Source:

1 | rand ideas in other sciences

1.1 | theory of matter

1.2 | big bang theory

1.3 | newtons laws

1.4 | conservation of matter / energy

1.5 | cell theory

1.6 | evolution

1.7 | math

1.7.1 | finding relationships (abstract things)

2 | what do those grand theories do?

2.1 | describe invariant relationships like $E=mc^2$

2.2 | define limits on what is possible and what isn't

2.3 | emergent properties from computational systems that are difficult to predict

3 | how does computing let us do similar things to laws and theories in science?

4 | computational complexity theory

4.1 | how long it takes to compute the answer as a function of the input size

4.2 | overview of presentation

4.2.1 | methods for determining computational complexity

4.2.2 | wide variation in complexity of diff problems

4.2.3 | computationally hard problems are very difficult

4.2.4 | some problems have not yet been proven

4.2.5 | problems have been grouped into equivalence classes

5 | big O notation

5.1 | approximate run time (not exact)

5.2 | how the time scales/changes

2. structure and interpretation of computer programs source recommended

7 | programs are complex (more words than war and peace)

8 | programming can become faster by developing tools

8.1 | languages, compilers, debuggers, editors, libraries, methodologies, code repos

9 | missing grand idea: evaluating languages scientificly

9.1 | people adopt languages in a bandwagon-ey way

9.2 | people compared lisp and java and found that lisp tended to be faster, faster to write, and shorter

10 | inspire human reasoning skills from computation

10.1 | computational thinking by jeannette wing

11 | the internet - communications network that interconnects almost every computer on earth

11.1 | design goals

11.1.1 | highspeed

11.1.2 | reliable / decentralized

11.1.3 | many types of computers

11.1.4 | many types of networking tech

11.1.5 | no appilation knowledge of network tech

11.1.6 | no appliation knowledge of networking topology

11.1.7 | many applications

11.1.8 | simple application interface

11.1.9 | anonymity

11.1.10 | security

11.2 | design solution

11.2.1 | packet switching over circuit switching (wires don't move)

11.2.2 | some redundancy

11.2.3 | common packet protocol

11.2.4 | routing algorithms

2. application layer, transport, internet, link, actual hardware