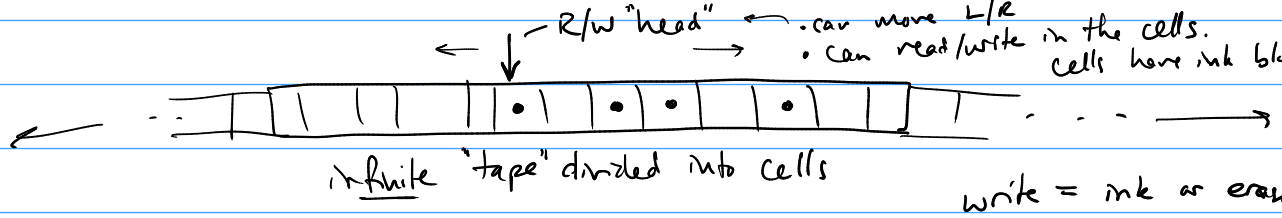
Turing machine

Alan Turing – 1936 PhD thesis.

Simple ideal machine that can do any computation.



"Program" = table: for each state, look @ current cell + decide to move L/R, write/erase, next state based on cell contents.

We will imagine building a computer similar to a Turing Machine.

- Memory (stores bits)
- Current memory location (R/W head)
- 6 instructions:

		2	1	0
ML	Move left	1	0	0
MR	Move right	1	0	1
ER	Erase	0	0	0
WR	Write	0	0	1
JC	Jump if clear	0	1	0
JS	Jump if set	0	1	1

we will allow programs of 32 instructions.
ie. the PC will store 5 bits.

A instruction: 0 + 5 bit address

C instruction: 111 + 3 bit instruction code

We will have 3 registers:

- PC (5 bits)
- A (5 bits)
- I-head (n bits)

(+ RAM of size 2^n)

Key questions / ideas:

- With each instruction, what changes?
- Wire up all possible changes at once
- Control which changes actually happen using load bits.