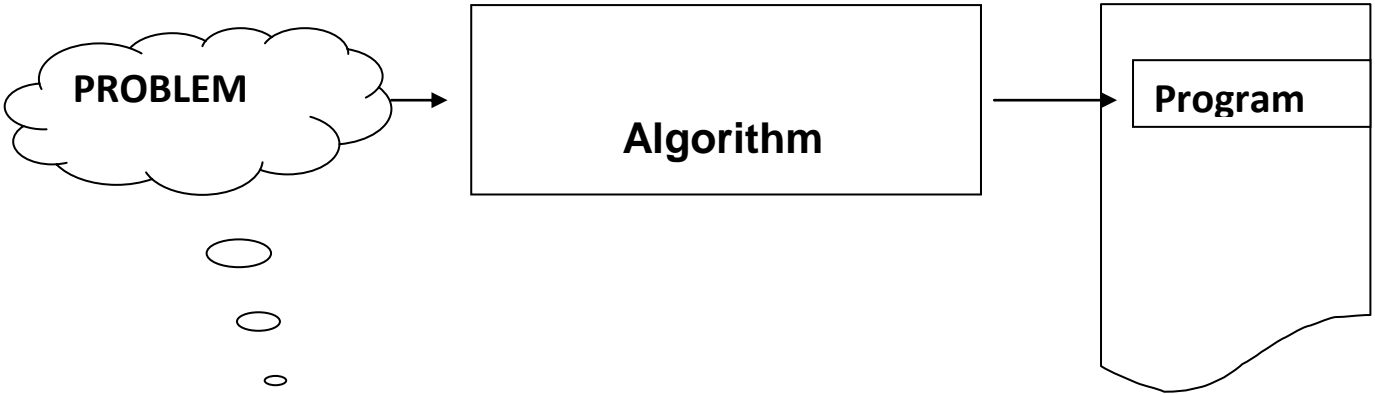


What is Algorithm?

prof.ssa Rachele Di Palo



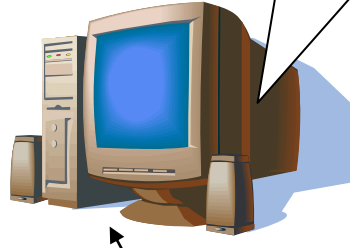
I can think; I can decide;
I can solve problems;
I ask questions ;I am intelligent.

Computers cannot think;
the computer cannot decide;
the computer carries out the orders;
the computer is stupid



ALGORITHM

is a procedure or formula for solving a problem



The man (programmer) write instruction to solve problem.
The programmer write instruction in an algorithm .

The computer is executor of instruction.
The computer is executor of algorithm

What is Algorithm?

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ALGORITHM

is a set
of elementary instructions,
finite in number,
that uniquely interpretable (unambiguous)
for solving a problem

The algorithm is translated in a
"programming language" that allows us to
write a program for a computer

The word derives from the name of the mathematician, Mohammed ibn-Musa al-Khwarizmi, who was part of the royal court in Baghdad and who lived from about 780 to 850. Al-Khwarizmi's work is the likely source for the word *algebra* as well.

When you write a [computer program](#), you have to tell the computer, step by step, exactly what you want it to do. The computer then "executes" the program, following each step mechanically, to accomplish the end goal.

When you are telling the computer *what* to do, you also get to choose *how* it's going to do it. That's where [computer algorithms](#) come in. The algorithm is the basic technique used to get the job done.

An [algorithm](#) is a step by step instruction to execute a program.

What is Algorithm?

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Example

Let's follow an example to help get an understanding of the algorithm concept.

• The taxi algorithm:

1. Go to the taxi stand.
2. Get in a taxi.
3. Give the driver my address.

• The call-me algorithm

1. When your train arrives,
2. call my cell phone.
3. Meet me outside baggage claim.

• The bus algorithm

1. Outside baggage claim, catch bus number 70.
2. Transfer to bus 14 on Main Street.
3. Get off on Elm street.
4. Walk two blocks north to my house.

• The rent-a-car algorithm

1. Take the shuttle to the rental car place.
2. Rent a car.
3. Follow the directions to get to my house.

What is Algorithm?

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Algorithm of recipe for a cake

- 1) weighs 400 grams of almonds;
- 2) weighs 300 grams of dark chocolate;
- 3) weighs 250 grams sugar
- 4) dissolve 250 grams of butter in a double boiler;
- 5) take six eggs;
- 6) chopped almonds;
- 7) chopped chocolate;
- 8) Beat eggs;
- 9) continue to beat
 - 9.1) add sugar;
 - 9.2) Add almonds;
 - 9.3) Add chocolate;
 - 9.4) Add butter;
- 10) Take a pan of 30 cm in diameter;
- 11) Butter the baking dish;
- 12) flour the pan;
- 13) pour the cake into the pan;
- 14) turn oven to 180 degrees;
- 15) enter the cake into the oven;
- 16) close the oven;
- 17) bake for 45 minutes.

What is Algorithm?

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What have we learned?

Set of instructions for solving a problem

The programmer finds the **resolution** of a problem and write the "resolutive algorithm", instruction by instruction.

The computer follows the instructions of the algorithm, step by step, and finds the **solution** to the problem.

The algorithm is translated into **programming language** and on and then plugged into the computer.

elementary instructions

The instructions of an algorithm must be "elementary" (primary), which means that they **cannot be broken down into simpler instructions.**

Example: Get in a taxi and give the driver my address.; (it is not elementary)
weighs 400 grams of almonds and chopped almonds;(it is not elementary)

finite in number Instructions can be very numerous but will always be finite in number.

The algorithms are not infinite. **An algorithm always has a beginning and an end.**

that uniquely interpretable (unambiguous)

A statement cannot be interpreted in several ways, **can be interpreted in one way.**

Example: Add sugar to taste (not uniquely interpretable)

Eighth lesson (11/04/2011)

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What is Algorithm?

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Homework

Write an algorithm