

Homework Algorithmics

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Recalls

We recall that the symbol

$$\sum_{k=0}^n 1 = 1 + 1 + \dots + 1 = (n - 0 + 1) = (n + 1).$$

represents the sum for an index k varying from 0 to n . Same is applied here:

$$\sum_{k=1}^n k = 1 + 2 + \dots + n.$$

1 Exercise 1: (10 points)

- We are interested here in the first three sums of powers. Find (and demonstrate) the closest form for the three sums of powers below:

$$S_n := \sum_{k=1}^n k$$

(1.5 pts)

$$T_n := \sum_{k=1}^n k^2$$

(1.5 pts)

$$U_n := \sum_{k=1}^n k^3$$

(1.5 pts)

- Write six algorithms according to the naïve method of calculating the sums and their closest forms. **(0.75 x 6 pts)**
- Comment your results. **(1 pt)**

2 Exercise 2: (10 points)

Write an algorithm using the **elif** statement in order to recognize the "generation" of a person based on their age. The figure below show, in terms of born year, the difference between the six generations.

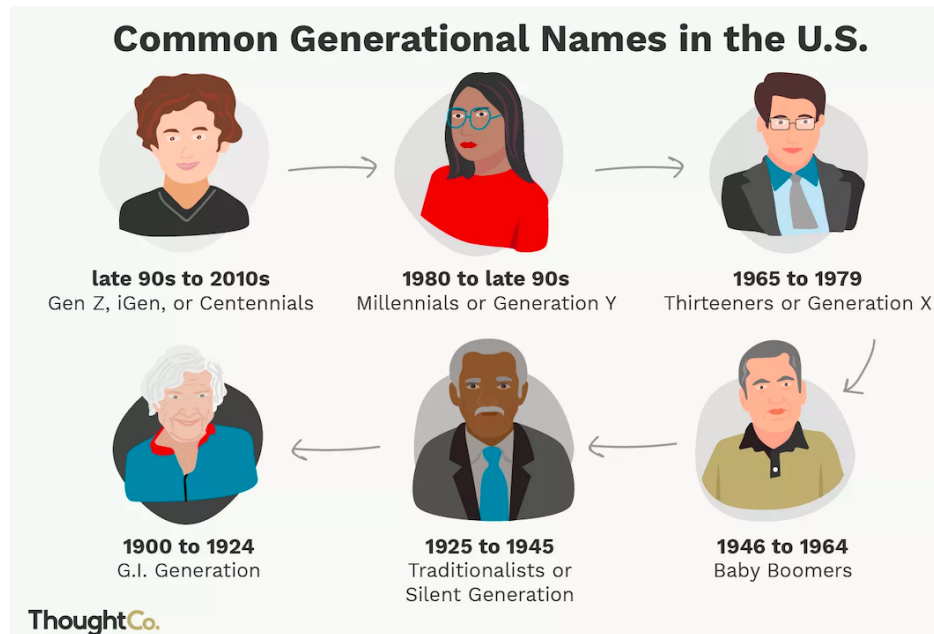


Figure 1: CGN

Good luck! Aaand happy new year 2023 ♥