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Homework 3 – Clever Thief

CS 6515: Introduction to Graduate Algorithms

1.) **Define the entries of your table in words. E.g., T(i) or T(i, j) is ...**

- Let T(i) = be the maximum total profit achievable from robbing houses p_1.....p_i.

2.) **State a recurrence for the entries of your table in terms of smaller subproblems.**

**Base Case(s):** T(0) = 0, T(1) = p[1]

**Recurrence:** T(i) = max{T[i – 1], T[i – 2] + p[i]}, where 2 <= i <= n

3.) **Write pseudocode for your algorithm to solve this problem.**

```
T[0] = 0
T[1] = p[1]
for i = 2 to n:
    T(i) = max{T[i – 1], T[i – 2] + p[i]}
return T[n]
```

4.) **State and analyze the running time of your algorithm.**

- Running one for loop across n-houses takes O(n) time.
- Overall runtime is O(n).

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