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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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