

CS 344 Homework #3

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Question #1

Let a_i = the number of miles from the starting point for the i th hotel.

Let n = the number of hotels we wish to visit.

Let `sequence` be an array of size n

`sequence[0] = 0`

for $i = 1$ to n

 for $j = 0$ to $(i-1)$

`holder[i] = sequence[j] + (200 - (aj - ai)2)`

`sequence[i] = min(holder)`

return `sequence[n]`

Question #2

Let n = number of locations and `p[]` = an array of expected profit at each location

Let `profit[]` be an array of n elements initialized to 0

`within_distance(mi, mj, p[i])`

 if $m_i - m_j < k$

 return 0

 else

 return `p[i]`

for $i = 1$ to $(n-1)$

 for $j = 0$ to $(i-1)$

`temp = profit[j] + within_distance(mi, mj, p[i])`

 if `temp > profit[i]`

`temp = profit[i]`

 if `profit[i] < p[i]`

`profit[i] = p[i]`

Question #3

```
for i = 1 to n
    T[i, i-1] = 0
for i = 0 to (n-1)
    T[i, i] = 1
for i = 0 to (n-1)
    for j = 0 to (n-i)
        k = j + i
        if x[j] = x[k]
            T[j, k] = 2 + T[j+1, k-1]
        else
            T[j, k] = max(T[j+1, k], T[j, k-1])
return T[0, n]
```

Question #4

Let v = the value
Let k = the number of coins or denominations.
Let x = the values of our denominations where x_i is the value of the i th denomination.

```
for j = 1 to k
    T[0, j] = true
for u = 1 to v
    T[u, 0] = false
for j = 1 to k
    for u = 1 to v
        T[u, j] = false
        for i = 1 to n
            if  $u \geq x_i$  and  $T[u-x_i, j-1]$ 
                T[u, j] = true
return T[v, k]
```