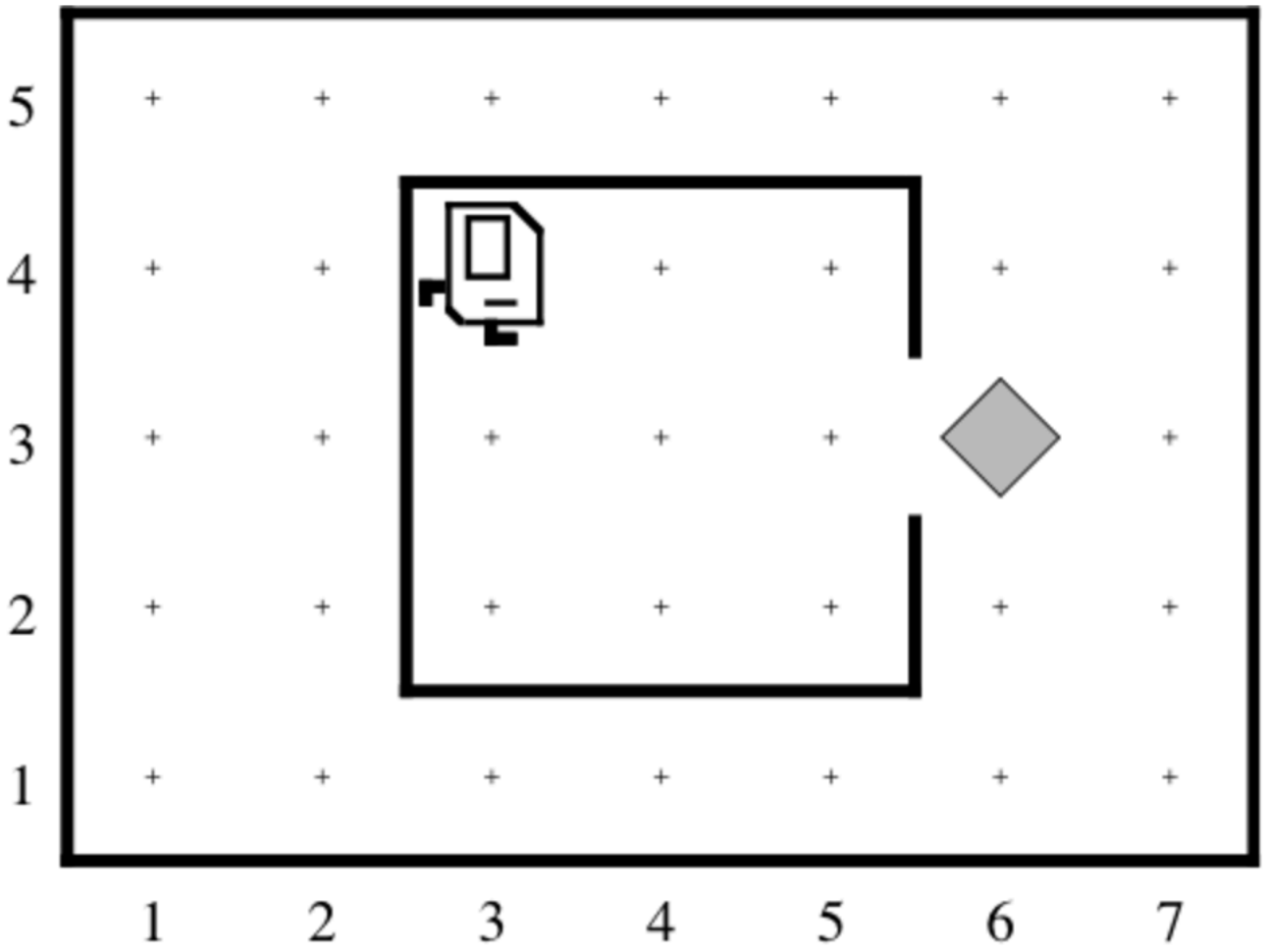

Control Flow

Before we start:

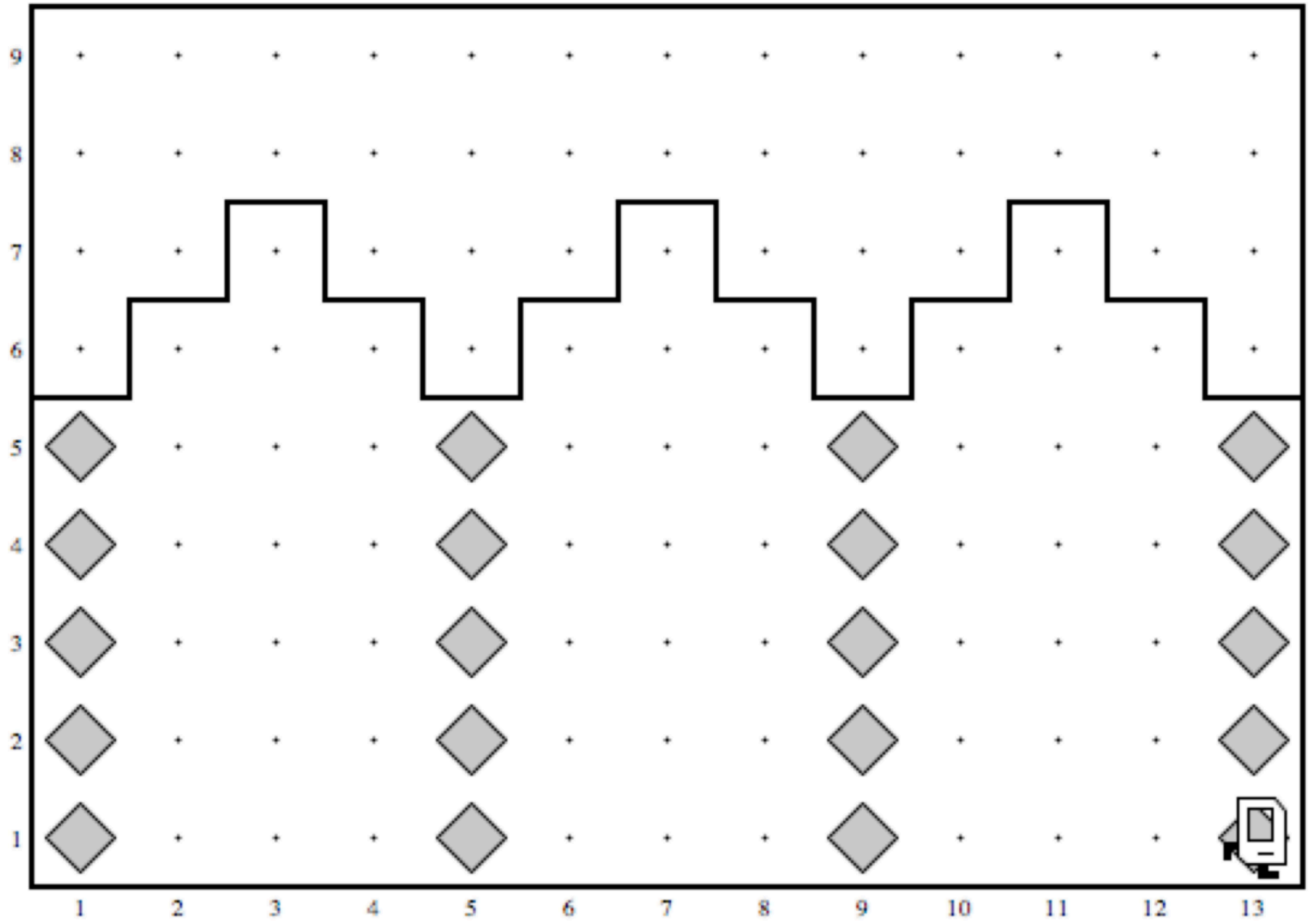
Any questions on Karel?

Newspaper Karel



Any trouble implementing this task?

Karel can also repair Karlův!



That’s fun!...

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


2
1

…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 :

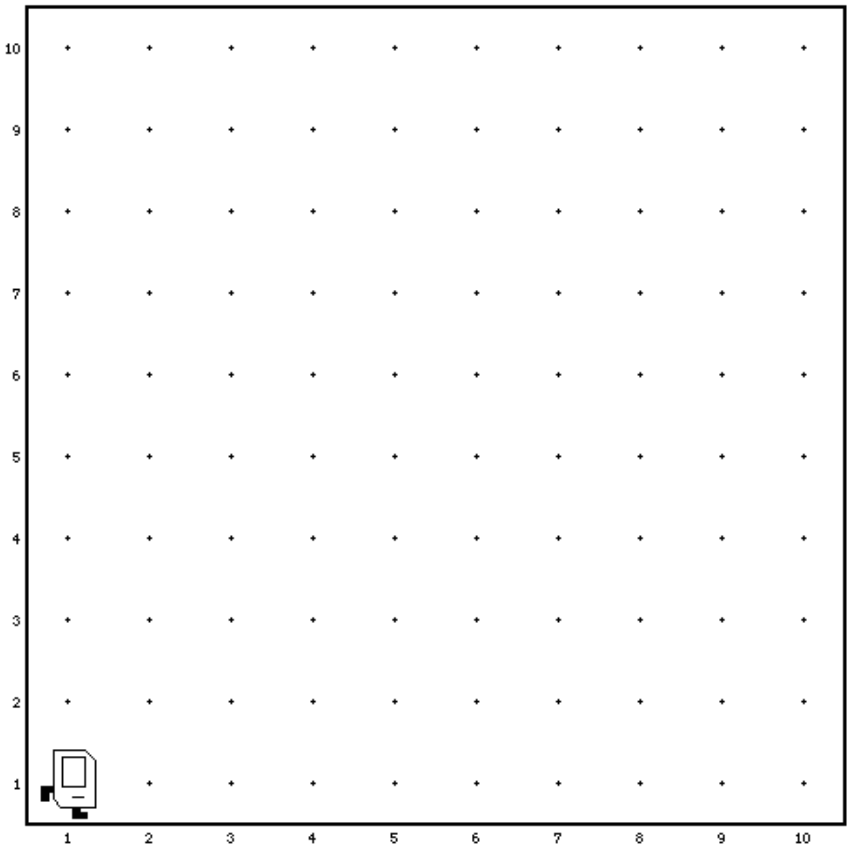
…count the steps
…check what's around
…adjust to the environment

But first:

Who likes dancing here?

Dancing Karel

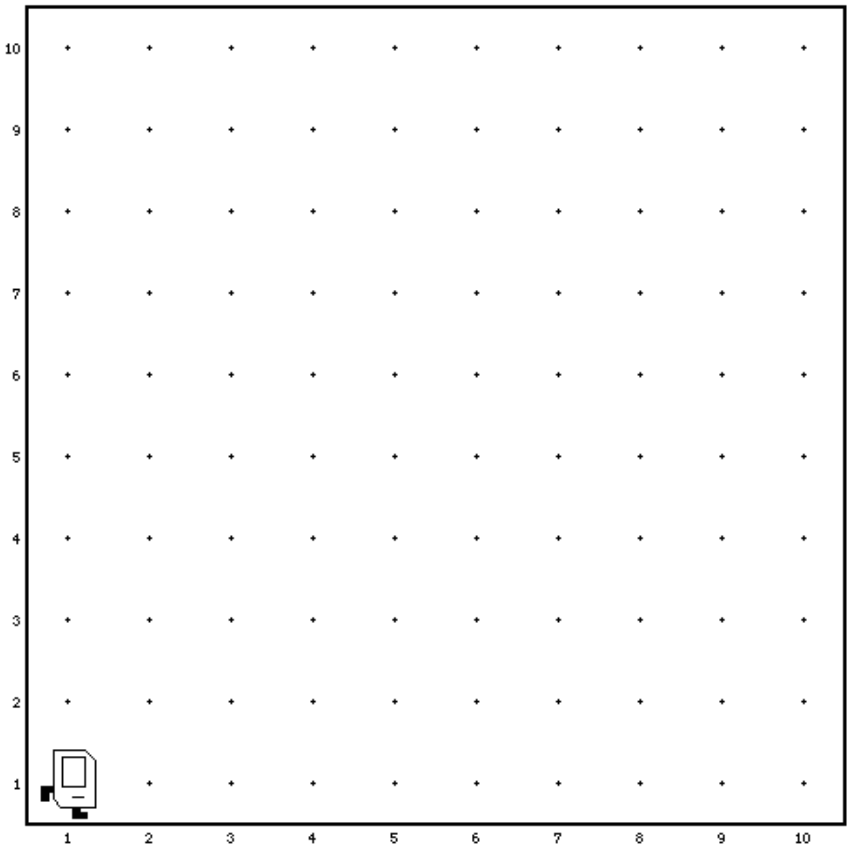
```
import stanford.karel.*;
public class DancingKarel extends SuperKarel {

    public void run() {
        dance();
        dance();
        dance();
        dance();
    }

    private void dance() {
        move();
        move();
        turnLeft();
    }
}
```



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

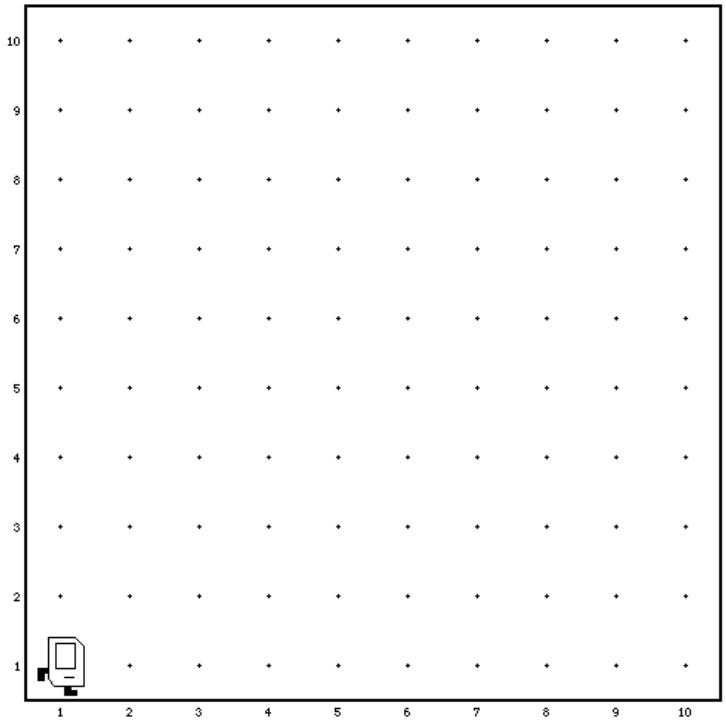
Dancing Karel

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

    public void run() {
        for(int i=0;i<4;i++) {
            dance();
        }
    }

    private void dance() {
        move();
        move();
        turnLeft();
    }
}
```

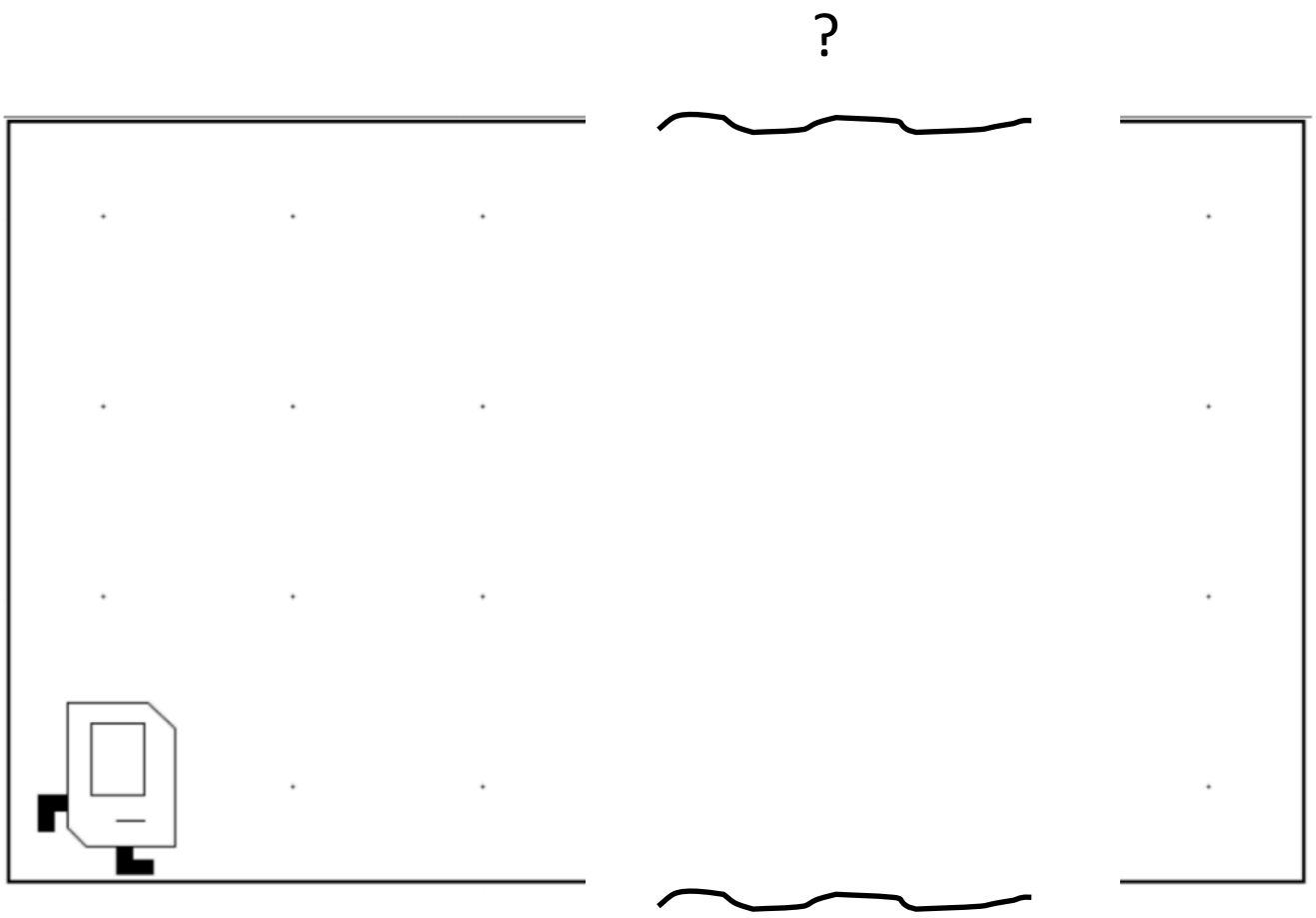


Dancing Karel

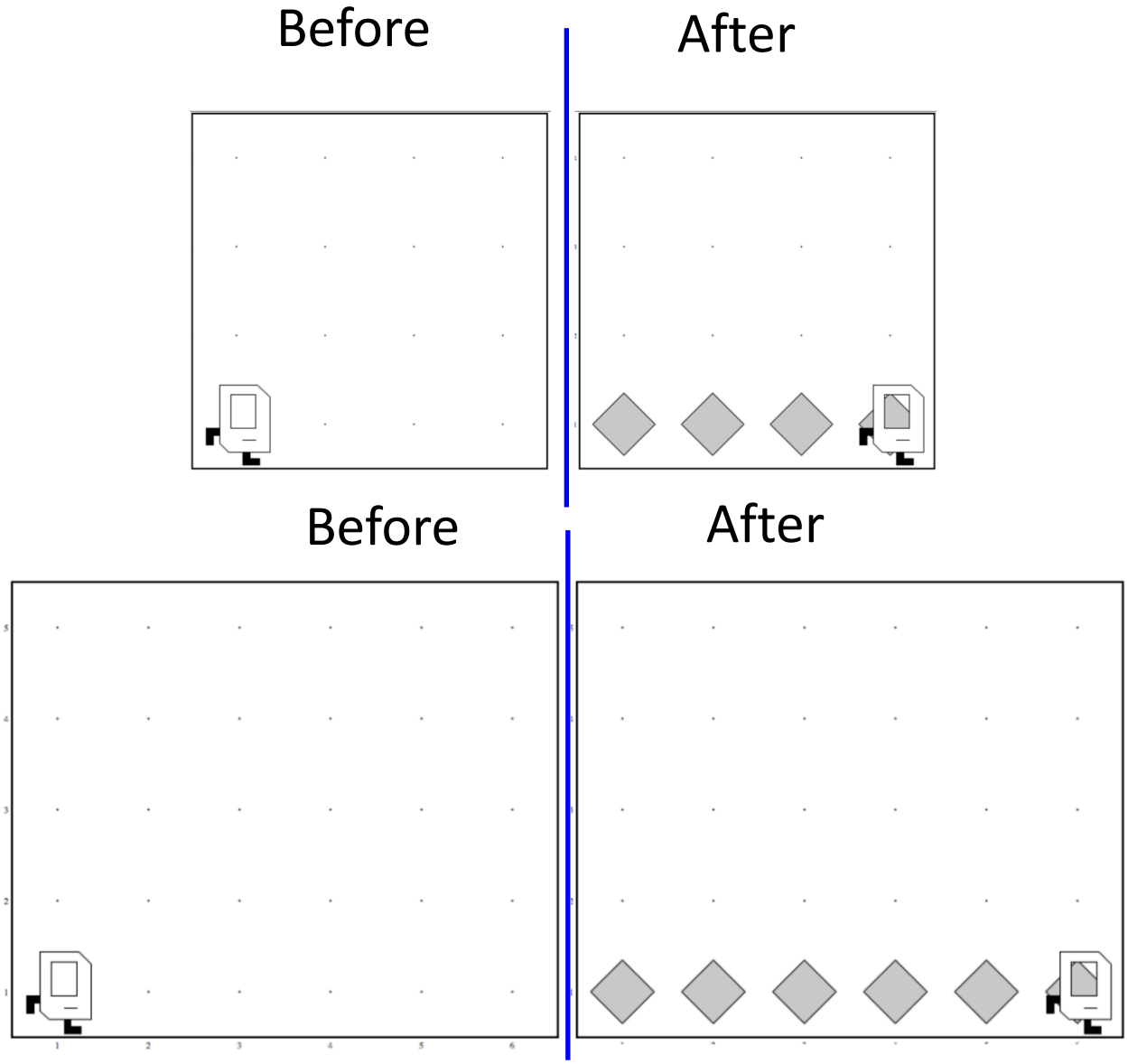
```
import stanford.karel.*;
public class DancingKarel extends SuperKarel {

    public void run() {
        for(int i=0;i<4;i++) {
            for(int k=0;k<4;k++) {
               dance();
            }
        }
    }
}
```



Don’t Know World Size



Work in Any World



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
        putBeeper();
    }

}
```

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()) {
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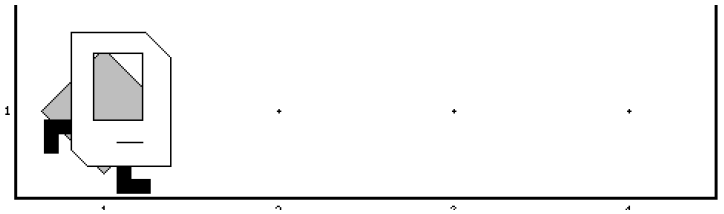

Place Beeper Line

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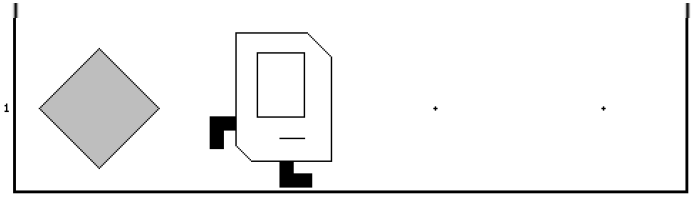

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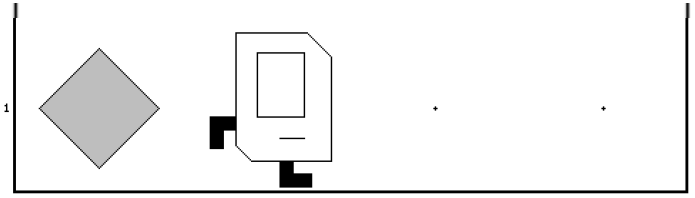

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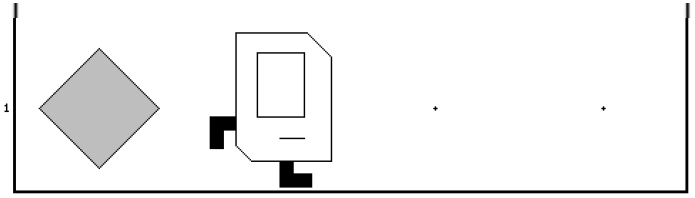

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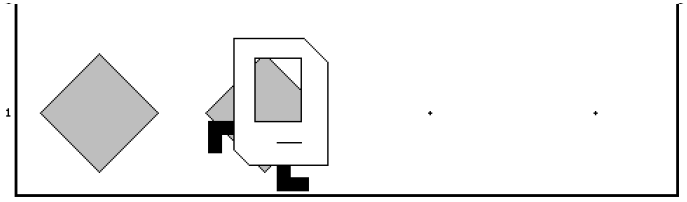

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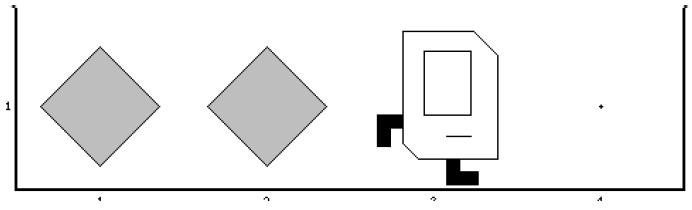

Place Beeper Line

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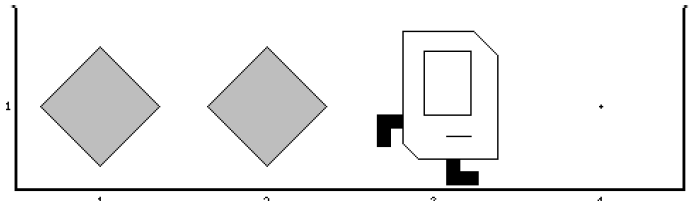

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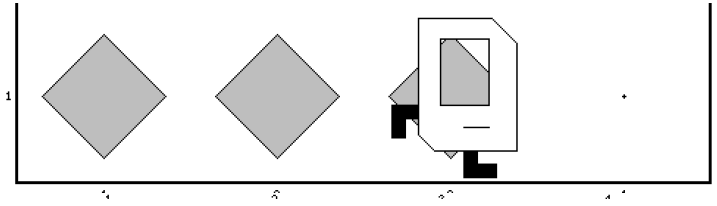

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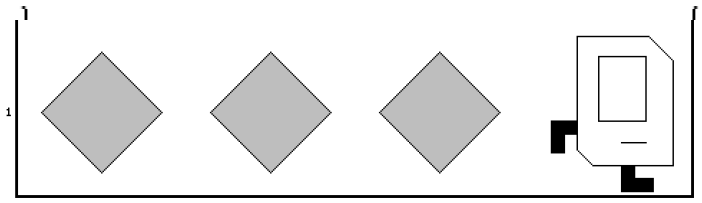

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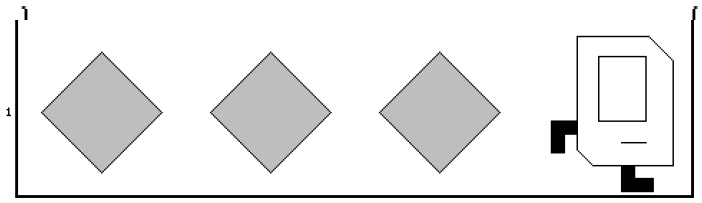

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```
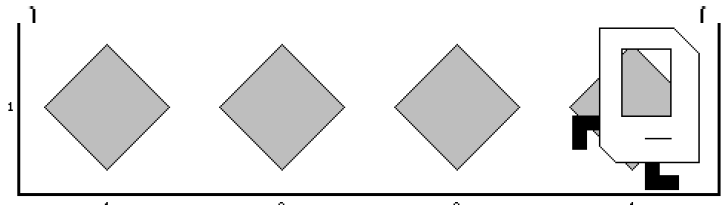
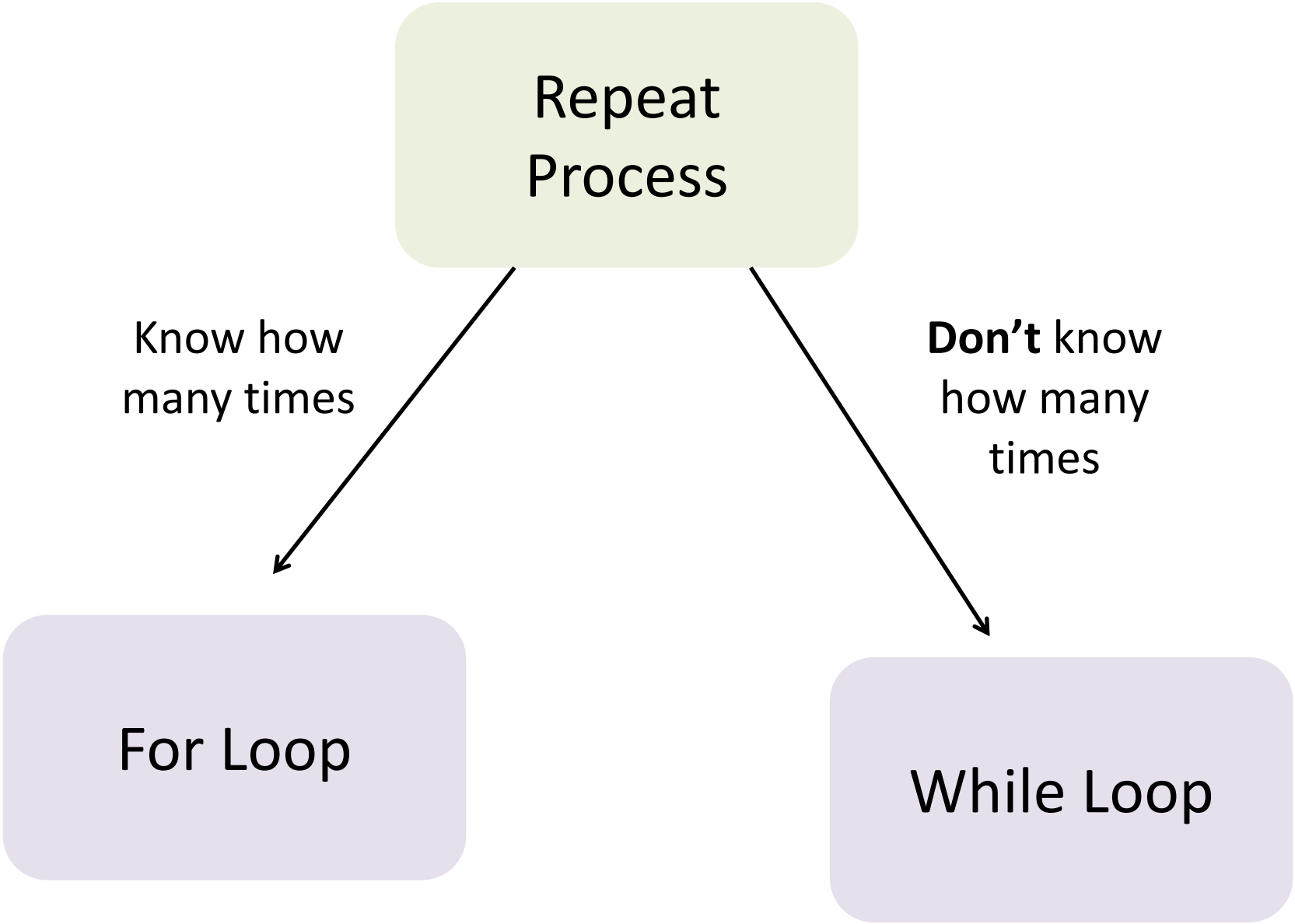



Which Loop


Repeat Process
Know how many times
Don't know how many times
For Loop
While Loop

What if you only want to perform something once 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 careful and stop killing itself trying to go through walls.

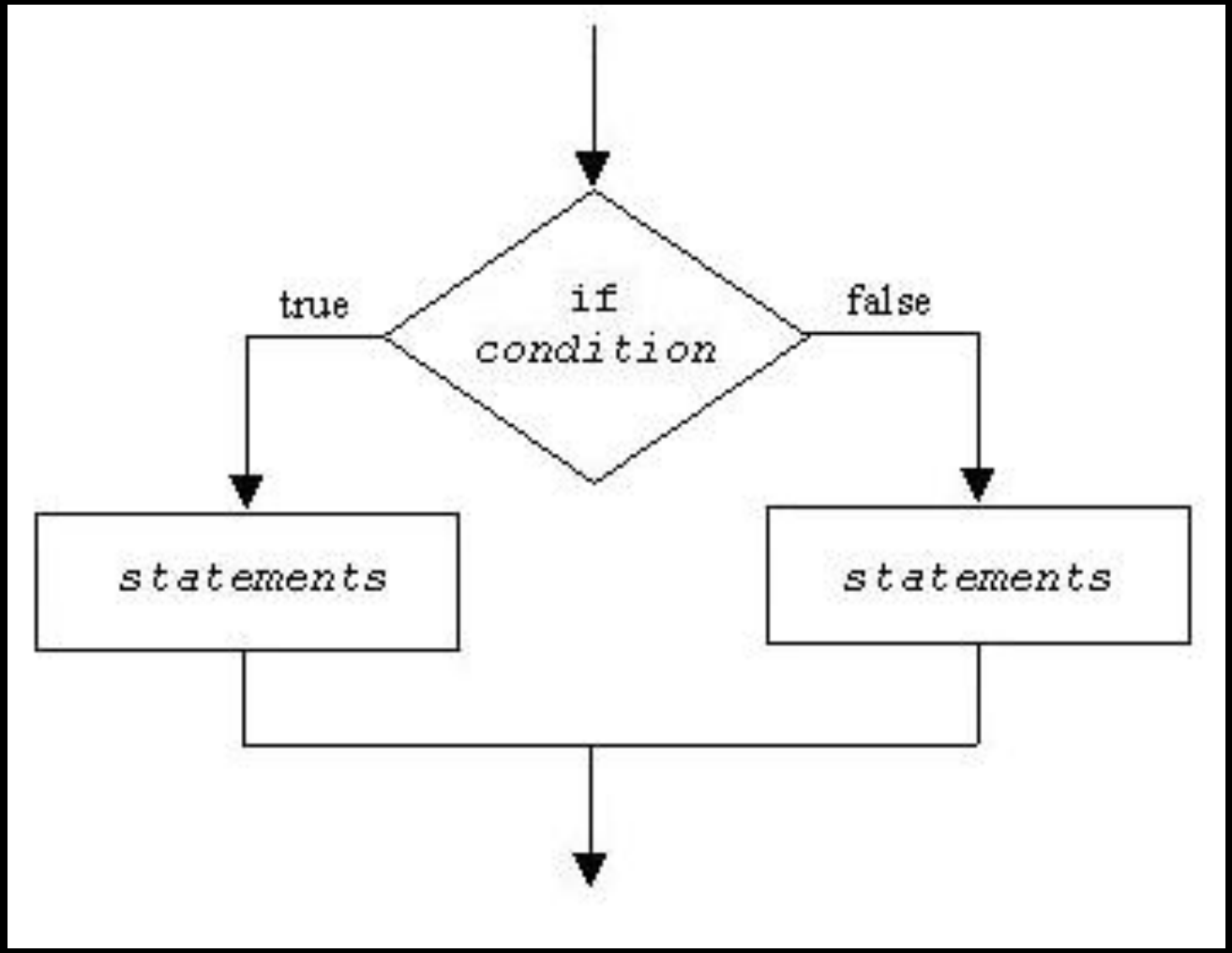
Could there be a safer way to move?

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 happen if the condition is false

If-else statement



Karel goes to the army:

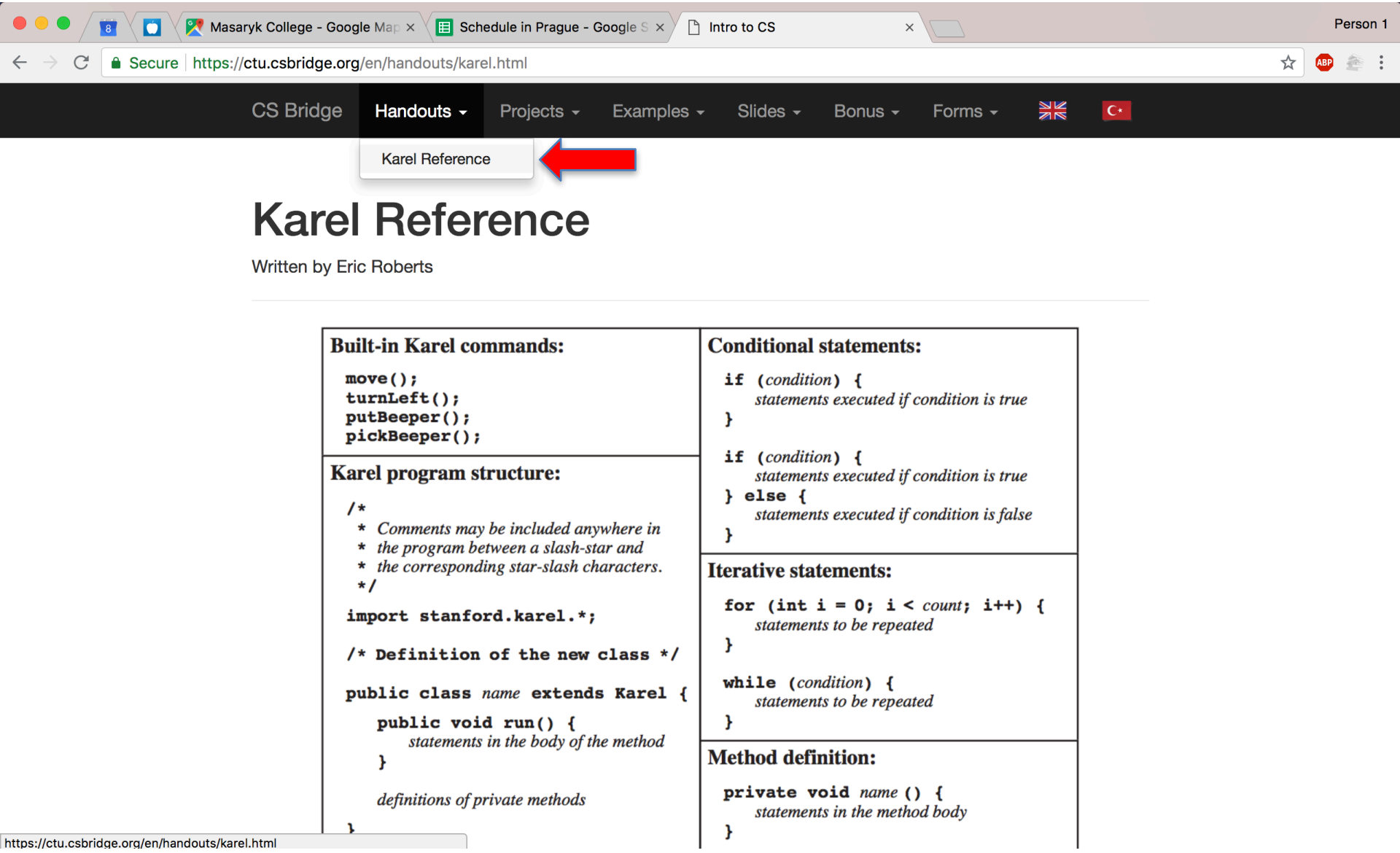
- If there is beeper take it
- If there is no beeper put one

… silly? That's the point!

If / Else Statement

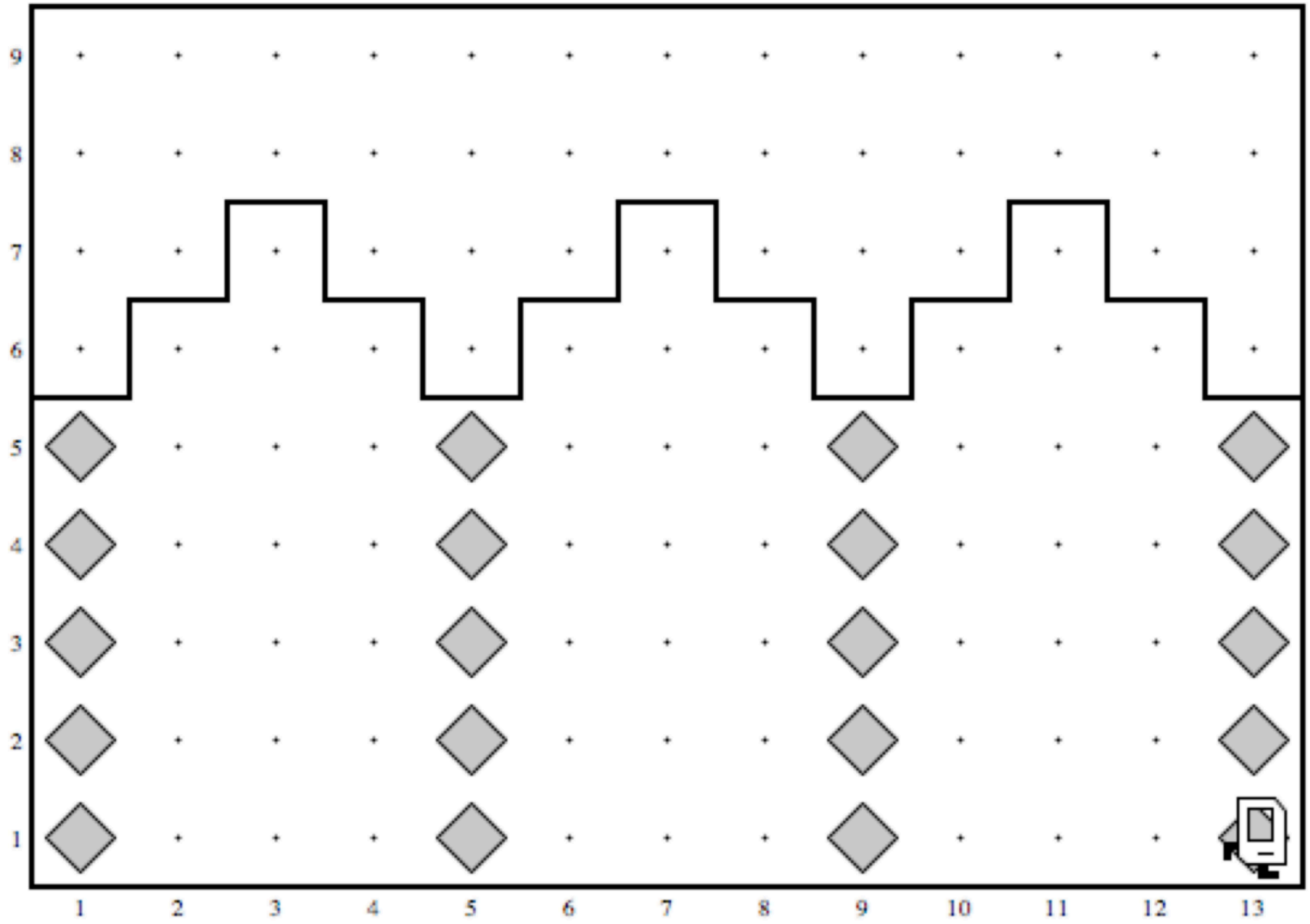
```
import stanford.karel.*;

public class IfExample extends SuperKarel{

    public void run() {
        invertBeeper();
    }

    private void invertBeeper() {
        if(beeperPresent()) {
            pickBeeper();
        } else {
            putBeeper();
        }
    }

}
```

Karel Conditions



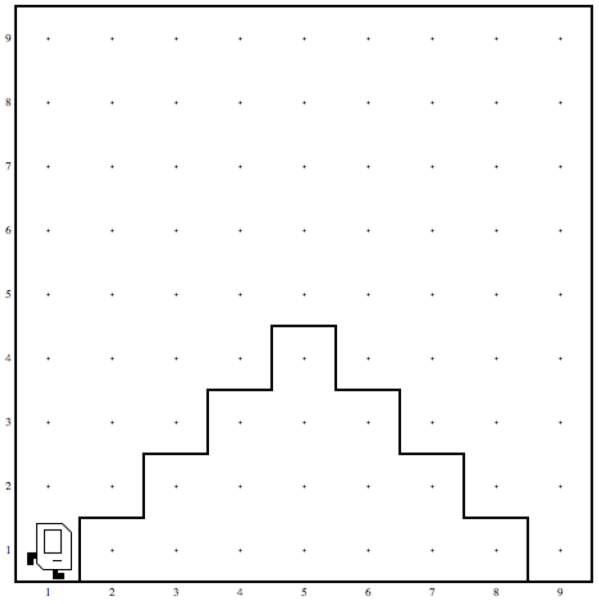
Your tasks this afternoon

1. Build Karlův Karel

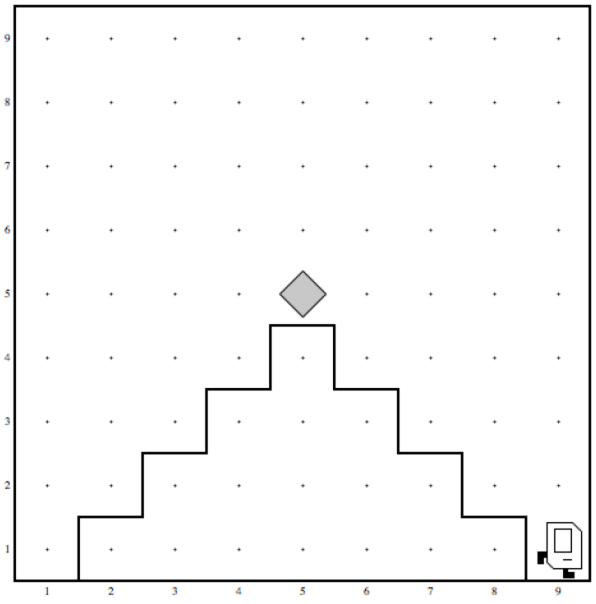


2. Mountain Karel

Before

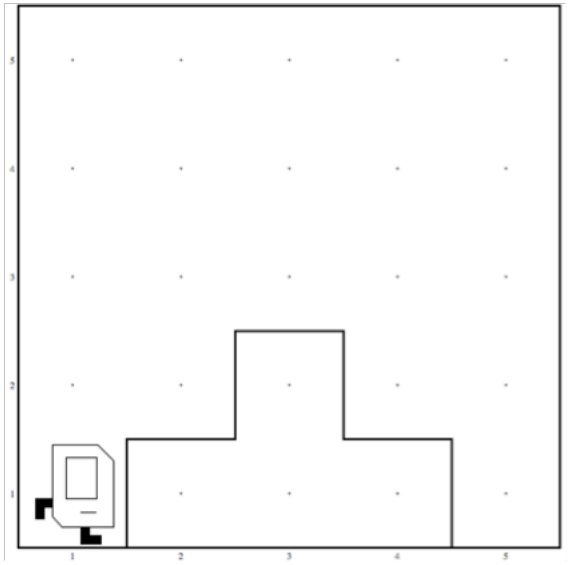


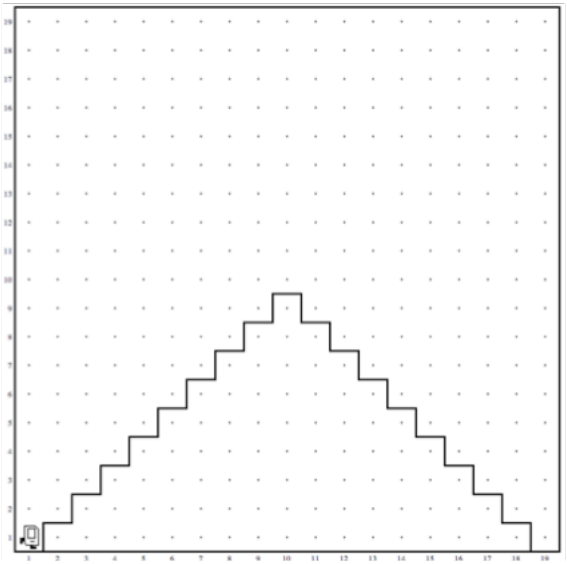
After

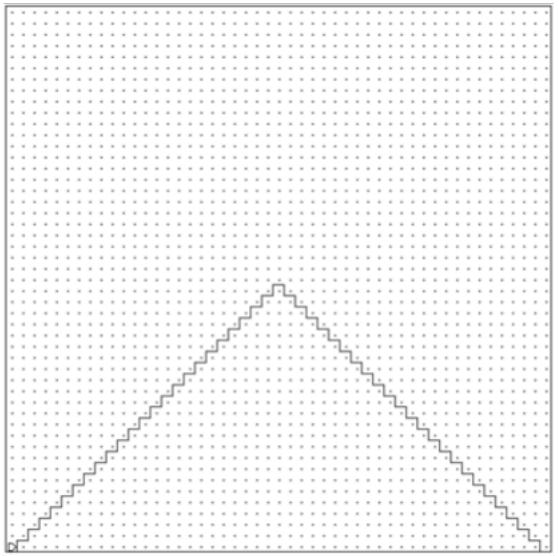


2. Mountain Karel

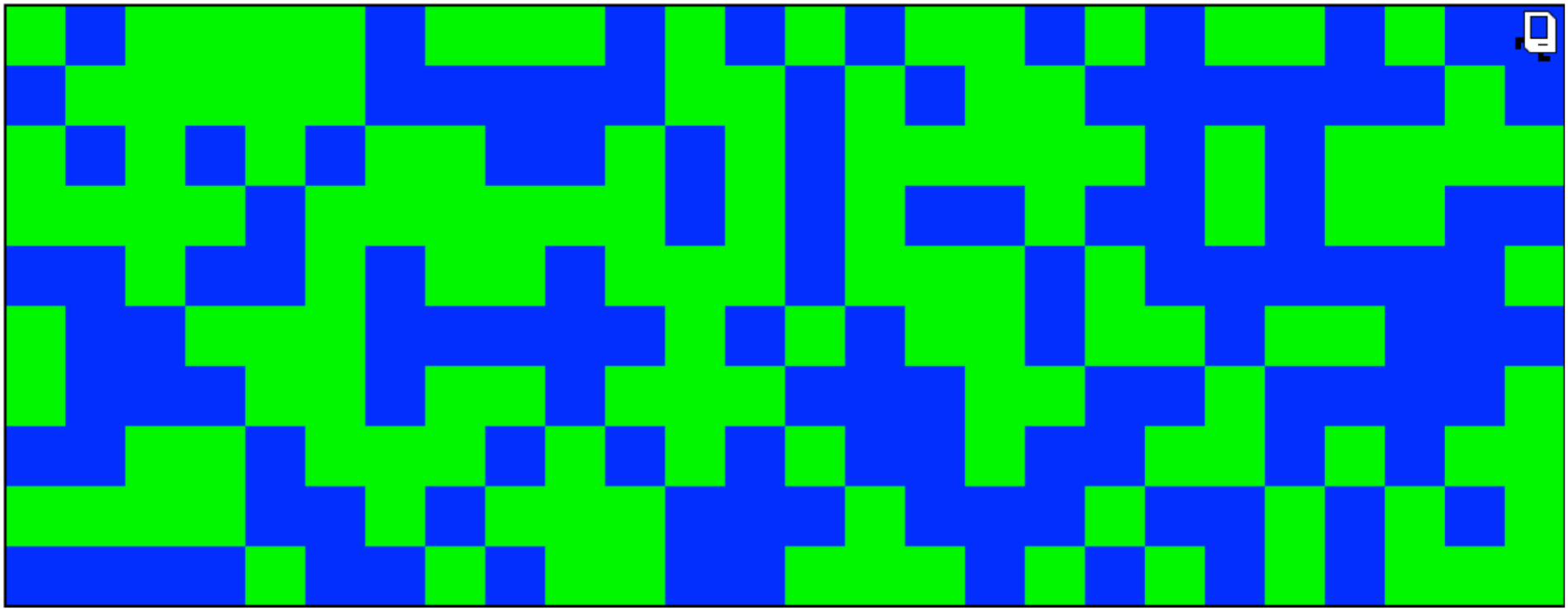
Should work on a world
of any size ☺







3. Random Painter



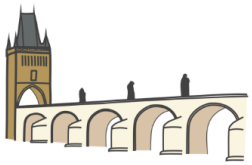
What if I finish early?

Masaryk College - Google Map | Schedule in Prague - Google S | Intro to CS | Person 1

Secure https://ctu.csbridge.org/en/index.html

CS Bridge | Handouts | Projects | Examples | Slides | Bonus

Bonus overview



Intro to Computer Science

Summer 2018

July 10th to July 20th at Czech Technical University in Prague

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 and Czech Technical University in Prague. You will learn to program using material for Stanford's Introduction to Computer Science course.

Programs

	Name	Topic	Starter Code
[Karel]			
	Collect Newspaper	Methods	Day1.zip

https://ctu.csbridge.org/en/index.html#