Algorithms and Church's Thesis

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Computable Functions

- Importance of having precise definitions of *effectively* computable functions, or algorithms, was understood in the 1930's. There were several attempts to formalize the basic notions of computability:
  - Turing Machines (1936)
  - Post Systems (1936)
  - Recursive Functions (Kleene, 1936)
  - Markov Algorithms (1947)
  - λ-calculus (Church 1936)

- On the surface, these approaches look quite different. It turned out, however, that they are all equivalent! All these, and all later formalizations (combinatory logic, *while* programs, C programs, etc.) give essentially the same meaning to the word *algorithm* .

Church’s Thesis

- The statement that these formalizations correspond to the intuitive concept of computability is known as *Church's Thesis.*
- Church's Thesis is a belief, not a theorem.
- (though we often act as if we believe it is true, even though we don’t know its is true)