COL100 Lecture 5

Note Title 8/6/2018

Review C++

cout (output to user)

arithmetic ops

types

type interchange

== != < > <= >= relational ops

precedence

variable declaration

LHS = RHS

value

variable assignment

pre/post-increment/decrement

(x == x+1)

false

x = x + 1 ; ✓

Today:

input from user

logical ops

if - then - else

1+2 = 3+4 ✗

cout << exp << exp exp;

<< exp ...

```
int x;
double y = x + 1.01;
```

double

X

```
y = int(y);
```

```
int x = 0;
x = x++;
```

x ← 1

x ← 0

X

precedence

assignment has lowest precedence

$x \underline{\underline{+=}} x++$

$x = x++$

$(x = x)++$ ✗

$x = (x++)$ ✓

first RHS

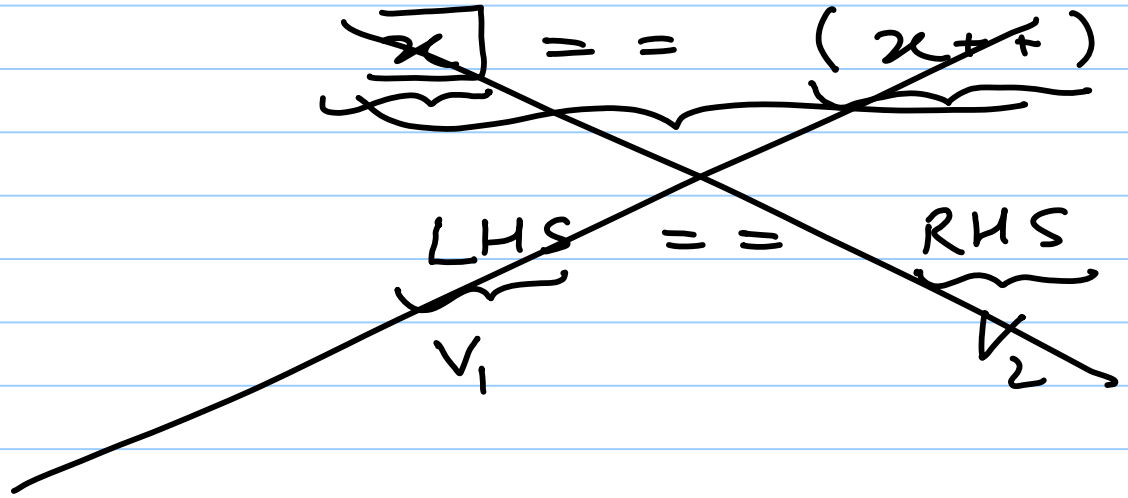
$x \mapsto 1$

then assign LHS

$x \mapsto 0$

$x == x++$

illegal expr



$x = x + y;$

$x \mathrel{+}= y;$

} same

~~string y; x = y + "Z";~~

~~x = (int) y;~~

~~x = +y;~~

~~string y = "hello";~~

~~str~~

User Input

```
#include "simpio.h"
#include <iostream>
int = getInteger( " prompt string");

int main()
{
    int x = getInteger(" Enter a num: ");
    int y = getInteger(" Enter another num: ");
```

```
double x = getReal ("prompt");
           getDouble ("prompt");

cout << getDouble ("prompt 1") + getInteger ("prompt 2")
     << endl;
```

```
int main()
{
    int x = getInteger("p1");
    double y = getDouble("p2");
    cout << "hello" << endl;
}
```

Type string

"hello"

"hello world"

"hello \n"
6

"hello \\ n"
7

string s;
int i;

s = "hello";

s = "10"; ✓

i = "hello"; ✗

s = 10; ✗

```
string s = getLine("prompt");
    cout << "You typed " << s << endl;

bool b = getYesOrNo("prompt");
```

string s = "hello \n world"
5 1 5

⇒ cout << s;

hello
world $

If-then-else in C++

```
if (condition)
{
    statement 1;
    statement 2;
    ...
    ...
}
statement 3;
statement 4;
...
```

```
if (condition)
{
    statement 1;
    statement 2;
    ...
} else {
    statement 3;
    statement 4;
    ...
}
stat 5;
stat 6;
...
```

```
int main()
{
    string name = getLine("Student Name? ");
    int age = getInteger("How old are you? ");

    double gpa = getDouble("What's your
                            GPA so far? ");

    if (getYesOrNo("Destroy the universe?"))
    {
        ...
    } else {
        ...
    }
}
```

```
bool b = ~~getYesOrNo("Destroy?")~~ 1 < 2 ; n ≤ 1 ;

if (b)
{
    ...
}
else
{
    ...
}
```

```
boo

    if    ( x < 1 )
    {     . . .

    }
    else
    {           . . .

    }
```

```
bool b = getYes...

if (b == true)
{

}
else
{
    ...
    ...
    ...

}
```

```
if (b == false)
{
    ...

}
```

```
int main()
{
        int g = getInteger(" votes against no-confidence?");
        int o = getInteger(" votes for no-confidence? ");

        if (g > o)
        {
            cout << " Government won" << endl;
        } else if (o > g) {
            cout << " Oppn. won" << endl;
        } else {
            cout << "Tie" << endl;
        }
}
```

```
if (g > 0)
{
    ...
}
else
{
    if (0 > g)
    {
        cout << "Oppn. won" << endl;
    }
    else
    {
        cout << "Tie!\n";
    }
}
```

nested if-then-else

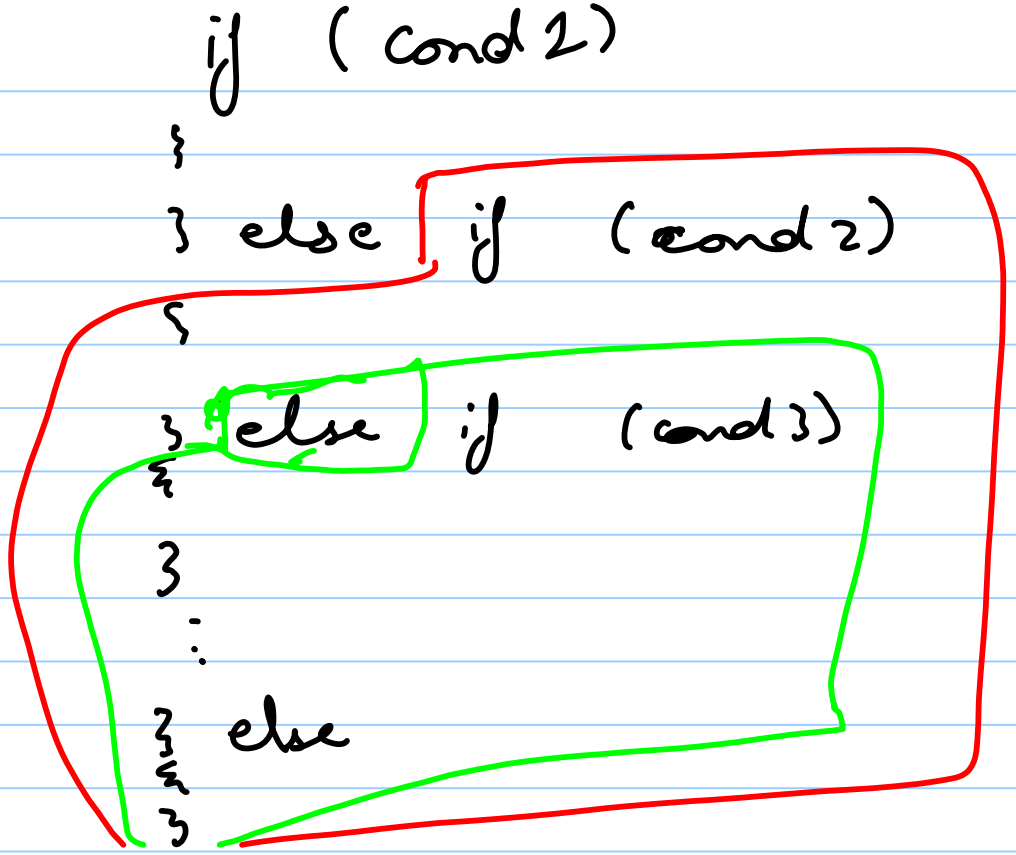
Avoiding "{ }" if single statement

```
if (condition)
    statement 1;
statement 2;
```

```
if (condition)
{
    statement 1;
    statement 2;
}
else
    statement 3;

statement 4;
```

```
if (g > 0)
{
    ...
}
else if (0 > g)
{
    ...
}
else
{
    ...
}
```


if (cond 2)
{
} else if (cond 2)
{
} else if (cond 3)
{
}
.
.
.
} else
{
}

Logical Operators → logical and

```
if (cond1 && cond2)
{

}
```

TRUE && TRUE : TRUE
FALSE && TRUE : FALSE
FALSE && FALSE : FALSE
TRUE && FALSE : FALSE

```
if (name == "A" && age == 20)
{
    ...
}
```

&& : and

|| : or

! : not

```
bool b = getYesOrNo("...");
if (!b)
{
    ...
}
```

! b && a || c . . .

Precedence :

!

&&

||

x == 3 && y == y + 10

Precedence: Arithmetic > Relational > Logical

$x == 3 \;\; || \;\; y \; != \; 4+10$