Mathematik für Informatiker
Kombinatorik, Stochastik und Statistik

Übungsblatt 4

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Aufgabe 5

Code:

```
fn partitions(n: u8, m: u8) -> Vec<Vec<Vec<u8>>> {
    if m == 0 || n == 0 {
        return Vec::new();
    }
    if m == 1 {
        return vec![vec![(1..=n).collect()]];
    }

    let mut result = Vec::new();
    for p in partitions(n - 1, m - 1).iter_mut() {
        p.push(vec![n]);
        result.push(p.clone());
    }
    for p in partitions(n-1, m) {
        for i in 0..p.len() {
            let mut p = p.clone();
            p[i].push(n);
            result.push(p);
        }
    }
    result
}
```

Funktionsaufruf:

```
let parts = partitions(5, 3);

for (i, part) in parts.iter().enumerate() {
    println!("{:3}: {:?}", i, part);
}
```

Ausgabe:

```
  0: [[1, 2, 3], [4], [5]]
  1: [[1, 2, 4], [3], [5]]
  2: [[1, 2], [3, 4], [5]]
  3: [[1, 3, 4], [2], [5]]
  4: [[1, 3], [2, 4], [5]]
  5: [[1, 4], [2, 3], [5]]
  6: [[1], [2, 3, 4], [5]]
  7: [[1, 2, 5], [3], [4]]
  8: [[1, 2], [3, 5], [4]]
  9: [[1, 2], [3], [4, 5]]
```

```
10: [[1, 3, 5], [2], [4]]
11: [[1, 3], [2, 5], [4]]
12: [[1, 3], [2], [4, 5]]
13: [[1, 5], [2, 3], [4]]
14: [[1], [2, 3, 5], [4]]
15: [[1], [2, 3], [4, 5]]
16: [[1, 4, 5], [2], [3]]
17: [[1, 4], [2, 5], [3]]
18: [[1, 4], [2], [3, 5]]
19: [[1, 5], [2, 4], [3]]
20: [[1], [2, 4, 5], [3]]
21: [[1], [2, 4], [3, 5]]
22: [[1, 5], [2], [3, 4]]
23: [[1], [2, 5], [3, 4]]
24: [[1], [2], [3, 4, 5]]
```