GE3 COMPUTER SCIENCE

C AND C ++ LECTURE SERIES *FOR* B.SC 3RD SEMESTER *BY*

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LECTURE 3

OPERATORS AND EXPRESSIONS

Arithmetic Operators

A **+** B

Operator	Purpose
+	addition
–	subtraction
*	multiplication
/	division
%	remainder after integer division

Expression	Value
a + b	13
a – b	7
a * b	30
a / b	3
a % b	1

```
a - b / c * d
```

OPERATORS AND EXPRESSIONS

Unary Operators

- *increment operator,* ++

- *Decrement operator,* --

Suppose i = 1

```
printf("i = %d\n", i);
printf("i = %d\n", ++i);
printf("i = %d\n", i);
```

```
i = 1
i = 2
i = 2
```

```
printf("i = %d\n", i);
printf("i = %d\n", i++);
printf("i = %d\n", i);
```

```
i = 1
i = 1
i = 2
```

OPERATORS AND EXPRESSIONS

The sizeof() Operators

```
printf("integer: %d\n", sizeof i);
printf("float: %d\n", sizeof x);
printf("double: %d\n", sizeof d);
printf("character: %d\n", sizeof c);
```

```
integer: 2
float: 4
double: 8
character: 1
```

OPERATORS AND EXPRESSIONS

Relational Operators

i=1, j=2, k=3

Expression	Interpretation	Value
i < j	true	1
(i + j) >= k	true	1
(j + k) > (i + 5)	false	0
k != 3	false	0
j == 2	true	1

Operator	Meaning
<	less than
<=	less than or equal to
>	greater than
>=	greater than or equal to

Operator	Meaning
==	equal to
!=	not equal to

OPERATORS AND EXPRESSIONS

Logical Operators

Operator	Meaning
&&	and
||	or
!	not

i=7, f=5.5, c='w'

Expression	Interpretation	Value
(i >= 6) && (c == 'w')	truc	1
(i >= 6) || (c == 119)	true	1
(f < 11) && (i > 100)	false	0
(c != 'p') || ((i + f) <= 10)	true	1

OPERATORS AND EXPRESSIONS

The associativity of previous Operators

Operator category	Operators	Associativity
unary operators	− ++ −− ! sizeof (*type*)	R → L
arithmetic multiply, divide and remainder	* / %	L → R
arithmetic add and subtract	+ −	L → R
relational operators	< <= > >=	L → R
equality operators	== !=	L → R
logical *and*	&&	L → R
logical *or*	||	L → R

OPERATORS AND EXPRESSIONS

Example 1

---

i=7, f=5.5, c='w'

Expression	Interpretation	Value
i + f <= 10	false	0
i >= 6 && c == 'w'	true	1
c != 'p' || i + f <= 10	true	1

OPERATORS AND EXPRESSIONS

Assignment Operators

expression 1 += expression 2

is equivalent to

expression 1 = expression 1 + expression 2

expression 1 -= expression 2

is equivalent to

expression 1 = expression 1 - expression 2

```
i += 5                          i = i + 5
```

OPERATORS AND EXPRESSIONS

Assignment Operators (cont.)

Suppose i = 5, j = 7, f = 5.5 g = - 3.25

Expression
i += 5
f -= g
j *= (i - 3)
f /= 3
i %= (j - 2)

Equivalent Expression	Final value
i = i + 5	10
f = f - g	8.75
j = j * (i - 3)	14
f = f / 3	1.833333
i = i % (j - 2)	0

OPERATORS AND EXPRESSIONS

Conditional Operator

$$expression\ 1\ ?\ expression\ 2\ :\ expression\ 3$$

$$min = (f < g)\ ?\ f : g$$

Suppose f = 6 and g = 34

Then min = 6

Suppose f = 56 and g = 34

Then min = 34

THANK YOU

C and C++ Programming Lecture Series

End of Lecture 3

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