

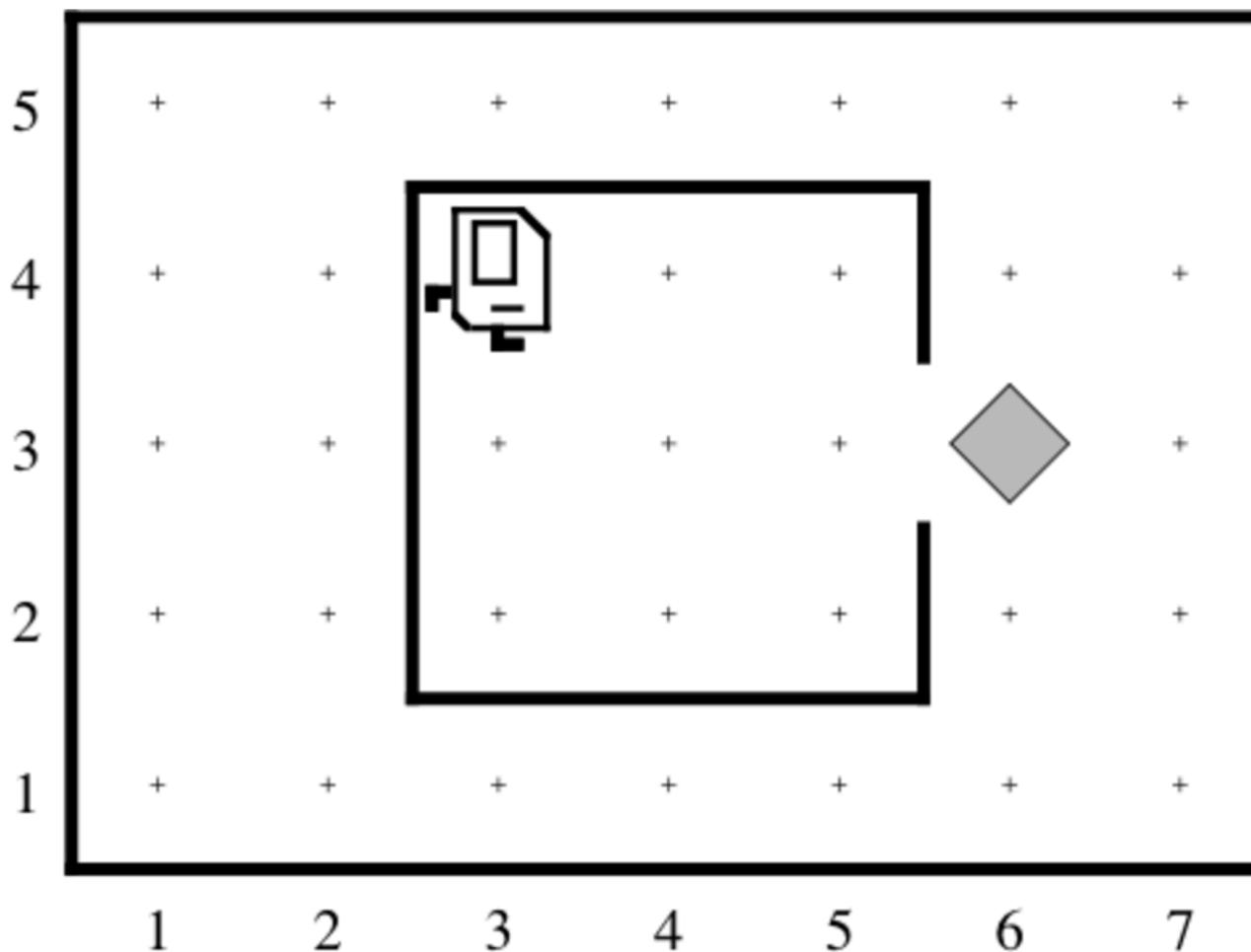


Control Flow

Before we start:

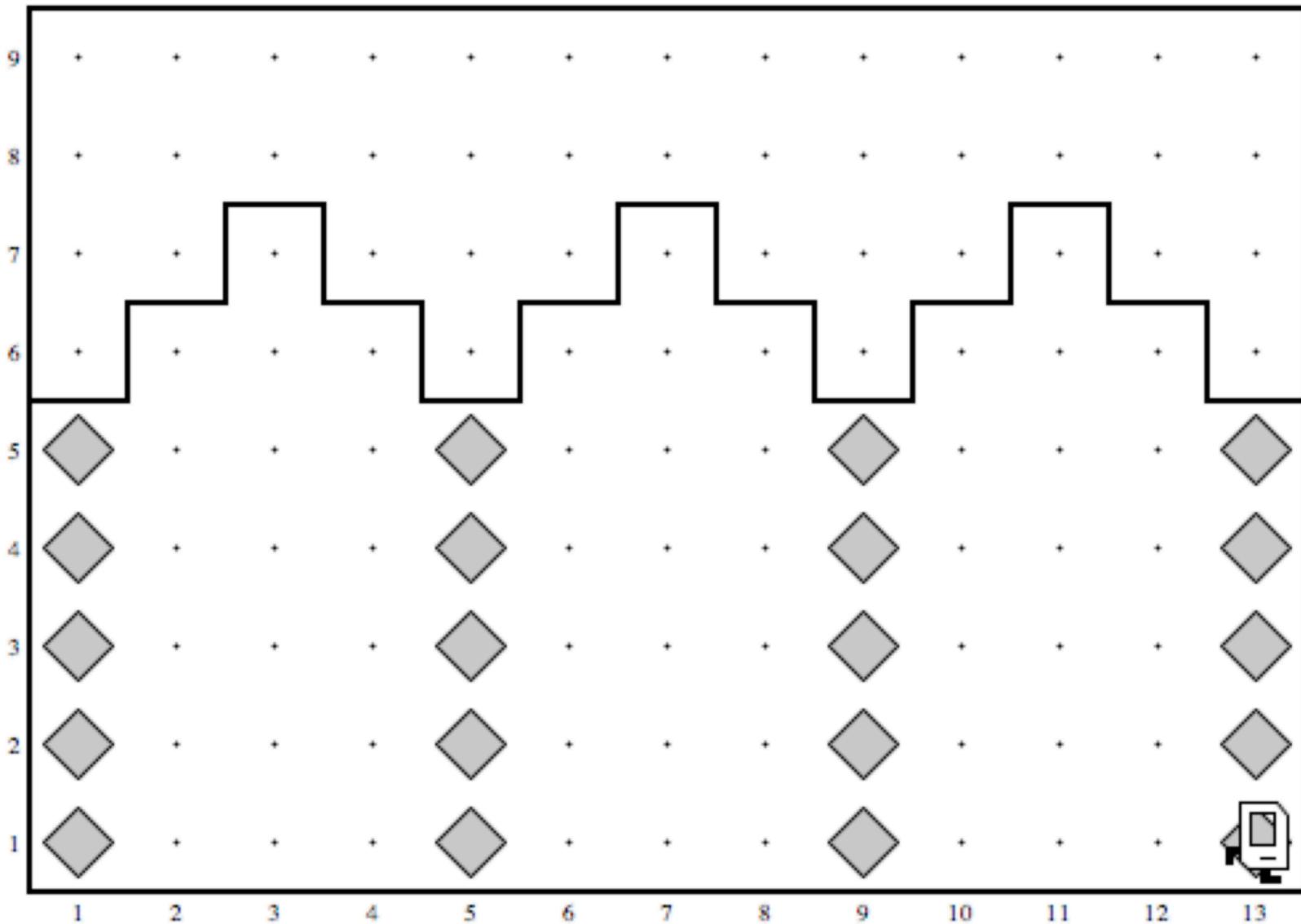
Any questions on Karel?

Newspaper Karel



Any trouble implementing this task?

You know how to make Karel build Efes



That's fun! . . .

...but a robot should get prepared
for the dangers of the world



...awareness about the environment
would save lives

...awareness about the environment
would save lives

Karel should know how to:

...count the steps

...awareness about the environment
would save lives

Karel should know how to :

...count the steps
...check what's around

...awareness about the environment
would save lives

Karel should know how to :

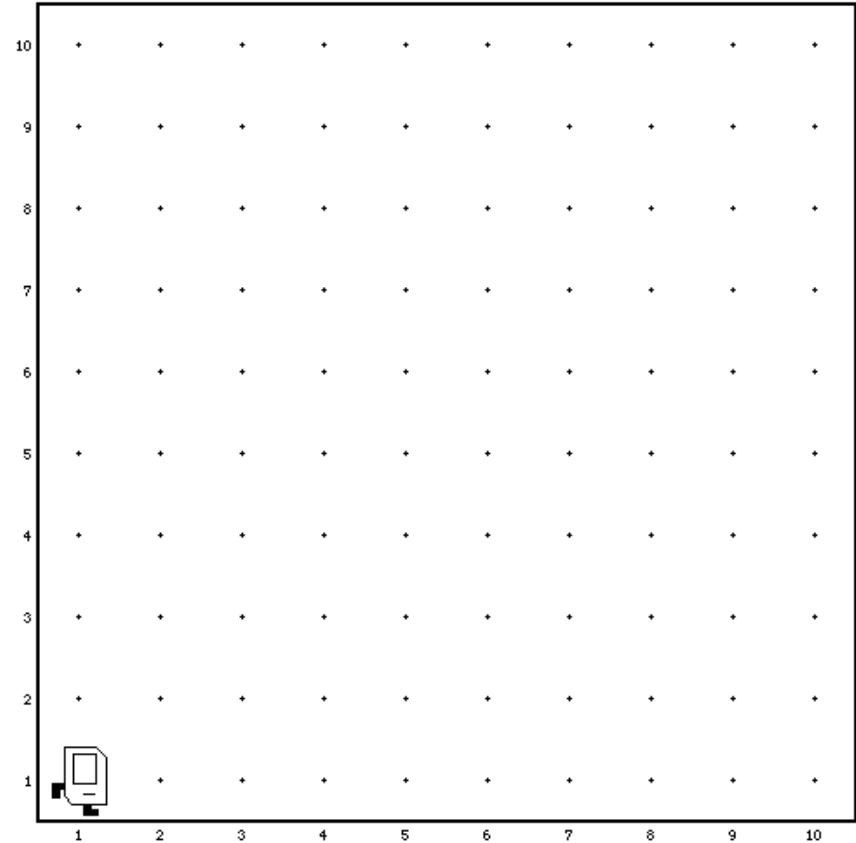
...count the steps
...check what's around
...adjust to the environment

But first:

Who likes dancing here?

Yanar Döner Karel

```
import stanford.karel.*;  
public class YanarDoner extends SuperKarel {  
  
    public void run() {  
        //Dance  
        move();move();turnLeft();  
        move();move();turnLeft();  
        move();move();turnLeft();  
        move();move();turnLeft();  
    }  
}
```

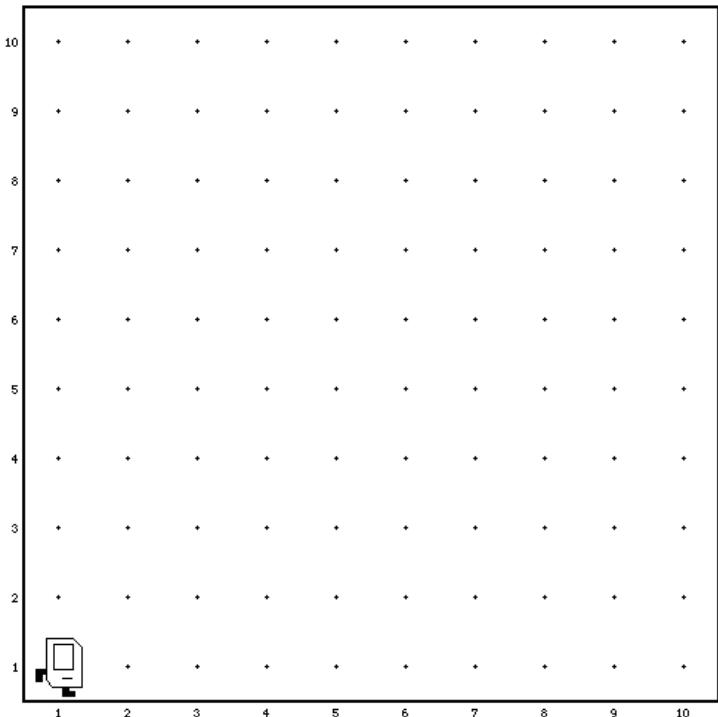


Doing it once is not real dance, what about
some more 'loops'

Yanar Döner Karel

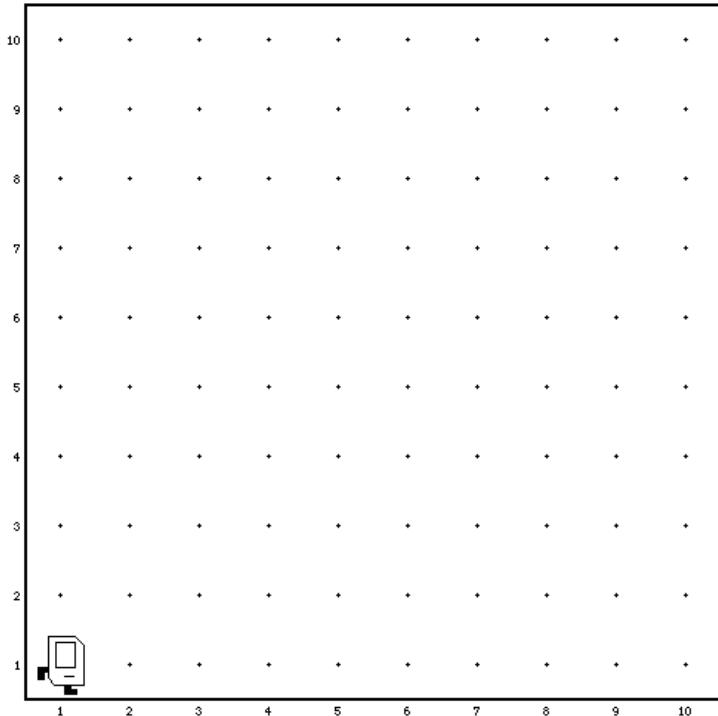
```
import stanford.karel.*;
public class YanarDoner extends SuperKarel {

    public void run() {
        //Dance
        for(int i=0;i<4;i++) {
            move();move();turnLeft();
            move();move();turnLeft();
            move();move();turnLeft();
            move();move();turnLeft();
        }
    }
}
```



Yanar Döner Karel

```
import stanford.karel.*;  
public class YanarDoner extends SuperKarel {  
  
    public void run() {  
        //Dance  
        for(int i=0;i<4;i++) {  
            for(int k=0;k<4;k++) {  
                move();move();turnLeft();  
            }  
        }  
    }  
}
```



Understanding for loops

```
for(int numTickets = 3; numTickets > 0; numTickets--) {  
    dance();  
}
```

Initialization: int numTickets = 3;



Condition check: numTickets > 0;

The loop



Update/decrement: numTickets--

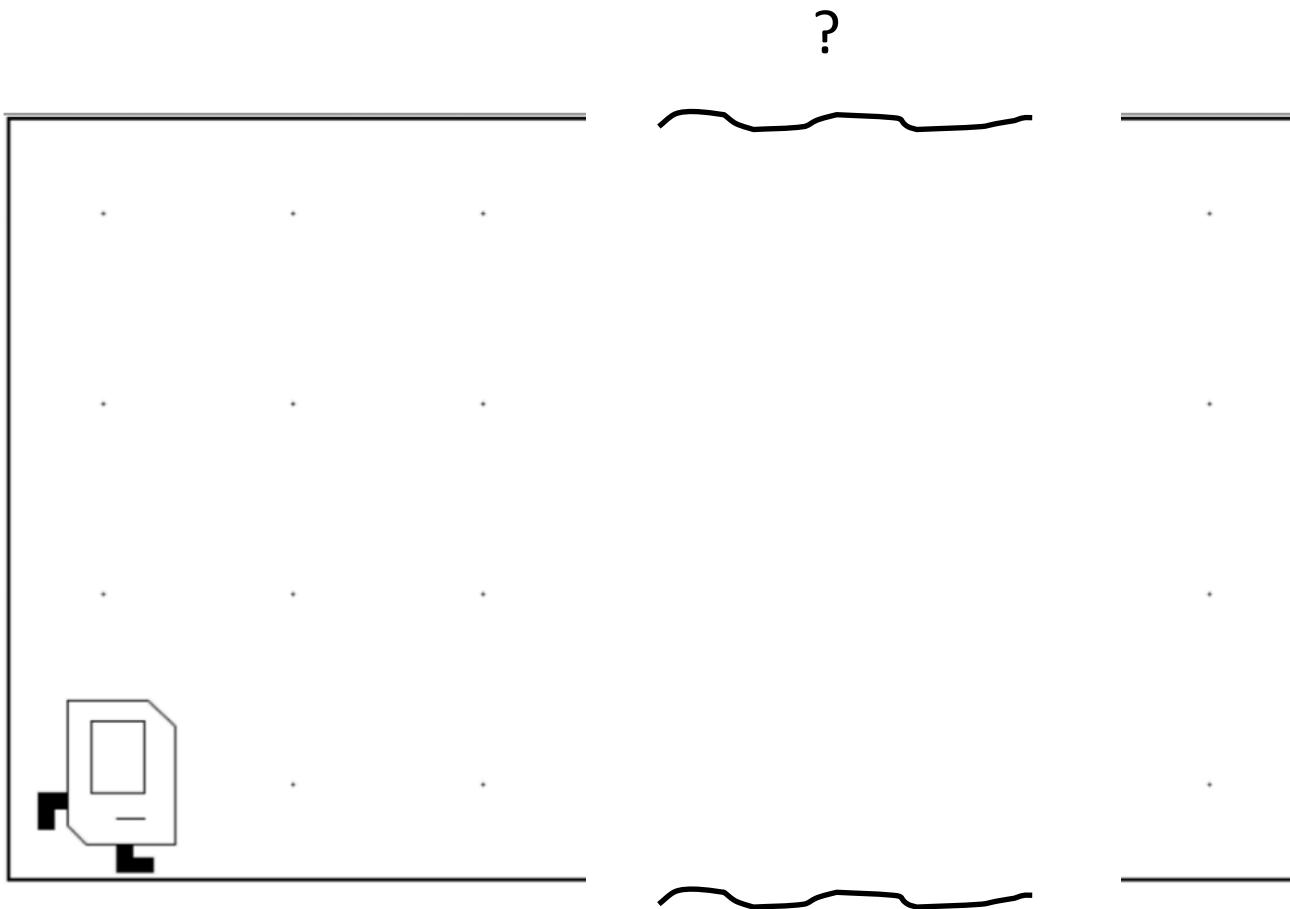
Understanding for loops

```
for(int numTickets = 3; numTickets > 0; numTickets--) {  
    dance();  
}
```

```
for(int i = 0; i < 4; i++) {  
    dance();  
}
```

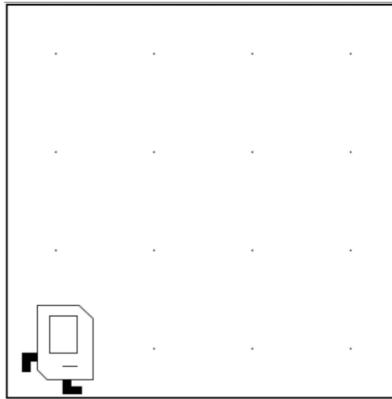
You can stick to the example
until we talk about **int** and **++**

Don't Know World Size

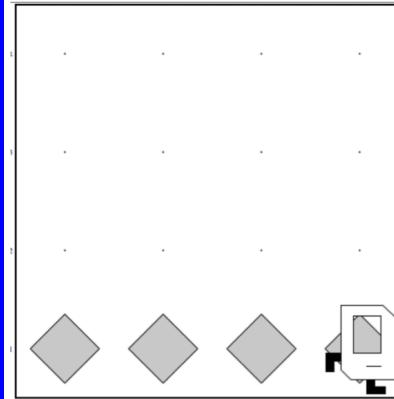


Work in Any World

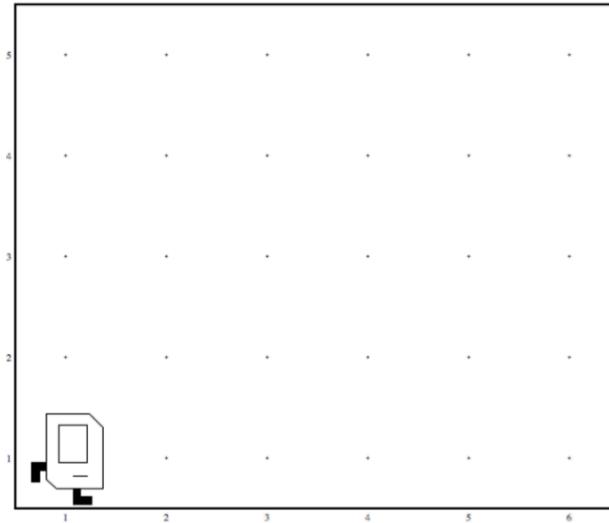
Before



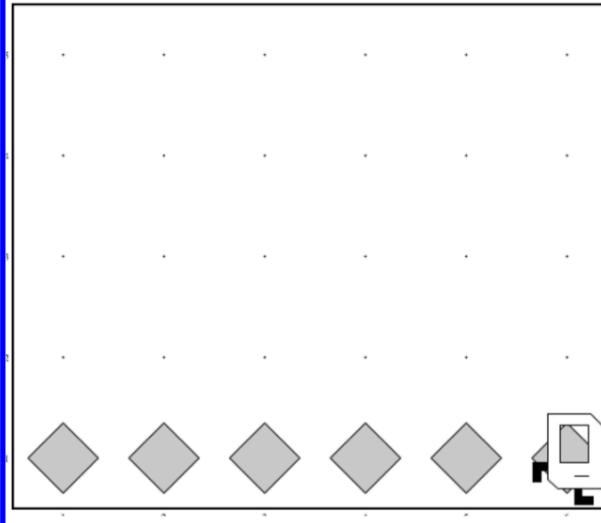
After



Before



After



While Loop

While Loop

```
import stanford.karel.*;  
  
public class BeeperLine extends SuperKarel {  
  
    public void run() {  
  
        // example while loop  
        while(condition) {  
            code to repeat  
        }  
    }  
  
}
```

Check the condition

True -> execute

Check the condition

True -> execute

....

Check the condition
False-> don't execute.

Continue the rest of the program

Place Beeper Line

```
import stanford.karel.*;

public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
        while(frontIsClear()) {
            move();
        }
        // extra put beeper
        putBeepers();
    }
}
```



Any guess what this code will do?

How should we
modify it to
have beepers
on the line?

Place Beeper Line

```
import stanford.karel.*;

public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
        while(frontIsClear()) {
            putBeeper();
            move();
        }
        // extra put beeper
        putBeeper();
    }
}
```



Place Beeper Line

```
import stanford.karel.*;

public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
        while(frontIsClear()) {
            putBeeper();
            move();
        }
        // extra put beeper
        putBeeper();
    }
}
```



Place Beeper Line

```
import stanford.karel.*;

public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
        while(frontIsClear()) {
            putBeeper();
            move();
        }
        // extra put beeper
        putBeeper();
    }
}
```



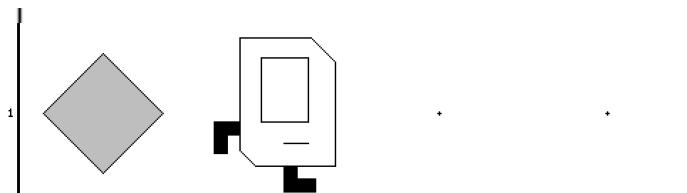
Place Beeper Line

```
import stanford.karel.*;

public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
        while(frontIsClear()) {
            putBeeper();
            move();
        }
        // extra put beeper
        putBeeper();
    }
}
```



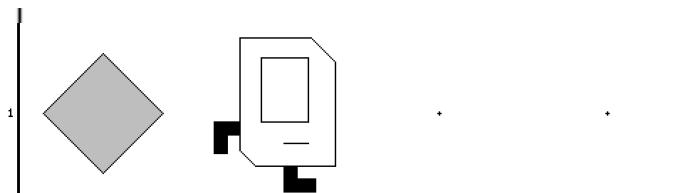
Place Beeper Line

```
import stanford.karel.*;

public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
        while(frontIsClear()) {
            putBeeper();
            move();
        }
        // extra put beeper
        putBeeper();
    }
}
```



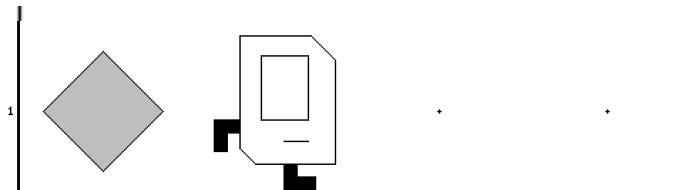
Place Beeper Line

```
import stanford.karel.*;

public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
        while(frontIsClear()) {
            putBeeper();
            move();
        }
        // extra put beeper
        putBeeper();
    }
}
```



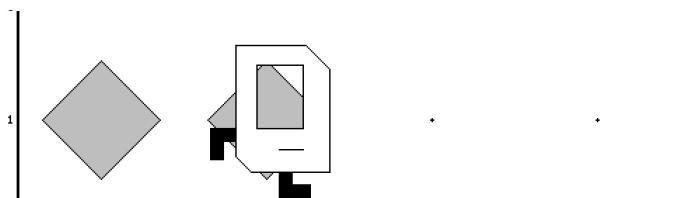
Place Beeper Line

```
import stanford.karel.*;

public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
        while(frontIsClear()) {
            putBeeper();
            move();
        }
        // extra put beeper
        putBeeper();
    }
}
```



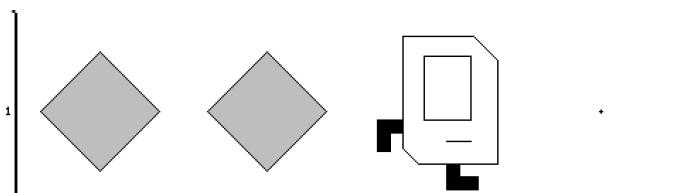
Place Beeper Line

```
import stanford.karel.*;

public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
        while(frontIsClear()) {
            putBeeper();
            move();
        }
        // extra put beeper
        putBeeper();
    }
}
```



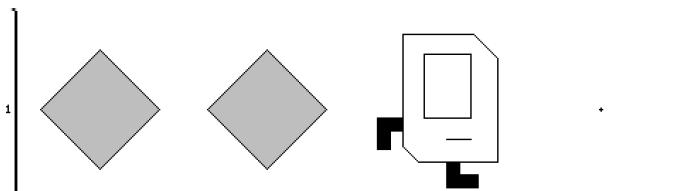
Place Beeper Line

```
import stanford.karel.*;

public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
        while(frontIsClear()) {
            putBeeper();
            move();
        }
        // extra put beeper
        putBeeper();
    }
}
```



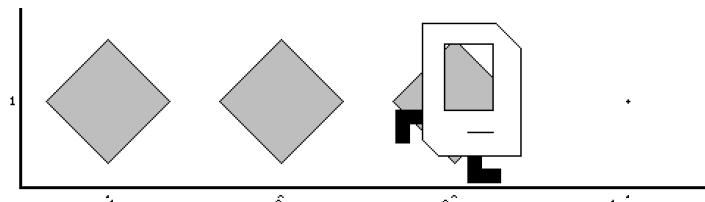
Place Beeper Line

```
import stanford.karel.*;

public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
        while(frontIsClear()) {
            putBeeper();
            move();
        }
        // extra put beeper
        putBeeper();
    }
}
```



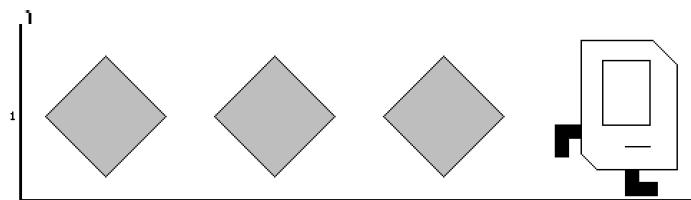
Place Beeper Line

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public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
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            putBeeper();
            move();
        }
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        putBeeper();
    }
}
```



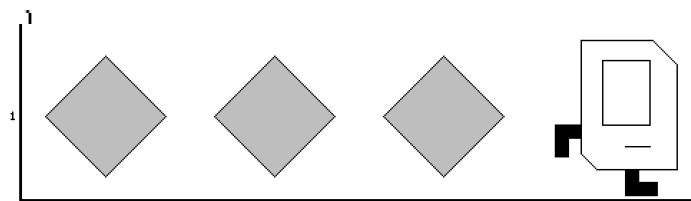
Place Beeper Line

```
import stanford.karel.*;

public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
        while(frontIsClear()) {
            putBeeper();
            move();
        }
        // extra put beeper
        putBeeper();
    }
}
```



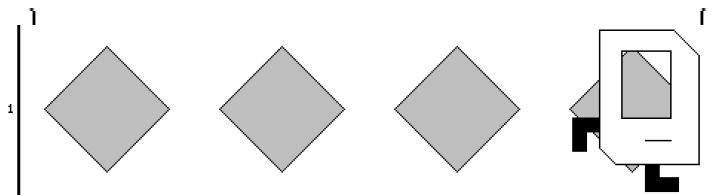
Place Beeper Line

```
import stanford.karel.*;

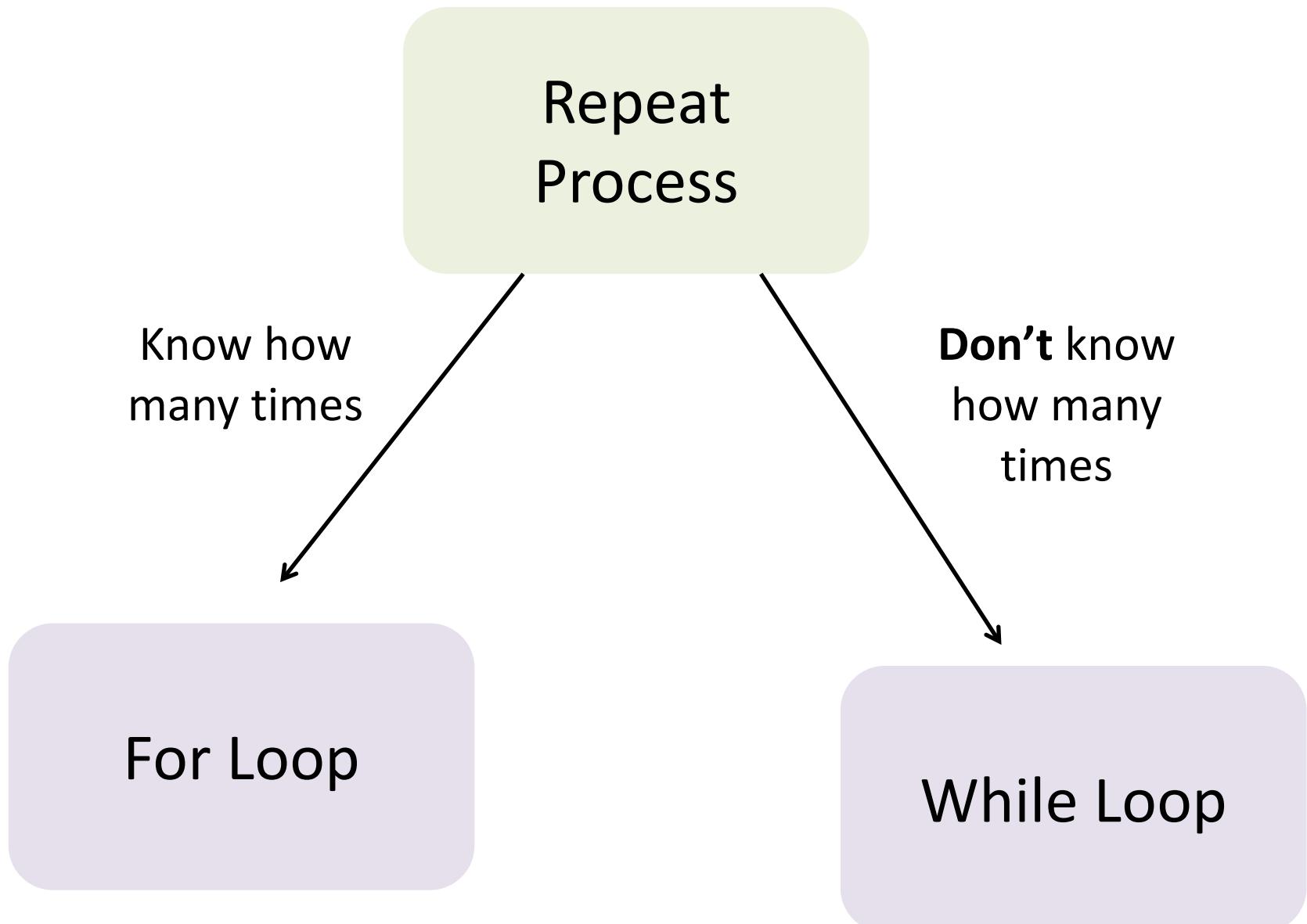
public class BeeperLine extends SuperKarel {

    public void run() {

        // example while loop
        while(frontIsClear()) {
            putBeeper();
            move();
        }
        // extra put beeper
        putBeeper();
    }
}
```



Which Loop



What if you only want to perform a single loop based on a condition?

If statement

If Statement

```
import stanford.karel.*;  
  
public class IfExample extends SuperKarel {  
  
    public void run() {  
  
        // example of an if statement  
        if(condition) {  
            code to run if condition is true  
        }  
  
    }  
}
```

If Statement

```
import stanford.karel.*;

public class IfExample extends CSBridgeStudent{

    public void run() {

        // example of an if statement
        if(youAreInCSBridge()) {
            raiseYourHand();
        }

    }
}
```

**Assume yourself as Karel and
execute this program!**

Let's teach Karel to be more carefully and stop killing itself trying to go through the walls.

Could there be a safer way to move?

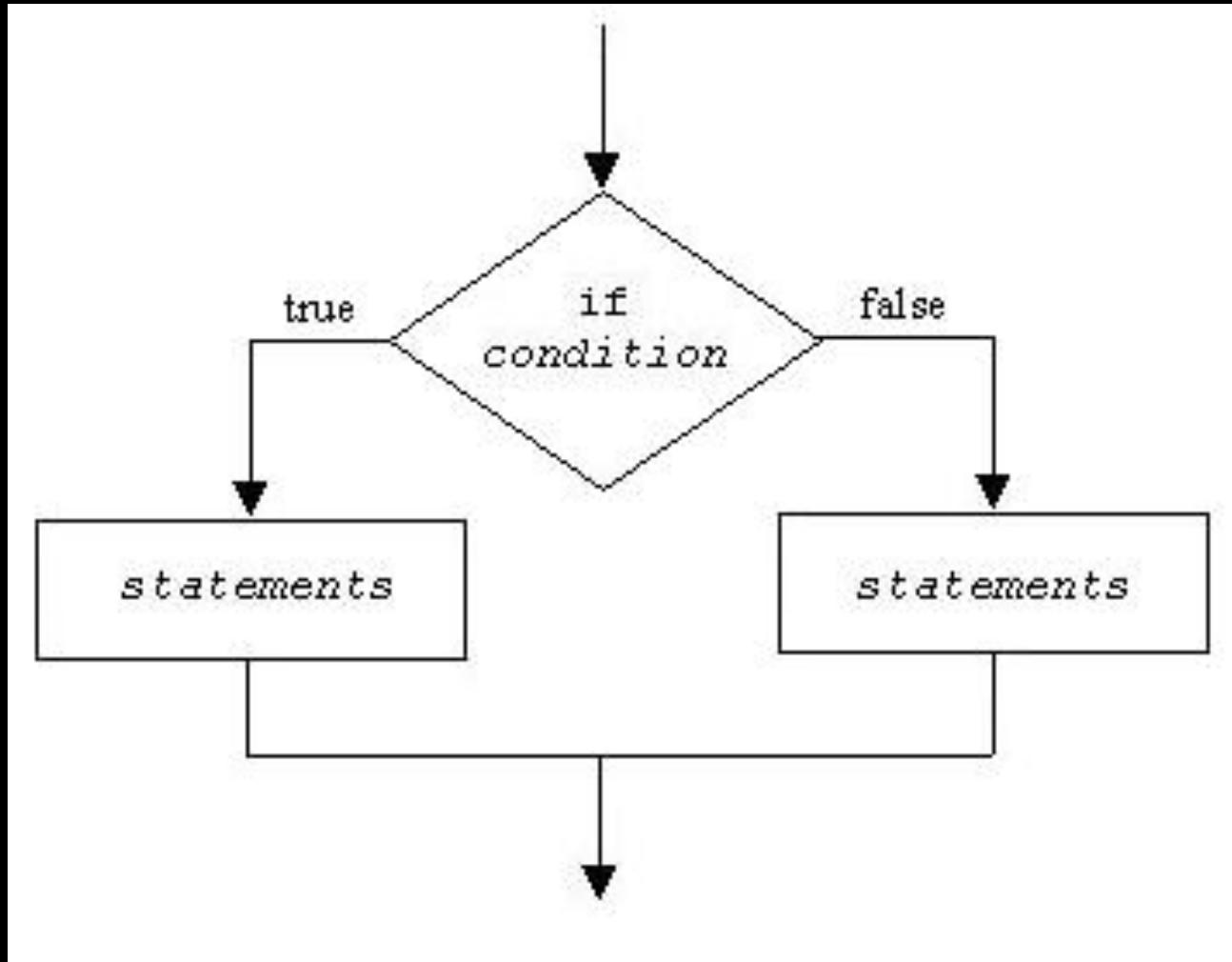
If Statement

```
import stanford.karel.*;  
  
public class IfExample extends SuperKarel{  
  
    public void run() {  
        safeMove();  
    }  
  
    private void safeMove() {  
        if(frontIsClear()) {  
            move();  
        }  
    }  
}  
}
```

We can also specify what will happens if the condition is false



If else statement



Karel goes to the army:

- If there is beeper take it
- If there is no beeper put one

... silly? That's the point!

If / Else Statement

```
import stanford.karel.*;  
  
public class IfExample extends SuperKarel{  
  
    public void run() {  
        invertBeeper();  
    }  
  
    private void invertBeeper() {  
        if(beeperPresent()) {  
            pickBeeper();  
        } else {  
            putBeeper();  
        }  
    }  
}  
}
```

Karel Conditions

The screenshot shows a web browser window with the URL koc.csbridge.org in the address bar. The page content is about Karel conditions, featuring sections on built-in commands, program structure, conditional statements, iterative statements, and method definitions. A red arrow highlights the 'Karel Reference' link in the 'Handouts' dropdown menu.

Built-in Karel commands:

```
move();
turnLeft();
putBeeper();
pickBeeper();
```

Karel program structure:

```
/*
 * Comments may be included anywhere in
 * the program between a slash-star and
 * the corresponding star-slash characters.
 */
import stanford.karel.*;

/* Definition of the new class */

public class name extends Karel {
    public void run() {
        statements in the body of the method
    }
}
```

Conditional statements:

```
if (condition) {
    statements executed if condition is true
}

if (condition) {
    statements executed if condition is true
} else {
    statements executed if condition is false
}
```

Iterative statements:

```
for (int i = 0; i < count; i++) {
    statements to be repeated
}

while (condition) {
    statements to be repeated
}
```

Method definition:

```
public void method_name() {
    statements in the body of the method
}
```

Navigation and Language:

- CS Bridge
- Handouts ▾
- Projects ▾
- Examples ▾
- Slides ▾
- Bonus ▾
- EN
- TR

Inbox (6) - baris.bozkurt@upf.edu - UNIVERSITAT POMPEU FAB...

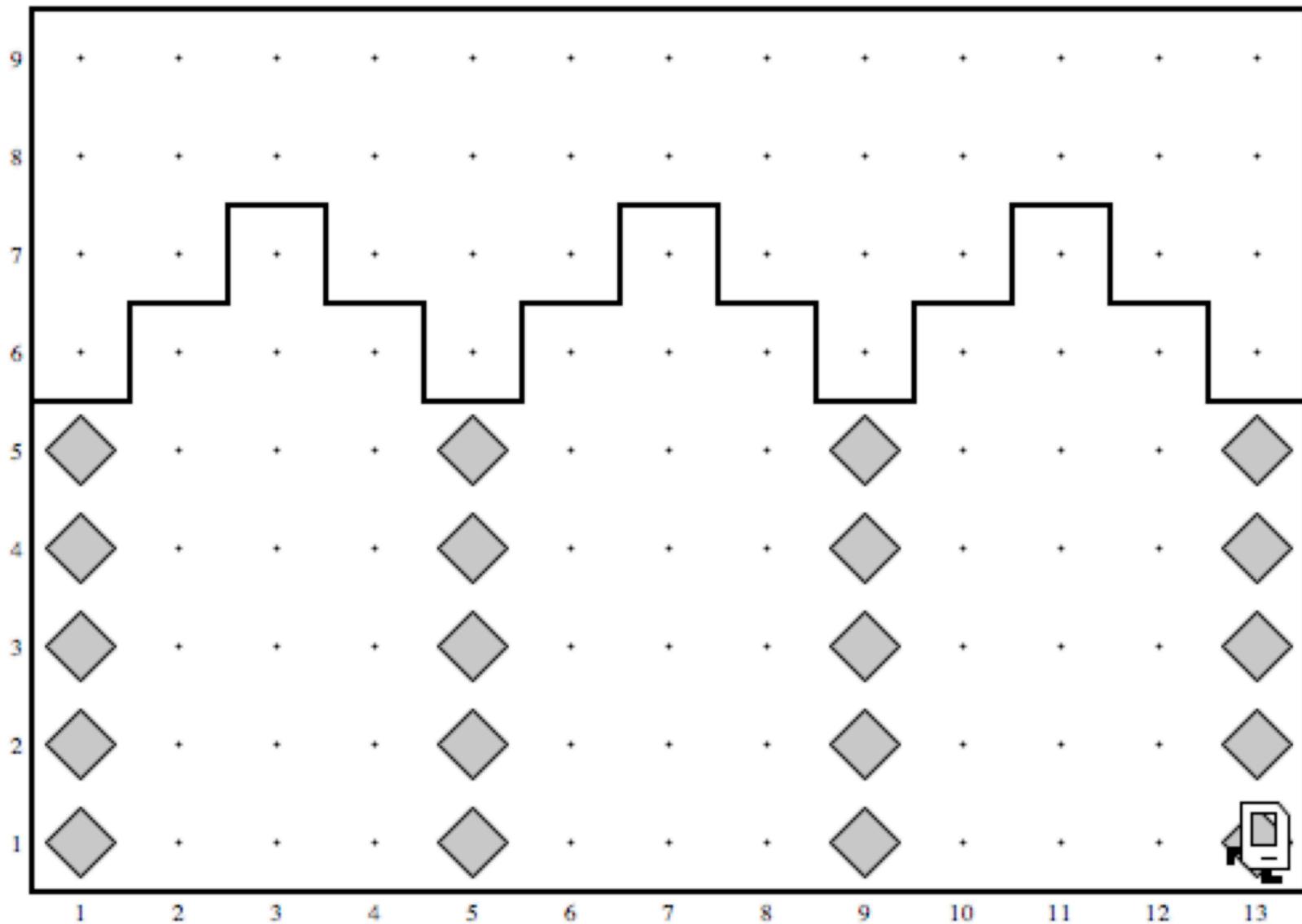
Intro to CS

Tureng - decrement - Turkish

koc.csbridge.org/en/handouts/karel.html#

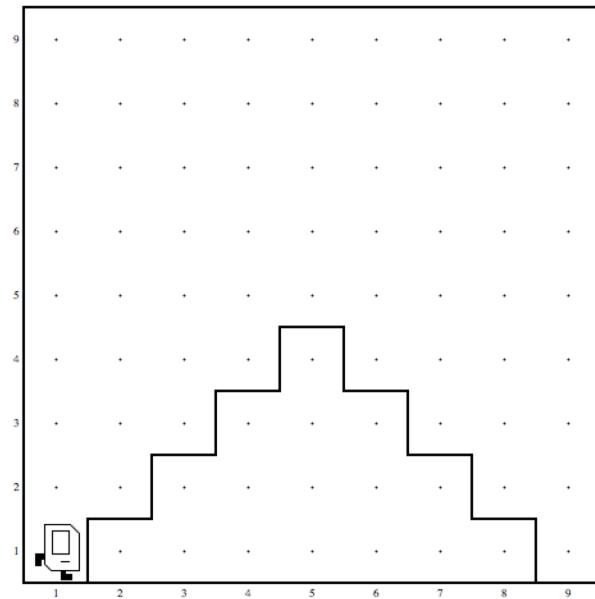
Your tasks this afternoon

1. Program Build Efes Karel

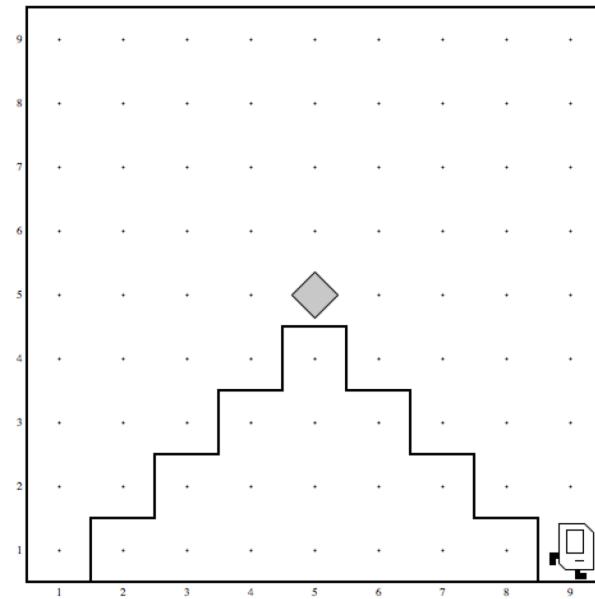


2. Mountain Karel

Before

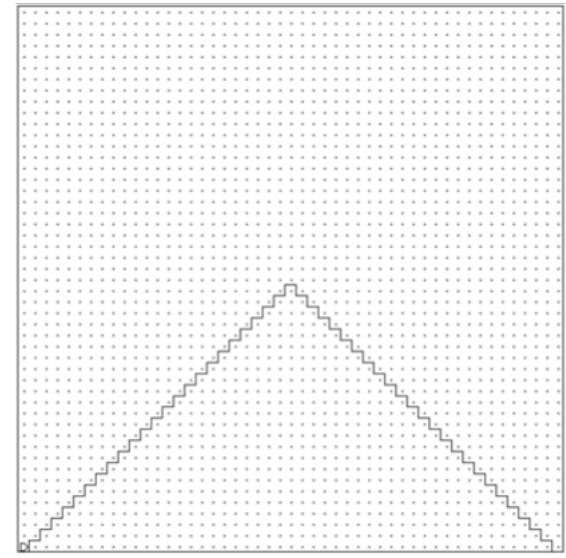
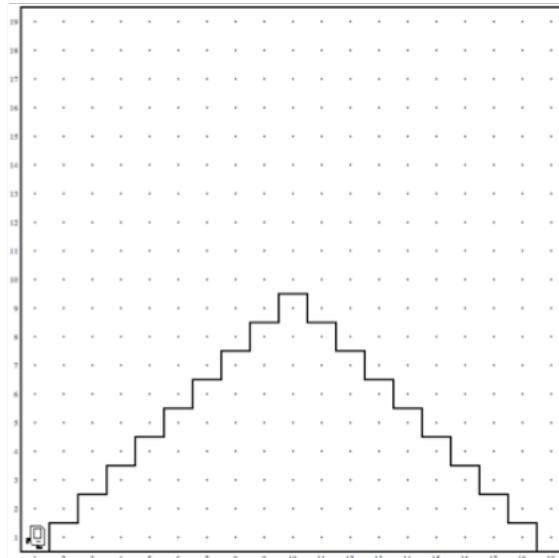
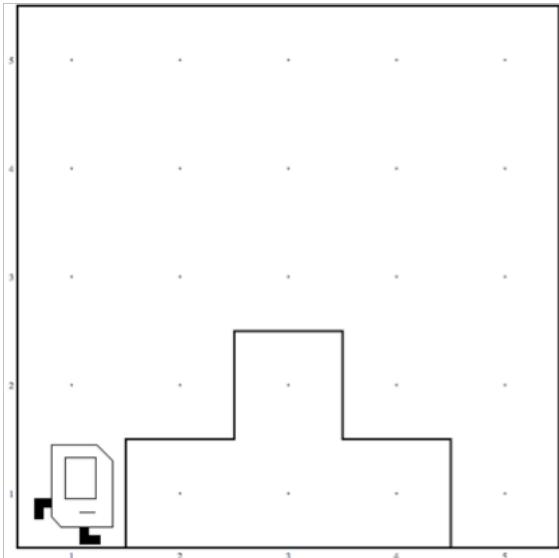


After

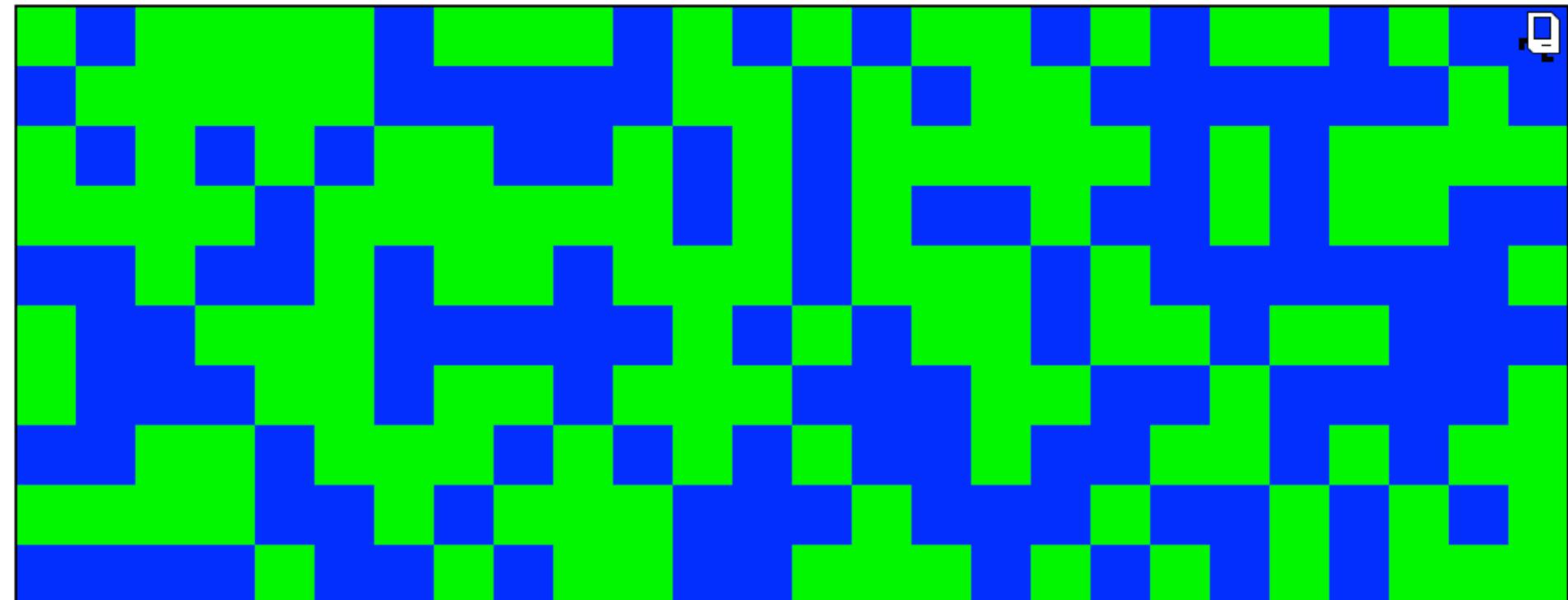


2. Mountain Karel

Should work on a world
of any size 😊



3. Random Painter



What if I finish early?



Intro to Computer Science

Summer 2017

July 3rd to July 13th at Koç University, Istanbul

Sign in to lab here: <http://bit.ly/2udfJA0>

The Idea of the Course

The point of this two week course is to teach you the fundamentals of computer programming to the point where you can go and learn on your own. It is taught by a collaboration of instructors from Stanford, Boğaziçi and Koç University. You will learn to program using material for Stanford's Introduction to Computer Science course (which is very similar to the Koç intro course).

Programs

Name	Topic	Starter Code
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