

Programmieren in Java

Vorlesung 09: Demo

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Lösungsbeispiel: w08-2 one-d-game

- ▶ Suchproblem
- ▶ Lösungsstrategie: Backtracking
 - ▶ Spielzustand `state`
 - ▶ `legal()` testet, ob ein Zustand gültig ist
 - ▶ `winning()` testet, ob ein Gewinnzustand vorliegt
 - ▶ `tryStep1`, `tryStep2`, ... mögliche Spielzüge

Backtracking

```
solve(state) {  
  if !legal(state) then  
    return TRYNEXT  
  if winning(state) then  
    return SUCCESS  
  r = solve(tryStep1(state))  
  if (r=TRYNEXT) then  
    r = solve(tryStep2(state))  
    ...  
  return r  
}
```

Komponenten fürs Backtracking

state

- ▶ Position i
- ▶ Array visited

legal

$i \geq 0 \dots$

winning

$i \geq n - 1 \dots$

steps

1. $i \leftarrow i + m;$
2. $i \leftarrow i + 1;$
3. $i \leftarrow i - 1$

Demo Time

Aus der Praxis

Rational

```
1 public class Rational {  
2     private long nominator;  
3     private long denominator;  
4     // ...  
5     public Rational simplify() {  
6         long a = this.nominator;  
7         long b = this.denominator;  
8         long c = 1;  
9  
10        while (b != 0) {  
11            c = a % b;  
12            a = b;  
13            b = c;  
14        }  
15  
16        this.nominator /= a;  
17        this.denominator /= a;  
18  
19        return this;  
20    }  
21 }
```


Rational #2

```
1 public class Rational {
2     private long nominator;
3     private long denominator;
4     // ...
5     @Override
6     public boolean equals(Object r) {
7         if (r == this) {
8             return true;
9         }
10        if (!(r instanceof Rational)) {
11            return false;
12        }
13        Rational rational = (Rational) r;
14        return Objects.equals(this.toDouble(), rational.toDouble());
15    }
16 }
17 }
```

Gemischte Suchbäume

- ▶ Rekursive Methoden
- ▶ Die Bedeutung von Immutability
- ▶ Null
- ▶ Interfaces
- ▶ ABM

Fragen

