

cp

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1 subset sum

- ◇ subset sum problem: does S have subset that sums exactly to T
- ◇ partition problem: partition S into two subsets such that $sum(S_1) = sum(S_2)$ (special case of subset sum where $T = \frac{1}{2} \times sum(S)$)

1.1 naive $O(2^n)$

```
1 def isSubsetSum(arr, n, target):  
2     if target == 0:  
3         return True  
4     if n == 0 and target != 0:  
5         return False  
6  
7     if arr[n-1] > target:  
8         return isSubsetSum(arr, n-1, target)  
9  
10    return isSubsetSum(arr, n-1, target) or isSubsetSum(arr, n-1, target - arr[n-1])
```

1.2 memoized $O(n * sum)$

1.3 dp with $O(sum)$ space