


5 Data Types and Expression Lectures - Week 2 - Data Types and Expressions - Introduction to Programming in C++ - edX_4ts - VLC media player

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The `bool` Data Type

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<u>Data</u>	<u>Expressions</u>	<u>Control Flow</u>
<ul style="list-style-type: none">• <code>int</code>• <code>float</code>• <code>double</code>• <code>char</code>• <code>string</code>• <code>bool</code>	<ul style="list-style-type: none">• I/O expressions• Arithmetic expressions	<ul style="list-style-type: none">• Sequential



00:20 14:48

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The `bool` Data Type

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Kind of data: Truth value (True/False)

Inner representation:

- Each `bool` data uses 1 byte (8 bits)
- False is represented by a byte of 0s
- True is any non-zero value




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The bool Data Type

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C++ literals: `true`, `false`


01:51 14:48

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The bool Data Type

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Not

p	not p
True	False
False	True


02:44 14:48

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The bool Data Type

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- Each `bool` data uses 1 byte (8 bits)
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True is any non-zero value

C++ literals: `true`, `false`

Boolean Operators: !


03:12 14:48

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The bool Data Type

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Not

p	not p
True	False
False	True

```
int main() {  
    bool b1, b2, b3;  
    b1 = true;  
    b2 = !b1;  
    b3 = !false;  
    return 0;  
}
```

03:38 14:48

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The bool Data Type

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And

p	q	p and q
True	True	True
True	False	False
False	True	False
False	False	False



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The bool Data Type

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- True is any non-zero value

C++ literals: `true`, `false`

Boolean Operators: `!`, `&&`




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The bool Data Type

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And

p	q	p and q
True	True	True
True	False	False
False	True	False
False	False	False

```
int main() {  
    bool b1, b2, b3;  
    b1 = true;  
    b2 = false;  
    b3 = b1 && b2;  
  
    return 0;  
}
```


04:55 14:48

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The bool Data Type

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And

p	q	p and q
True	True	True
True	False	False
False	True	False
False	False	False

```
int main() {  
    bool b1, b2, b3;  
    b1 = true;  
    b2 = false;  
    b3 = b1 && b2;  
    b3 = b1 && !b2;  
  
    return 0;  
}
```

05:06 14:48

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The bool Data Type

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Or

p	q	p or q
True	True	True
True	False	True
False	True	True
False	False	False

05:38 14:48


65%

We use inclusive or in programming c++

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The bool Data Type

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Kind of data: Truth value (True/False)

Inner representation:

- Each bool data uses 1 byte (8 bits)
- False is represented by a byte of 0s
- True is any non-zero value

C++ literals: **true, false**


Boolean Operators: **!, &&, ||**

07:49

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The bool Data Type

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Or

p	q	p or q
True	True	True
True	False	True
False	True	True
False	False	False

```
int main(){
    bool b1, b2, b3;
    b1 = false;
    b2 = b1 || !b1;
    b3 = b2 && (b1 || true);
    return 0;
}
```

08:33

14:48


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Boolean Expressions

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Boolean Expressions


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Atomic Boolean Expressions:

- The `bool` literals – `true`, `false`

Compound Boolean Expressions:

Simple boolean expressions combined with boolean operators (`!`, `&&`, `||`)



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Boolean Expressions

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```
int main() {  
    bool b;  
  
    b = true;  
    b = (true && !b);  
  
    return 0;  
}
```

11:00 14:48 65%

When `b = true`; it is Atomic Boolean expression & in second case it is compound Boolean expression

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Boolean Expressions

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Atomic Boolean Expressions:

- The `bool` literals – `true`, `false`
- Arithmetic expressions compared with relational operators (`<`, `>`, `<=`, `>=`, `=`)

Compound Boolean Expressions:

Simple boolean expressions combined with boolean operators (`!`, `&&`, `||`)


11:32 14:48 65%

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Boolean Expressions

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```
int main() {  
    bool b;  
    int x;  
  
    b = true;  
    b = (true && !b);  
  
    x = 3;  
    b = (x < 5);  
  
    return 0;  
}
```

12:16 14:48


12:16 14:48

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Boolean Expressions

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```
int main() {  
    bool b;  
    int x;  
  
    b = true;  
    b = (true && !b);  
  
    x = 3;  
    b = (x < 5);  
    b = (x >= 0) && (x < 5);  
  
    return 0;  
}
```

12:28 14:48

12:28 14:48

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Boolean Expressions


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Atomic Boolean Expressions:

- The `bool` literals – `true`, `false`
- Arithmetic expressions compared with relational operators (`<`, `>`, `<=`, `>=`, `==`, `!=`)

Compound Boolean Expressions:

Simple boolean expressions combined with boolean operators (`!`, `&&`, `||`)



14:01

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Boolean Expressions

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```
int main() {  
    bool b;  
    int x;  
  
    b = true;  
    b = (true && !b);  
  
    x = 3;  
    b = (x < 5);  
    b = (x >= 0) && (x < 5);  
    b = (x == 3) || (x == 4);  
  
    return 0;  
}
```

