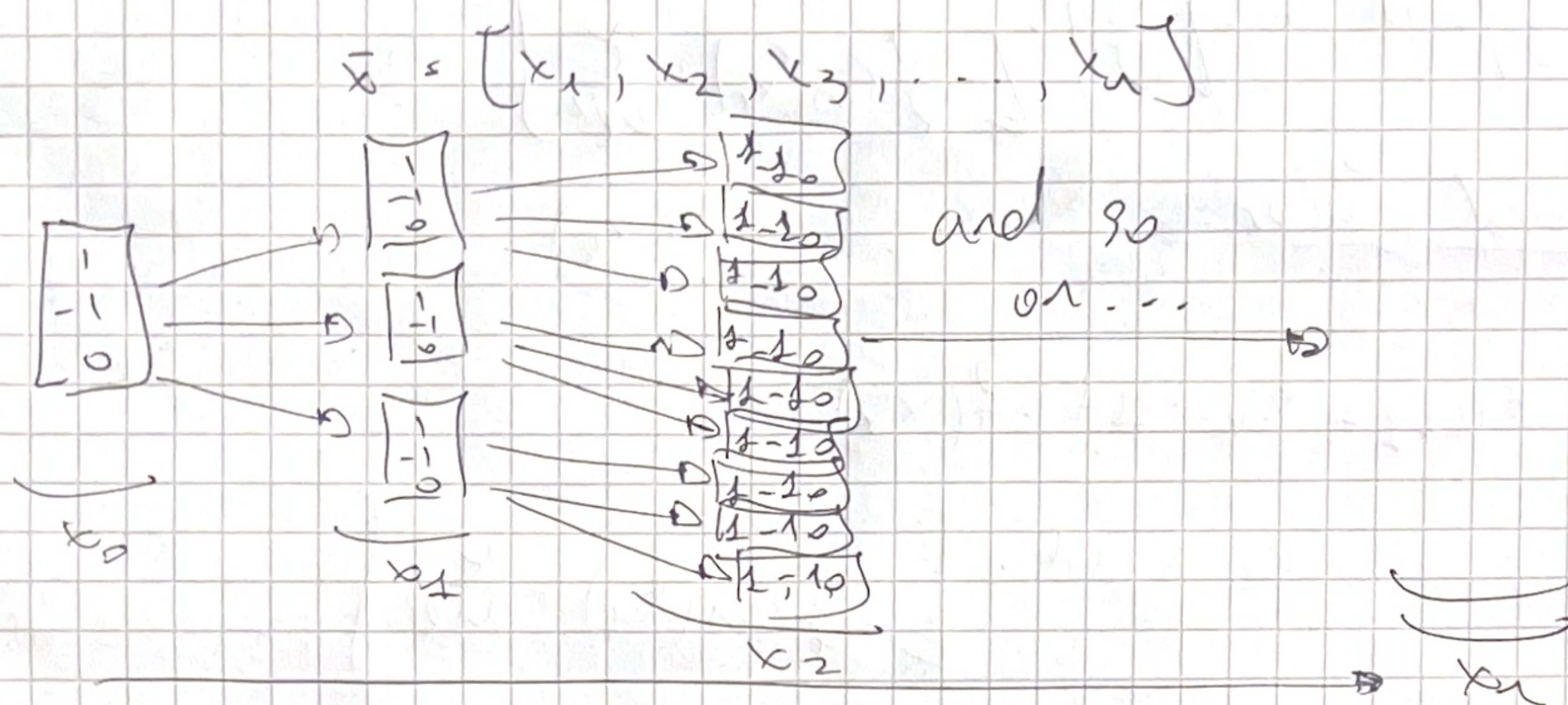


## Numeric GtD:

### Offline:

$x_0$  initial guess calc. all possible grad directions using a combinations tree & recursion.



### Online:

- I) find  $f(x_{curr} + \text{Amp} \cdot \text{Dir}) < f(x_{curr})$   
⊕ test all to go in the biggest change (goal) direction

BestDir = Dir

- II) While I is true Keep going  
if not then find a new best Dir.

the new found one

- ⊕ for convergence if  $\text{Dir} \nparallel \text{BestDir}$  are parallel then  $\text{Amp} = \text{Amp}/2$ .

End criteria: 1) if the change

$$|f(x_0 + \text{Amp} \cdot \text{Dir}) - f(x_0)| < \epsilon \rightarrow \text{User defined}$$

2) or a certain it passed...  
maybe to run live on hardware?

