Notes → Class #0

* Why should I learn Computer Programming?

  A. Because it is FUN!

  B. Because somebody (very intelligent) once said "Program, or be Programmed."

     → which means that in the future, if you can't program, you will have to work like a machine...

  C. Because it is so much FUN!

* But hey! It doesn't look like fun. I have to learn so much ....

  * Remember playing football - if you don't know what to do with the ball, or how to do it, you can't really have fun!
  * Same with playing Guitar.
  * Same with video games.

First you pay the price of the ticket (by learning) and then you watch the shows (enjoy ...)

* Okay! So what is a program?

Let's hear a story. There was this man who had a factory where he made CAKES. Everyday, he would gather the materials (flour, sugar, water etc.), put them together in a large bowl, bake the mixture in an oven, cut the cake into pieces, pack them into boxes and finally put them on a truck! Whew! It must be so tiring.

Then one day, he had an idea. He bought a robot. The robot-seller had said, this Robot Mr. X can do anything. So the cake guy was very happy...

He took the robot to his factory and set Mr. X to work. But Mr. X did nothing. He just stood there.

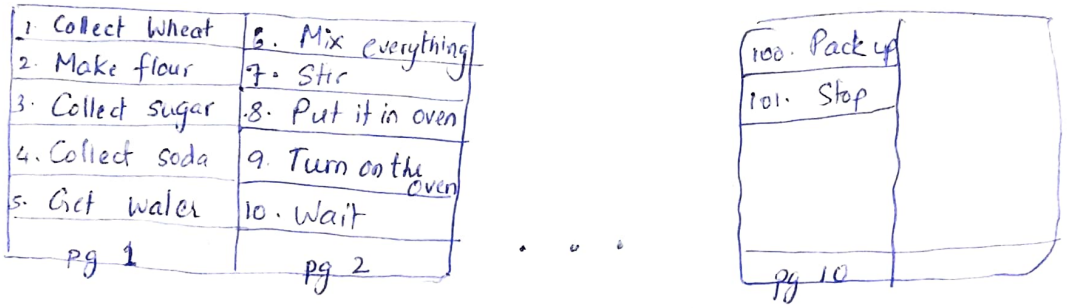
So the cake guy realized - "Oh! I must tell him what to do.". So he did. "Mr. X, gather the materials." So he did. "Mr. X mix them in that bowl" So Mr. X did it. And so on... until all the cakes were ready in the truck. Mr X. was really fast. But, he had to be told everything.

So the next day, he had to do it again - tell Mr. X every step of the work. The cake guy thought - it is so tiring - I have to tell the robot every step.

Then one day, he had another idea. He bought a notebook. He wrote down all the steps to make the

Cake in the notebook. Then he said. "Mr X. Look! This notebook has all the instructions you need to make the cake. Just start at Page No. 1, Line No. 1, and keep doing what it says on each line."

So the notebook looked something like this :



Now Mr. X had everything he needed to work. So he just did that. And the cake guy — he just had food, listened to music, had fun all day. And Mr. X made all the cake, and everything else.

——— THE END ———

* But what does this story have to do anything with a computer? Everything...

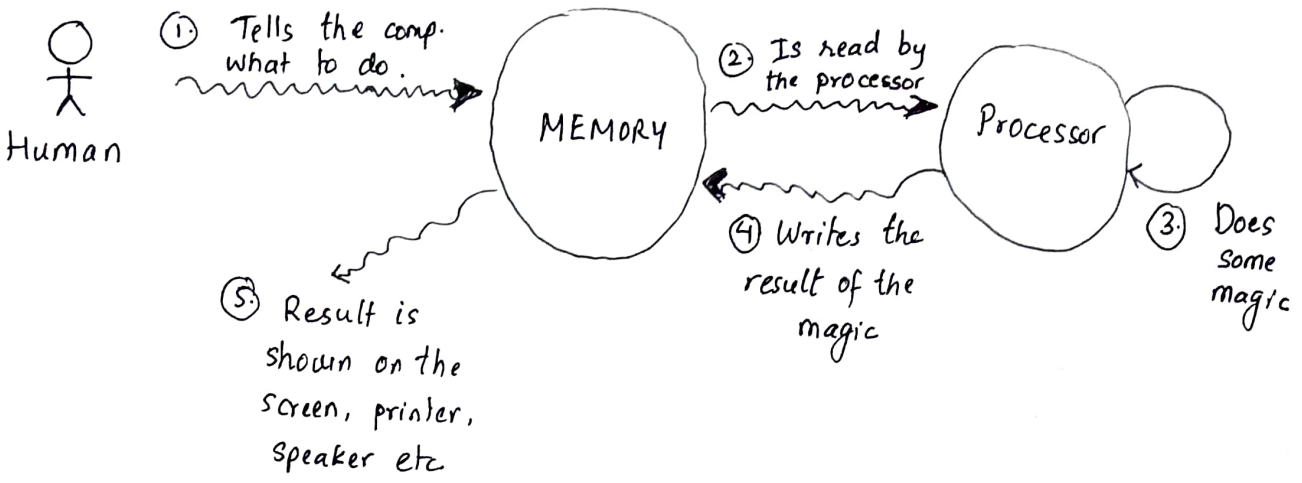
Mr. X is the PROCESSOR

The Notebok is the MEMORY

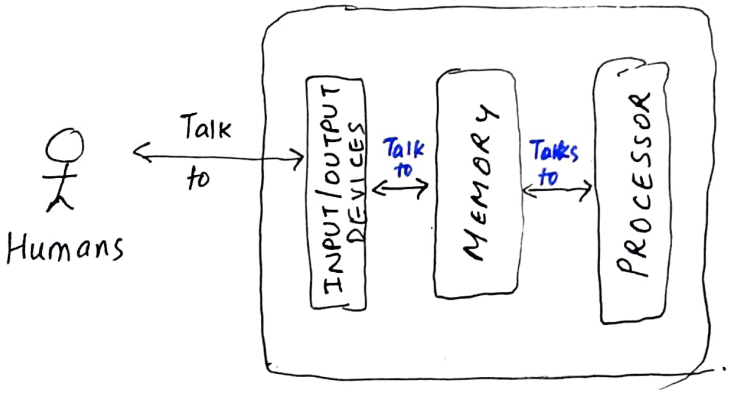
The lines written in the notebook is the PROGRAM.

And the cake guy → That's just you. - the lazy computer user.

* So : Every program works like this →



* So that means, a computer is in-fact, something like this →

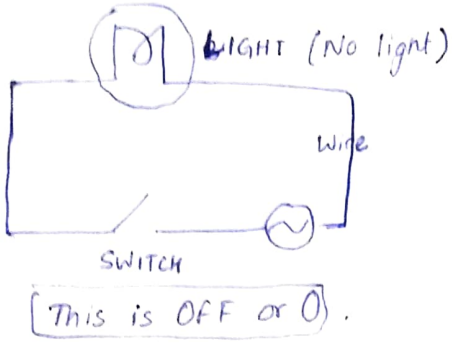


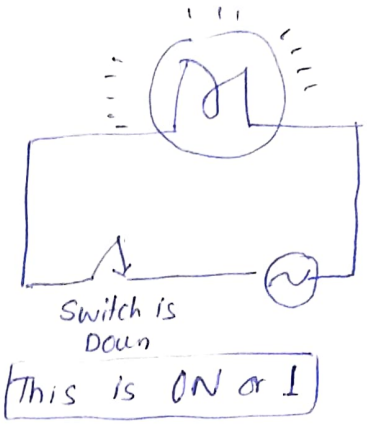
↳ But hey! That is not what my laptop look like.

- See, that's the thing! It does not have to.
- It may look like a phone, a washing machine, an oven, or a toy. It just needs to have -
  1. Some way to talk to it. (keyboard, screen, buttons etc.)
  2. Some memory (to remember what you tell it to do)
  3. A processor (to do what you ask it to do).

* But how does a computer understand what I tell it to do?

Actually, it doesn't. It only understands ON and OFF like a switch.





So a computer only actually understands 1s and 0s. This is called a binary language.

For example 010001 in Computer lang. may mean TURN ON.
or 010010 may mean SHUT UP!

But we can't really tell the computer what to do in 1s and 0s. It would be very hard.

So... some smart people, who knew how to write programs in binary language (1s and 0s) created programs called

TRANSLATORS.

* What is a translator?

So suppose Mr. Modi goes to JAPAN, to meet Mr. Shinzo Abe. But he does not know JAPANESE. So he takes Mr. Translator with him who knows both Hindi & Japanese.

This kind of line-by-line translator is called an

INTERPRETER

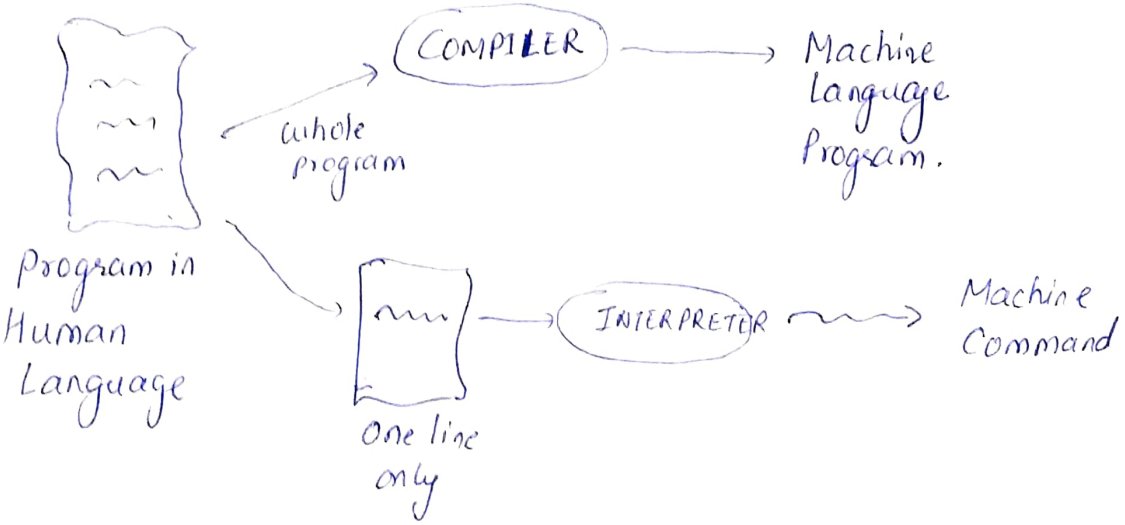
Inter preh terr

There is another kind of translator. This guy translates books from German to English, from Arabic to Hindi, and so on. But, he needs the entire book before he can write even a single line of the translated text. He is called

COMPILER

Cum - pyler

So this is what it looks like



SUMMARY

* Programming is FUN. But needs to be learnt.
* Programs are a SEQUENCE of instructions for the computer to follow.
* Every computer has
    1. A way to talk with it (I/O devices)
    2. Memory (to store programs)
    3. A processor (to do the work told by a program).
* Computers only understand binary (1s and 0s)
* Humans can't write binary easily. So we have.
    a.) Compilers → that take whole programs in human language and convert them to machine* language programs.
    b.) Interpreters → that take line-by-line human commands, convert them to machine language and run them.

    (machine* is the same as Computer)