

Programming

I. Concept of Reducing Complexity

II. Algorithms

a. Rubics Cube

- i. X algorithms to solve
- b. Other Algorithms
 - i. Recipe to Bake a Cake
 - ii. Directions to the Science Center
- c. How detailed to the instructions in an algorithm need to be?
 - i. For a computer, extremely detailed
 - ii. Logic Gates
 - iii. Boolean Logic

III. History of Programming Languages

- a. Ada Lovelace
 - i. Video: Difference Engine
 - ii. First Computer Program
- b. Machine Languages
 - i. Logic Gates
 1. http://en.wikipedia.org/wiki/Logic_gate
 - ii. Punch Cards
 1. Old Computers with Punchcards seem complex, but they were easier than doing all that math by hand
 2. Bit Bucket
 3. First Computer Bug
 - iii. Simpsons/Lisa/Apu Punchcards Scene
- c. Assembly Language
- d. 1GL
- e. 2GL
- f. 3GL
- g. Object-Oriented
- h. Family Tree of Programming Languages

IV. Programming Concepts

- a. Algorithm
 - i. Bubble Sort Exersize
- b. Variables
 - i. VARCHAR/CHAR
 - ii. INTEGER/FLOAT
 - iii. BOOLEAN
 - iv. DATE/TIME
- c. Conditional Logic
 - i. IF/THEN
 - ii. CASE
 - iii. Loops

1. Infinite Loops

d.

V. JavaScript

- a. Tic Tac Toe Example
- b. Super Mario Example

VI. Cut and Paste Programming

VII. Lab: Modify a JS Program

- a. Spider following mouse.
- b. Modify from Spider to something else

VIII. Lab: Put Some Games on Your Webpage

a.

JS Bubblesort

<http://www.nczonline.net/blog/2009/05/26/computer-science-in-javascript-bubble-sort/>

Use a WHILE Loop and a Boolean to stop Loop instead of two loops.

Hand our playing cards in same suit to kids.

One kid is i another is the boolean (use thumbs-up for binary 1 as true) another is the swapCards function.

Alternatives to this method (two loops).

This is actually a very inefficient algorithm.

DHTML Bubblesort

<http://www.the-art-of-web.com/javascript/bubblesort/>

Genetic Algorithms: Survival of the Fittest