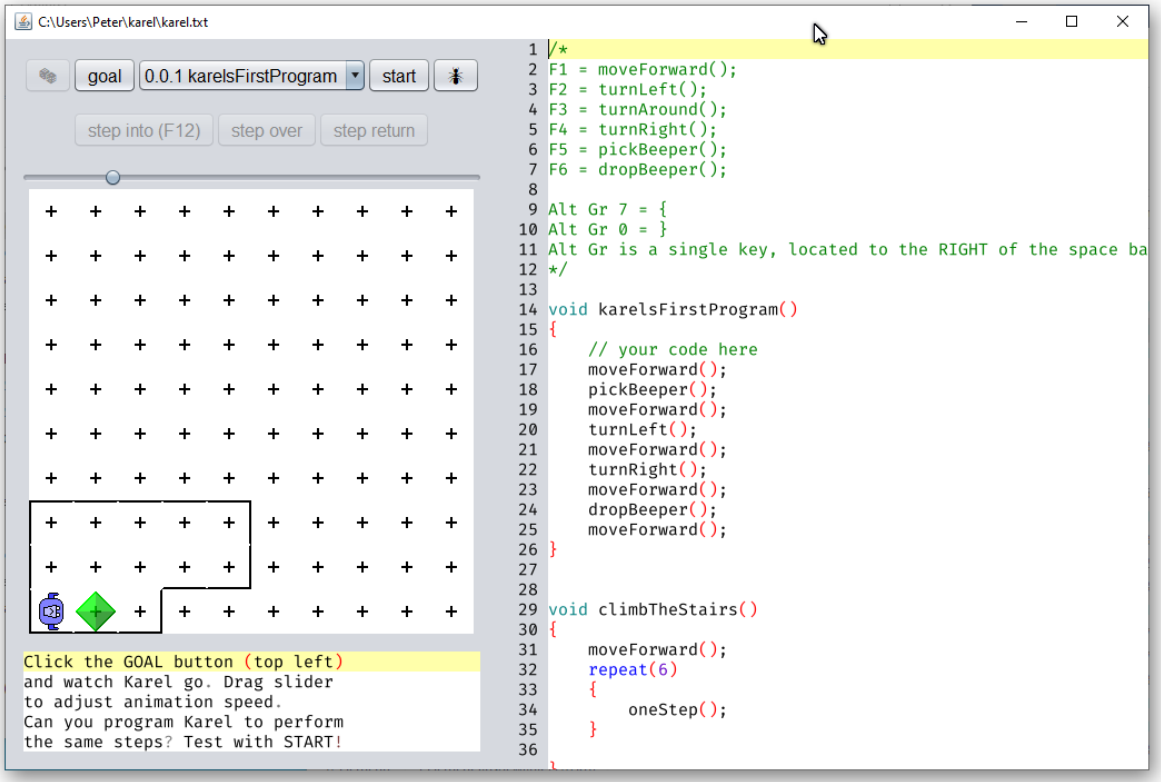
Karel the Robot

Karel the Robot ist ein Spiel mit dem man spielerisch die Grundelemente der Programmiersprachen lernen kann.



Karel the Robot

Karel the Robot ist in Java geschrieben und benötigt eine **Java Runtime Installation**. Wenn kein Java auf dem Rechner vorhanden ist empfiehlt **fredoverflow** dieses freie javakompatible Paket:

https://adoptium.net/

Das Programm selbst kann als **karel.jar** von **fredoverflows** Website bei Github heruntergeladen werden:

https://github.com/fredoverflow/karel

Karel the Robot

- **Einfache Befehle:**

Shortcut	Command	Meaning
• F1	moveForward();	Karel moves one square forward in the direction he currently faces. Fails if a wall blocks the way.
• F2	turnLeft();	Karel turns 90° to the left.
• F3	turnAround();	Karel turns 180° around.
• F4	turnRight();	Karel turns 90° to the right.
• F5	pickBeeper();	Karel picks a beeper from the square he currently stands on. Fails if there is no beeper.
• F6	dropBeeper();	Karel drops a beeper onto the square he currently stands on. Fails if there already is a beeper.

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Einfache Entscheidungen:

Shortcut	Condition	Meaning
• F7	onBeeper()	Karel checks whether a beeper is on the square he currently stands on.
• F8	beeperAhead()	Karel checks whether a beeper is on the square immediately in front of him.
• F9	leftIsClear()	Karel checks whether no wall is between him and the square to his left.
• F10	frontIsClear()	Karel checks whether no wall is between him and the square in front of him.
• F11	rightIsClear()	Karel checks whether no wall is between him and the square to his right.

Karel the Robot

Es lassen sich eigene Befehle schreiben:

Unterprogramme oder **Funktionen**.

```
void roundTrip()
{
    moveForward();
    moveForward();
    moveForward();
    moveForward();
    moveForward();
    moveForward();

    turnAround();

    moveForward();
    moveForward();
    moveForward();
    moveForward();
    moveForward();
    moveForward();
    moveForward();
}
```

```
void moveAcrossWorld()
{
    moveForward();
    moveForward();
    moveForward();
    moveForward();
    moveForward();
    moveForward();
    moveForward();
}

void roundTrip()
{
    moveAcrossWorld();
    turnAround();
    moveAcrossWorld();
}
```

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Wiederholungen oder **Schleifen**:

```
void dance()
{
    moveForward();
    turnLeft();
    moveForward();
    turnLeft();
    moveForward();
    turnLeft();
    moveForward();
    turnLeft();
}
```

```
void dance()
{
    repeat (4)
    {
        moveForward();
        turnLeft();
    }
}
```

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If/else

Hier wird entschieden ob der Beeper aufgehoben oder abgelegt werden soll.

```
if (onBeeper())
{
    pickBeeper();
}
```

```
if (onBeeper())
{
    pickBeeper();
}
else
{
    dropBeeper();
}
```

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If/else if

```
if (leftIsClear())
{
    turnLeft();
}
else
{
    if (rightIsClear())
    {
        turnRight();
    }
}
```

```
if (leftIsClear())
{
    turnLeft();
}
else if (rightIsClear())
{
    turnRight();
}
```

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While

```
void moveToWall()
{
    while (frontIsClear())
    {
        moveForward(); // This line is executed 0 to 9 times
    }
}
```

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Not **!**

```
if (!frontIsClear())
{
    turnRight();
}
```

And **&&**

```
if (frontIsClear() && beeperAhead())
{
    moveForward();
    pickBeeper();
}
```

Or **||**

```
if (!frontIsClear() || beeperAhead())
{
    turnRight();
}
```