

KAREL-THE-ROBOT programming

Basic structure of a program for Karel:

BEGINNING-OF PROGRAM

<definition of new instructions>

BEGINNING-OF-EXECUTION

<executable instructions>

END-OF-EXECUTION

END-OF-PROGRAM

Basic executable instructions:

```
turnleft
move
pickbeeper
putbeeper
turnoff
```

Control instructions

1. Repetition

ITERATE <n> TIMES <instruction>

WHILE <condition> DO <instruction>

2. Selection

IF <condition> THEN <instruction>

IF <condition> THEN
 <instruction>

ELSE
 <instruction>

Conditions that the robot can sense:

front-is-clear	front-is-blocked
left-is-clear	left-is-blocked
right-is-clear	right-is-blocked
back-is-clear	back-is-blocked
next-to-a-beeper	not-next-to-a-beeper
facing-east	not-facing-east
facing-west	not-facing-west
facing-north	not-facing-north
facing-south	not-facing-south
any-beepers-in-beeper-bag	no-beepers-in-beeper-bag

Instructions can be grouped in blocks:

```
BEGIN
    <instruction>;
    etc.
    <instruction>
END
```

New Instructions can be defined:

```
DEFINE-NEW-INSTRUCTION <name> AS
BEGIN
    <instructions>
END;
```

Error conditions in robot execution:

- Move forward into wall
- Put beeper from empty beeper-bag
- Pick beeper from empty corner
- Program terminates without turnoff instruction

