* A partir de nivel 5

• Programación:
  • Problem solving using computers
  • Abstractions or Models.
    • Concentrate on a small number of properties.
  • Ignore all other aspects
• Names
  • Abbreviation for more detailed explanation
  • Used to refer to Variables, Subroutines, Programs and Modules. —→ Estan volviendo!

Data:
  • Physical representation of our abstractions —→ Campo magnético
    • Manipulated by computers ↝ su actualización es una abstracción
    • Derive new data by manipulating the data according to certain rules
  • Transmit information between human beings
  • Store data for future use
  * Information:
    • Meanings we assign to data —→ Interpretación humana.

Data type
  • Primitive data types
    • Integer
    • Real
    • Character
    • Boolean
  • Name (Optional), Range and Set of Operations
  • Range
    • A finite set of values data can assume
  • Operation
    • Rule of data manipulation
    • Maps a finite set of data (inputs) into a finite set of data (output)
    • Takes a finite time
• Data operation
  • Defined by:
    • Enumeration of output values for all possible combinations of input values
      • Often not practical
    • Rule involving a finite sequence of simpler operations
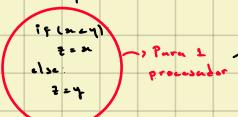
• Computation, Algorithm, and Program
  • Computation:
    • A finite set of operations applied to a finite set of data in an attempt to solve a problem
      • El orden lo da la maquina
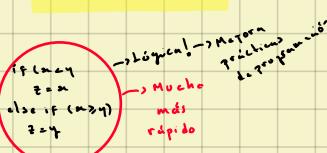   • Ser humano —→ Podemos hacer varias cosas al mismo tiempo
  • Algorithm:
    • A computation that solve the given problem
    • No toda la solución es una ruta critica ↝ No todo debe estar organizado
    • Paradigma de programación secuencial —→ Produce soluciones no eficientes
      ↳ <mark>Totalmente en orden</mark>

    • Casos especiales

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if (x<y)          →Para 1          if (x<y)          →Lógica! →Mejora
  z=x               procesador       z=x                       tiempos
else                               else if (x>y)     →Mucho    de programación
  z=y                                z=y              más
                                                      rápido
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$ax + by = c$
$dx + ey = f$
input a,b,c,d,e,f
$x = f(a,b,c,d,e,f)$
$y = g(x)$ —→ Ineficiente —→ Sirve para 1 procesador
$y = f(a,b,c,d,e,f)$ —→ Mejor para +1 procesador

- Program:
  - Formal description of a computation
- Lenguaje formal
  - Lenguaje artificial → No lo habla el ser humano
  - Lenguaje natural → Va cambiando constantemente, el significado de la palabra cambia
    - ↳ Significado depende del contexto
    - Produce ambigüedad

  - Lenguajes formales: No hay ambigüedad
    - Describe data types and operations as well as combinations of them
    - Programming language used to express the formal description between human beings
      - ↳ Para el computador se le manda una tira de 0 y 1.

- Machine Language used to express the formal description to a computer
  - ↳ El compilador debe dar ese orden
- Programación secuencial:
  - ▸ The operations of a computation must be carried out (executed/interpreted) in certain order of precedence to ensure that the result of an operation can be used by others.
  - ▸ The simplest possible precedence rule is the execution of operations in strict sequential order one at a time
    - Execution totally ordered in time
  - Sequential Computation
    - A finite sequence of operations applied to a finite set of data in an attempt to solve a problem
  - Sequential process:
    - Lo que crea el sistema operativo para ejecutar el proceso
    - Lo que realmente se ejecuta
    - Execution/Interpretation of a Sequential Computation