279. Perfect Squares

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Description | Hints | Submissions | Discuss | Solution

Pick One

Given a positive integer *n*, find the least number of perfect square numbers (for example, `1, 4, 9, 16, ...`) which sum to *n*.

Example 1:

```
Input: n = 12
Output: 3
Explanation: 12 = 4 + 4 + 4.
```

Example 2:

```
Input: n = 13
Output: 2
Explanation: 13 = 4 + 9.
```

Given a positive integer *n*, find the least number of perfect square numbers (for example, `1, 4, 9, 16, ...`) which sum to *n*.

For example, given *n* = `12`, return`3` because `12 = 4 + 4 + 4`; given *n* = `13`, return`2` because `13 = 4 + 9`.

dp[0] = 0
dp[1] = dp[0]+1 = 1
dp[2] = dp[1]+1 = 2
dp[3] = dp[2]+1 = 3
dp[4] = Min{ dp[4-1*1]+1, dp[4-2*2]+1 }
= Min{ dp[3]+1, dp[0]+1 }
= 1
dp[5] = Min{ dp[5-1*1]+1, dp[5-2*2]+1 }
= Min{ dp[4]+1, dp[1]+1 }
= 2
dp[13] = Min{ dp[13-1*1]+1, dp[13-2*2]+1, dp[13-3*3]+1 }
= Min{ dp[12]+1, dp[9]+1, dp[4]+1 }
= 2
dp[n] = Min{ dp[n - i*i] + 1 }, n - i*i >=0 && i >= 1

递归含义

```java
public class L279 {
/*
 * 这道题目可以用动态规划来表示
 *
 */
    public int numSquares(int n) {

        int [] dp = new int [n + 1];

        for(int i = 1; i <= n; i++) {
              dp[i] = i;
            for(int j = 1; j * j <= i; j ++) {
                dp[i] = Math.min(dp[i - j * j] + 1, dp[i]);
            }
        }
        return dp[n];
    }

}
```