模版·动态规划(01背包问题)

```
public class Knapsack{
    public static int knapsack(Item[] items,int capacity){
        int[][] dp=new int[items.length+1][capacity+1];

        for(int j=0;j<=capacity;j++){
            dp[0][j]=0;
        }

        for(int i=1;i<=items.length;i++){
            Item item=items[i-1];
            for(int j=0;j<=capacity;j++){
                if(item.weight>j){
                    dp[i][j]=dp[i-1][j];
                }else{
                    int includingItem=dp[i-1][j-item.weight]+item.value;
                    int excludingItem=dp[i-1][j];

                    dp[i][j]=Math.max(includingItem,excludingItem);
                }
            }
        }

        return dp[items.length][capacity];
    }

    public static class Item{
        int weight;
        int value;

        public Item(int weight,int value){
```

```
            this.weight=weight;
            this.value=value;
        }
    }

    public static void main(String[] args){
        Item[] items={
            new Item(2,3),
            new Item(3,4),
            new Item(4,5),
            new Item(5,6)
        };

        int capacity=5;

        int maxValue=knapsack(items,capacity);
        System.out.println("可以装进背包的最大价值为:"+maxValue);
    }
}
```