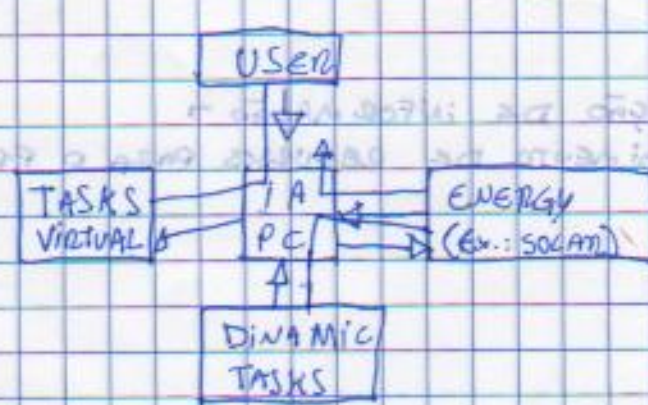


$$[\text{in } \mathbb{R}^n] \quad (x_k \in \mathbb{R}^n)$$

1. Definition of a function
 A function f from a set A to a set B is a rule that assigns to each element x in A exactly one element y in B .
 We write $f: A \rightarrow B$.
 The set A is called the domain of f , and the set B is called the codomain of f .
 The image of x under f is denoted by $f(x)$.
 The range of f is the set of all elements y in B such that $y = f(x)$ for some x in A .

AN ORDERED PAIR OF DIFFERENT ANTS.
[GROWING] ALSO



USED: CONSUMES ENERGY AND INFO, WHILE DEVELOPS IT.
I.A: MANAGES THE INFO, AUTOMATIZING TASKS AND PROCESSING VARIABLES TO MINIMIZE ENERGY COSTS, AND GENERATE BETTER.
DYNAMIC: HUMAN WORLD/REALITY (PHYSICAL AND META) MECHANIC TASKS.
VIRTUAL: MECHANIC TASKS ^{USED TO} ~~AS~~ THAT CAUSE AUTOMATED.
TASKS: DYNAMIC, AND VIRTUAL.