x = **12**;
  y = **1.56**;
  name = "**Frank**";
  middle_initial = '**J**';

- Integer Literal Constants
  - 12 - an integer
  - 12U - an unsigned integer
  - 12L - a long integer
  - 12LL - a long long integer

- Floating-point Literal Constants
  - 12.1 - a double
  - 12.1F - a float
  - 12.1L - a long double

- Character Literal Constants (escape codes)
  - \n - newline
  - \r - return
  - \t - tab
  - \b - backspace
  - \' - single quote
  - \" - double quote
  - \\ - backslash

```
cout << "Hello\tthere\nmy friend\n";
Hello	there
my friend
```

Types of constants in C++

Declared constants

- Constants declared using the `const` keyword

```
const double pi {3.1415926};

const int months_in_year {12};

pi = 2.5;     // Compiler error
```

Types of constants in C++

Defined constants

- Constants declared using the `const` keyword

```
#define pi 3.1415926
```

Don’t use defined constants in Modern C++

Defined constants were very commonly used in older c and c++ code. These constants are defined using the pound define preprocessor directive.

I'm showing you defined constants because you may run into them since there is so much c++ legacy code out there.

Here you're telling the preprocessor that wherever it sees the word pi replace it with 3.1415926.

Think of this as a blind find replace as you might do in a word processor. The preprocessor will gladly substitute one for the other.

Since the preprocessor doesn't know c++, it can't type check and this could lead to difficult to find errors.

So please don't use defined constants in modern c++ code.