COL100 Lecture 3

Note Title 7/30/2018

Karel

move()
pickBeeper()
putBeeper()
turnLeft()

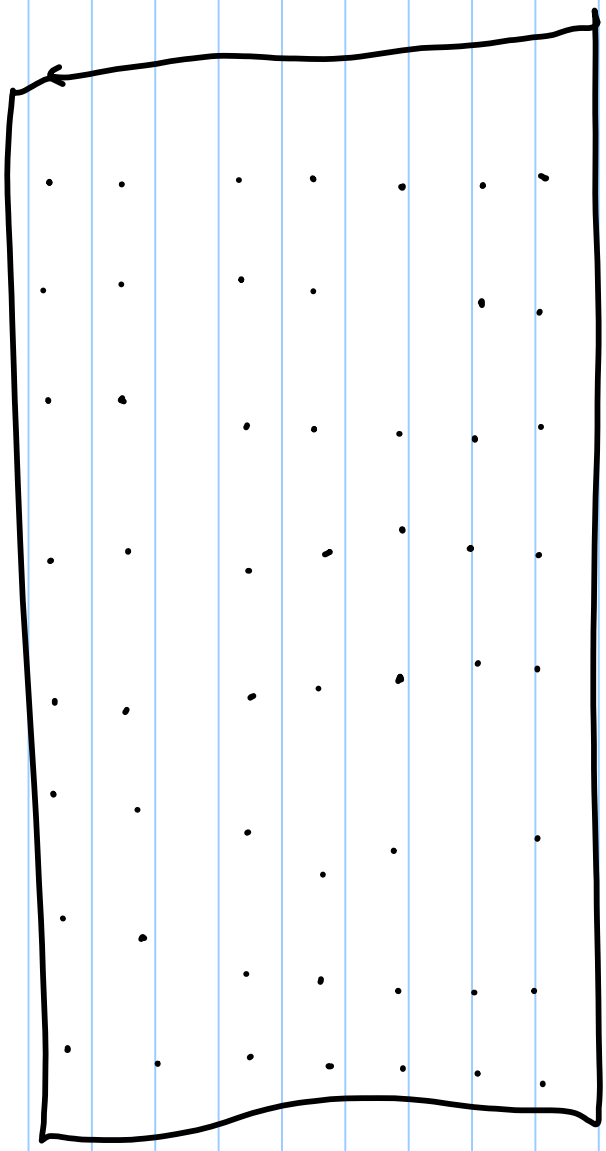
frontIsClear()
beeperPresent()

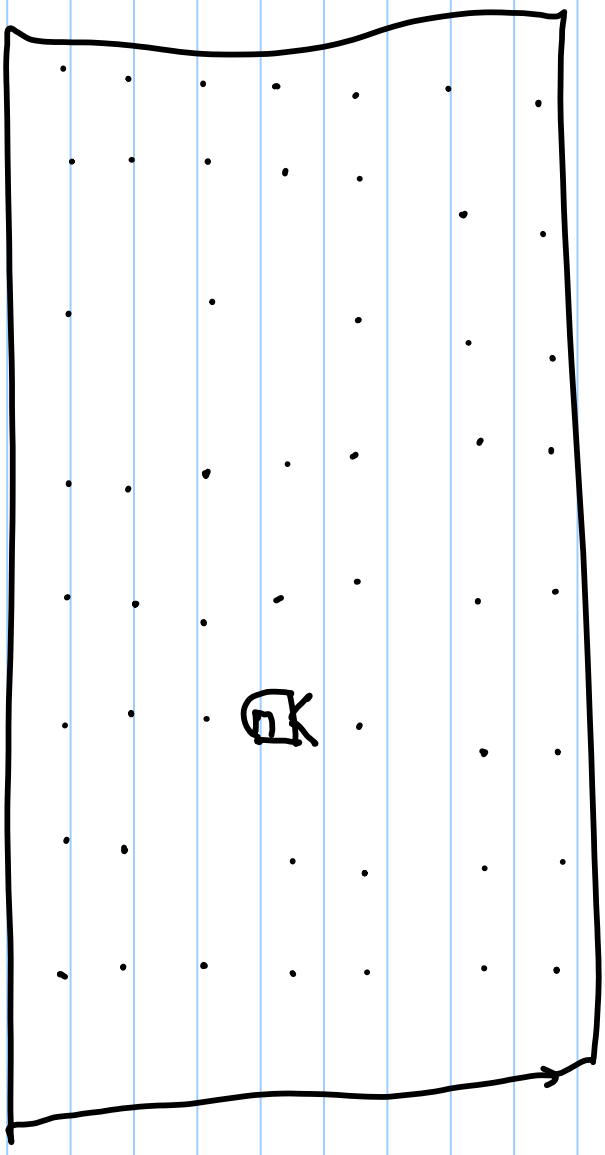
- if-then
- if-then-else
- for
- while

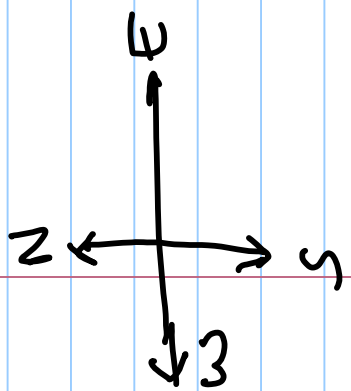
variable
assignment

x = 3

x




R


E
N
S
3

{0, 1, 2 ... count - 1}

initialize condition step

for (i = 0 ; i < count ; i++)

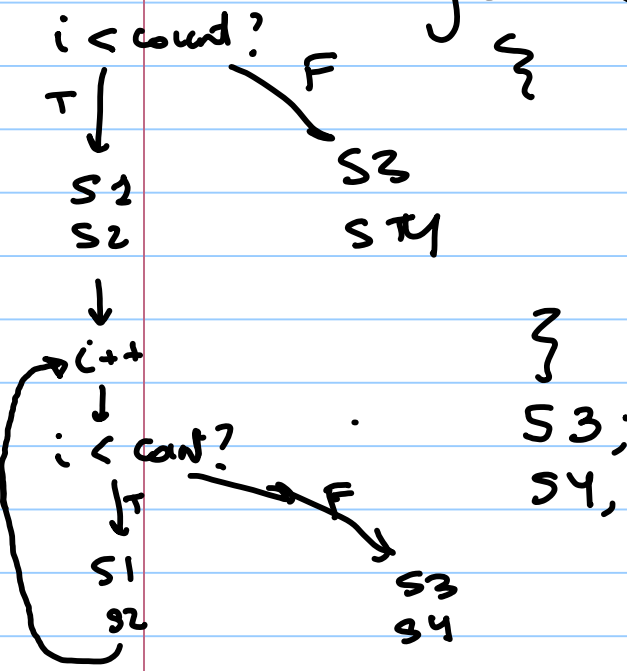
{

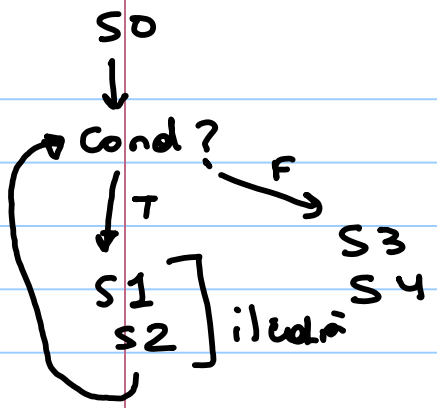
S1 ;
S2 ;

body

}

S3 ;
S4 ;



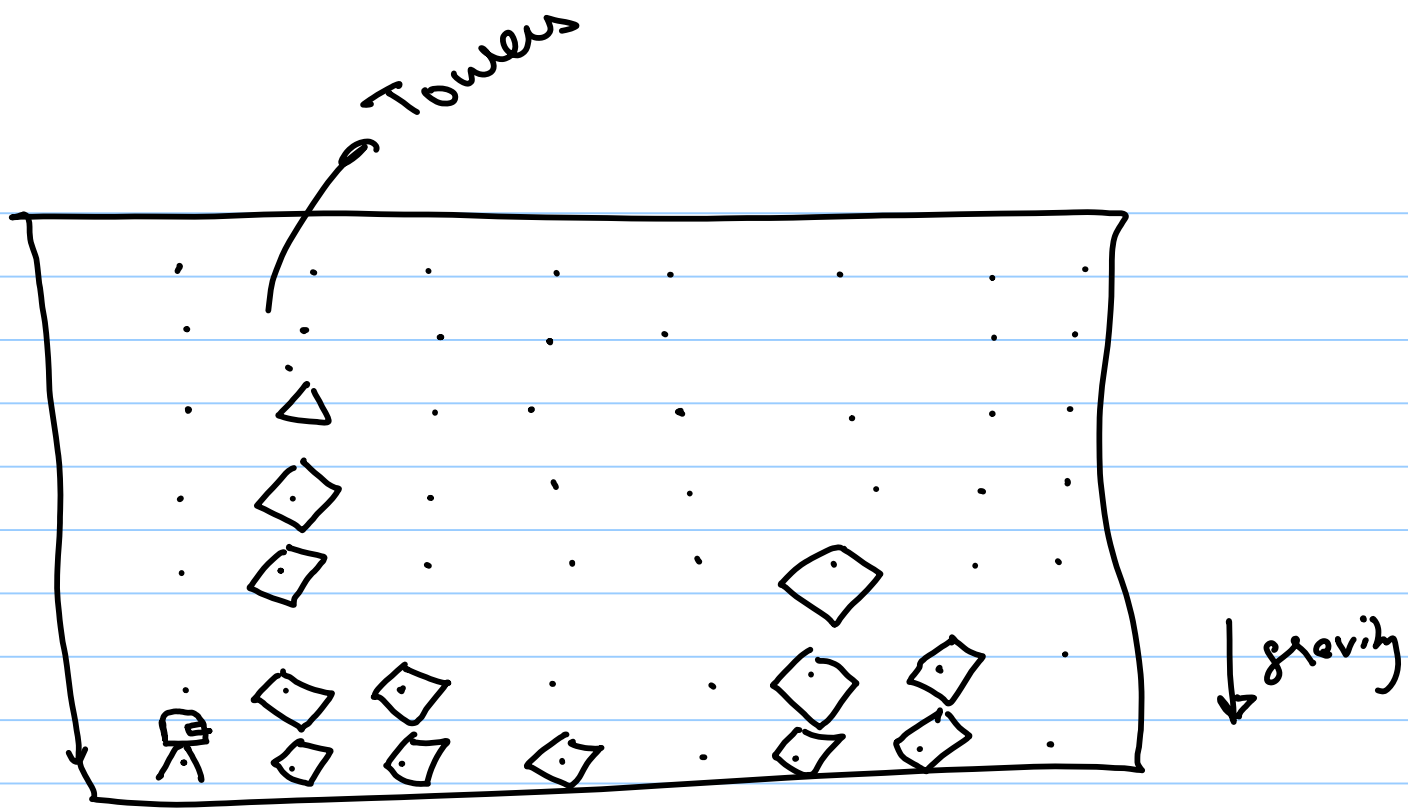



```
S0;
while (<cond>)
{
    S1 ;
    S2;
}
S3;
S4;
```

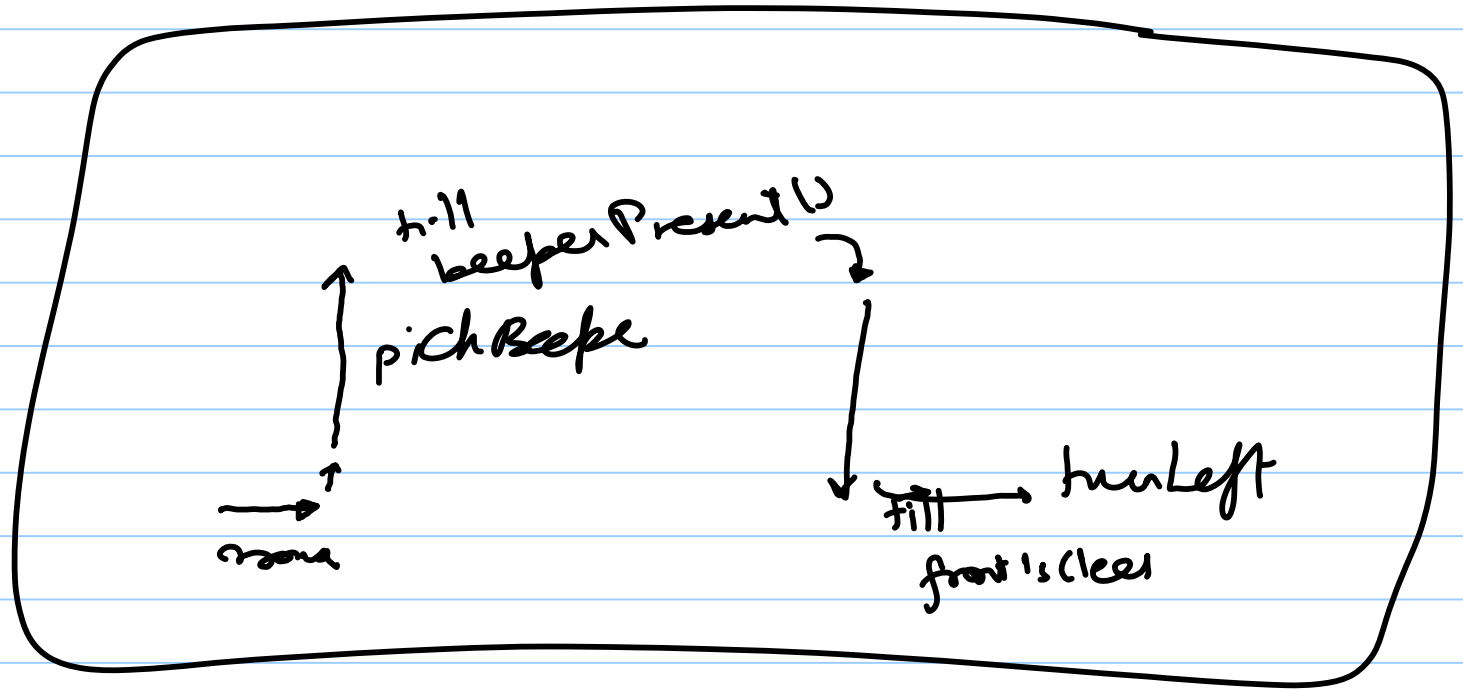
iteration

```
moveTillClear()
    while (frontIsClear())
    {
        if (frontIsClear())      X not needed
        {
            move();
        }
    }
    print "I am done";
```

```
moveTillClear()
{
    while (frontIsClear())
    {
        move();
    }
}
```


Towers
gravity

Repeat till frontIsClear



Top-down

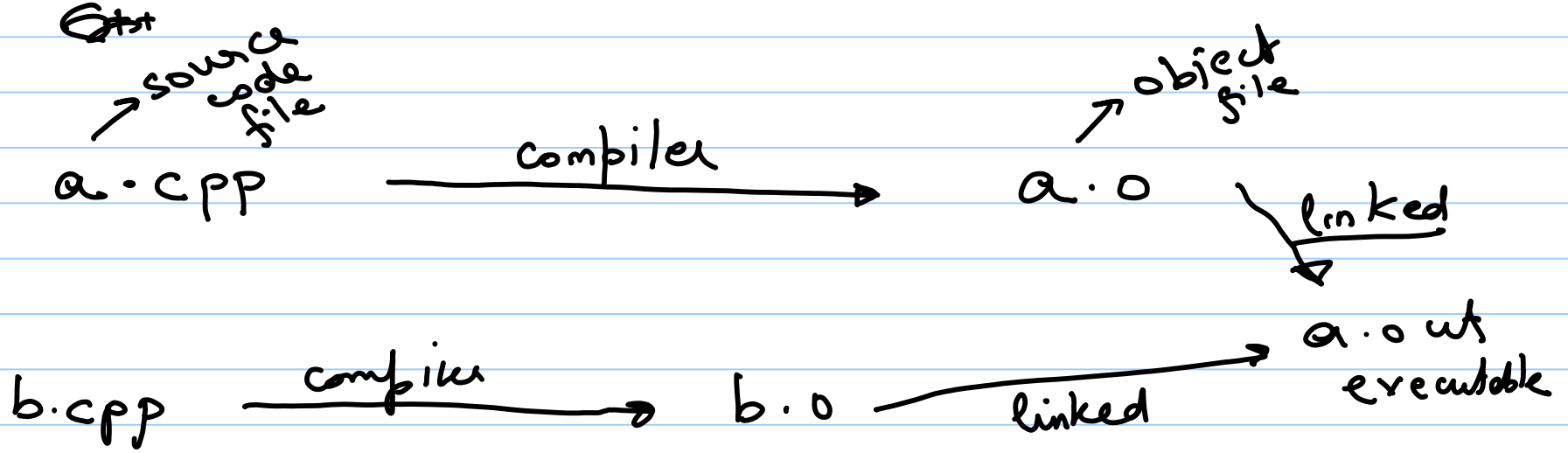
Bottom-up

```
clearAllTowers()
{
    while (frontIsClear())
    {
        moveOne();
        clearTower();

    }
}
```

```
clearOneTower()
{
        turnLeft();
        while (beeperPresent())
        {
                pickBeeper()
                if (frontIsClear())
                move();
        }
        turnAround();
        while (frontIsClear()) {
        {
                move();
        }
        turnLeft();
}
```

C++ → 1983 Bjarne Stroustrup



First C++ program

hello world

```
/* hello.cpp
   This program prints hello world
*/
#include <iostream>
using namespace std;
int main()
{
        cout << "Hello, world!" << endl;
        return 0;
}
```

std::cout

std::endl

endl = end of line

Comments

multi-line ← /* xyz abc ... rzz */

single-line // xyz

↗ hash / pound

include <name of lib>
" name of lib "

library of functions

standard library

Namespaces

Functions and variables are divided (scoped) by namespace

Normally x n

n::x

using namespace n;

x equivalent to n::x

Main function?

→ entry point of the program

always returns an integer

0: SUCCESS

1
2
3
.
} FAILURE

```
type        name ( )
{

            body


}
```

User Input and Output

```
cout << "<" ;
```

```
cout << expression1 << expression2
     << .... ;
```

Stream operator

```
cout << 12 ;          12
cout << 1 ;           1
cout << 1 << 2 ;      12
cout << "1" << "'a" << 2 ;   1 a 2
```

integer

string of characters

cout << 1 << endl << 2 << endl;

1
2

"\n"

cout << 1 << " " << 2 << "\n";

1
2

" "

1 2

```
cout << 1;
cout << 2;
```

"\n"

↓

newline character

12

escape characters

"1\n"

"1\\n"

1\n

```
int main()
{
    int age = 20;

    cout << "Most of you are " << age
         << " years old!\n";
    return 0;
}
```

type name = value;

type

int	integer
double	decimal
char	"a", "b" .. "z"
bool	boolean

int numberOfStudents = 55;
double averageAge = 20.0;

int n; → declaration of `n`

n = 515; → assignment

X

n = 515 error!

int n;

double ~~int~~ n; error!