# Problem 1

**T(n)=T(n−1)+cn if n>1, and T(1)=c**

| n | T(n) |
|---|---|
| 1 | $C = 1C$ |
| 2 | $C + 2C = 3C$ |
| 3 | $3C + 3C = 6C$ |
| 4 | $6C + 4C = 10C$ |
| 5 | $10C + 5C = 15C$ |
| 6 | $15C + 6C = 21C$ |

The values 1, 3, 6, 10, 15, 21... are so-called triangualr numbers and can be modeled by:

$$T(n) = C(\frac{n(n+1)}{2})$$

In order to find the complexity of $T(n)$ we can simplyfy the right-hand side of the above equation to:

$$T(n) = C(\frac{n^2 + n)}{2})$$

Dropping constants and lower order terms, we can conclude that the complexity of $T(n)$ is:

$$\theta(n^2)$$