

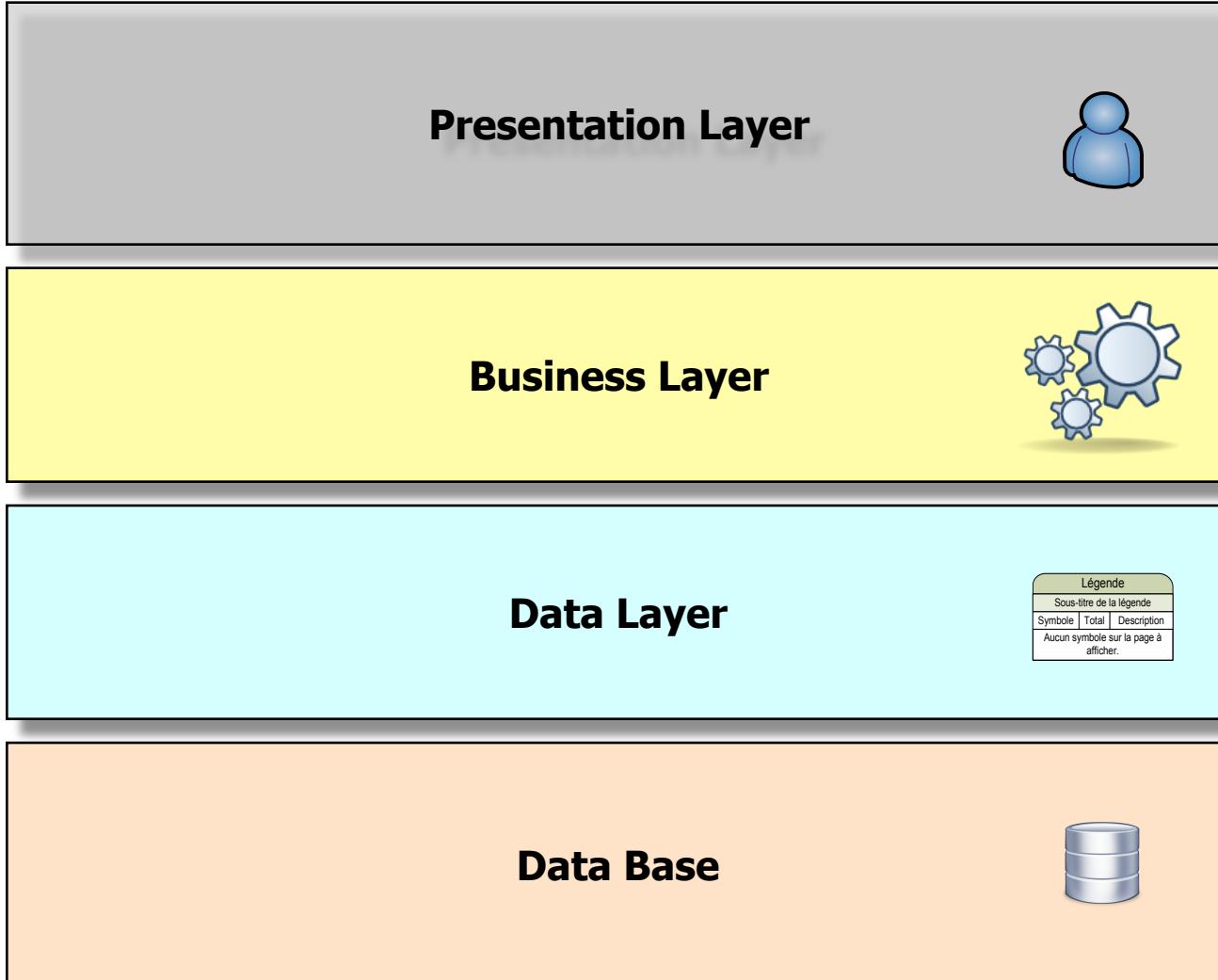
Conception Avancée de Base de Donnée

Tape Storage



Traduction en cours

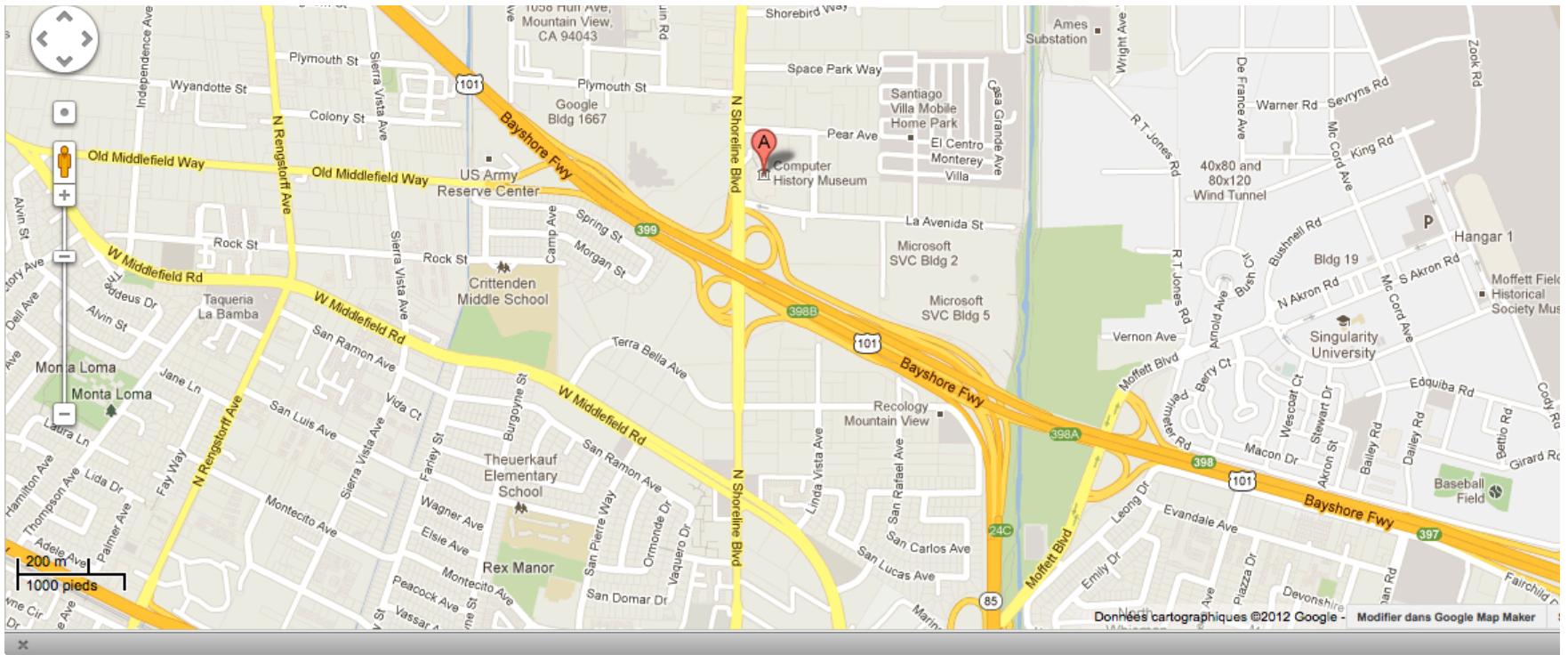
Context



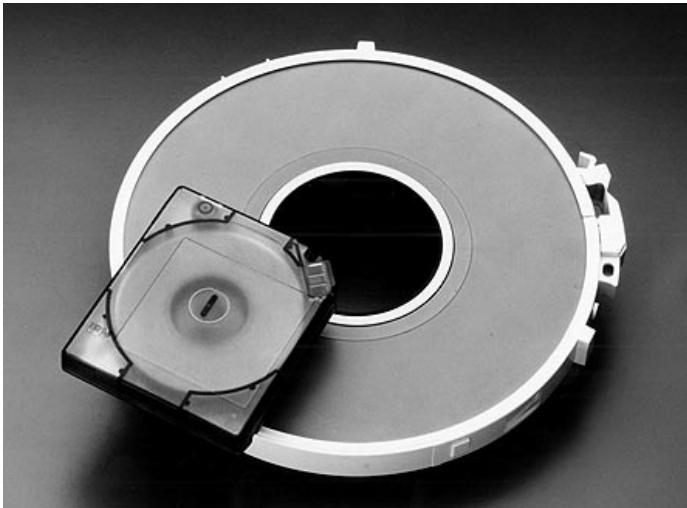


Computer History Museum

- 1401 North Shoreline Boulevard Mountain View, CA 94043, United States



History : Magnetic tape data storage

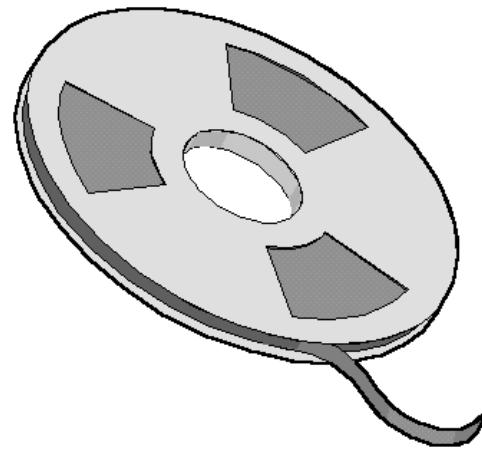
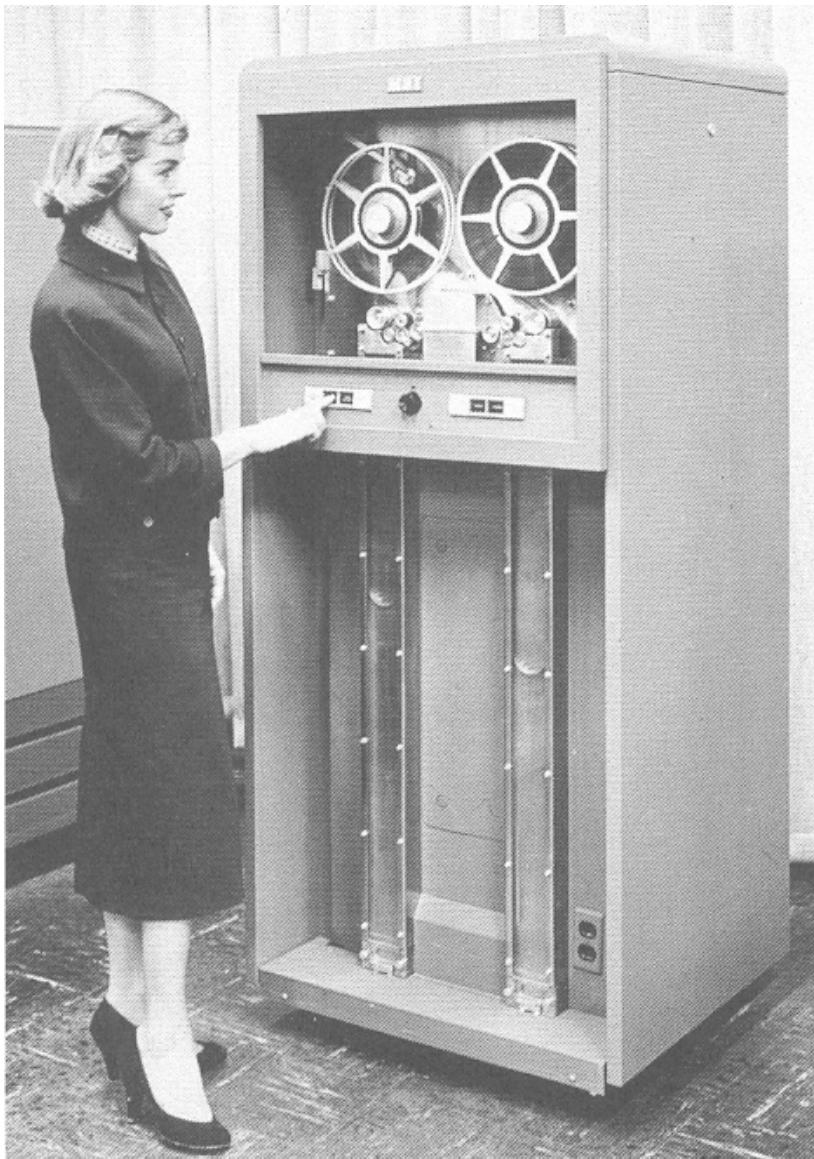


<http://www.computerhistory.org/revolution/memory-storage/8/257/1019>

<http://www.myplanetguides.com/technology/ibm-magnetic-tape-news-49/>

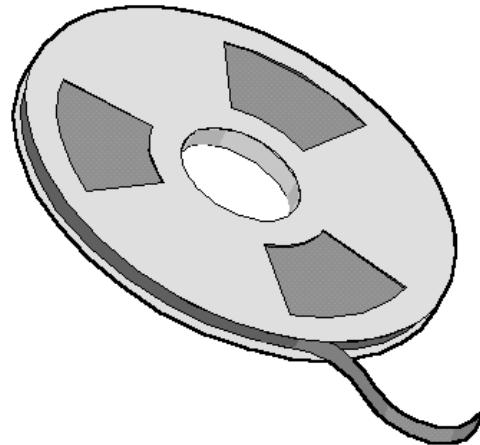
History

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Reel (bobine)

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<http://images.yourdictionary.com/open-reel>

Photoshop PSD file download - Resolution 1280x1024 px - www.psdgraphics.com

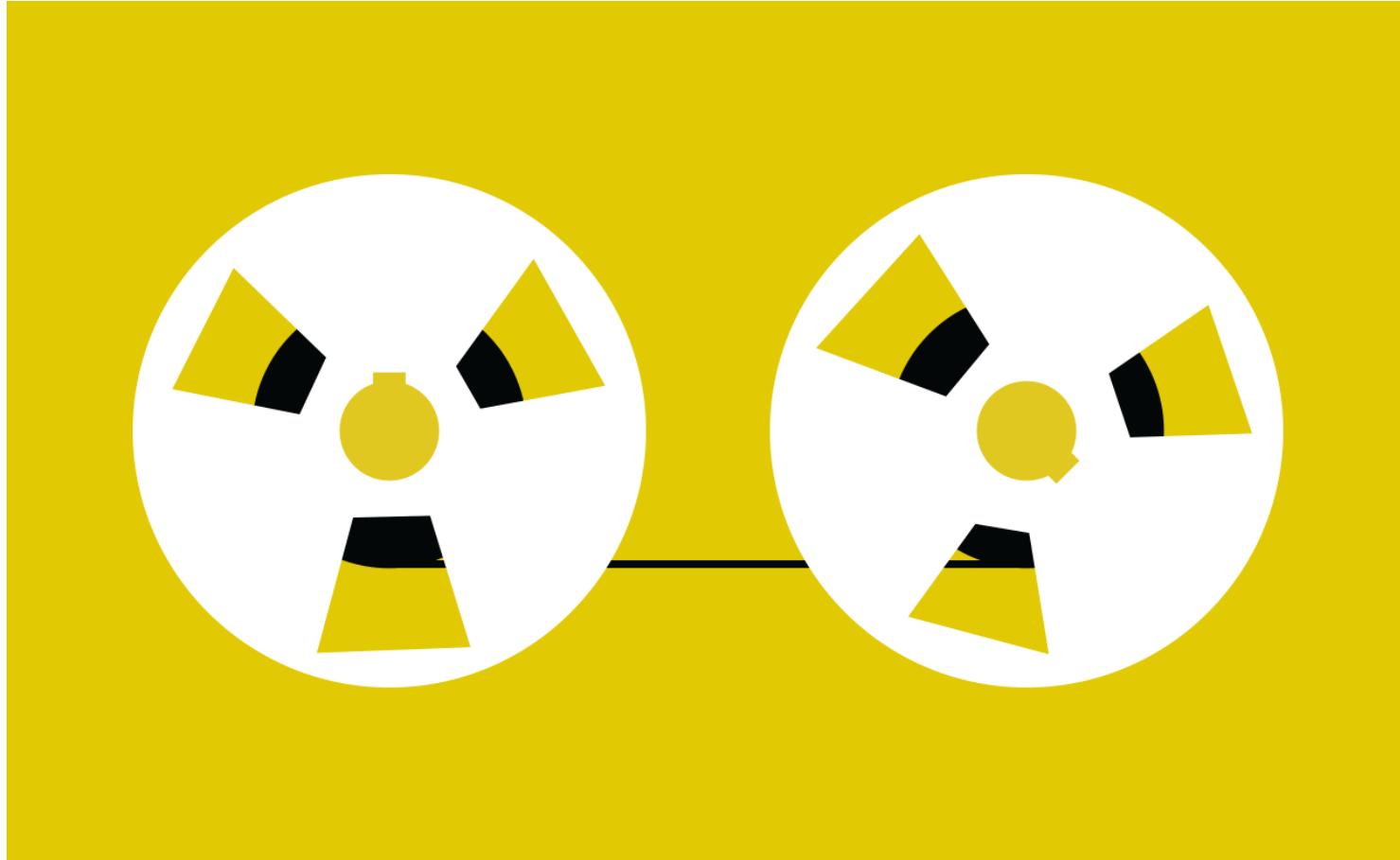


http://upload.wikimedia.org/wikipedia/commons/3/3f/Film_reel.svg



Traduction en cours

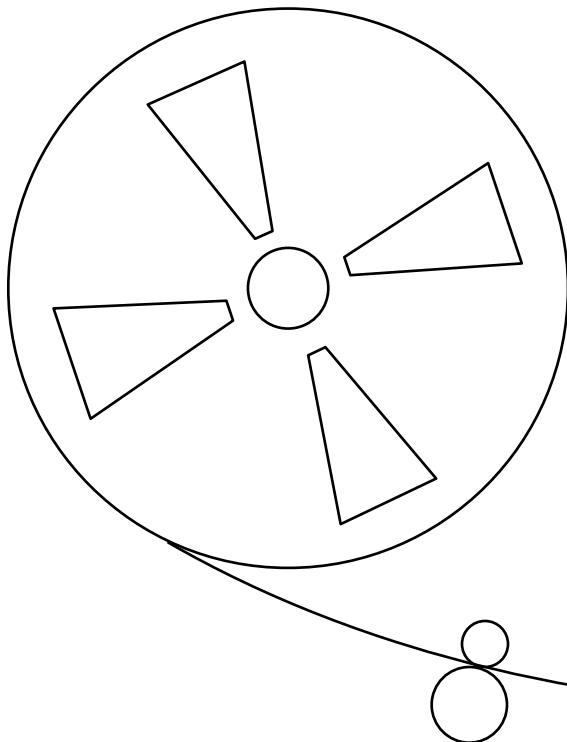
Tape Driver



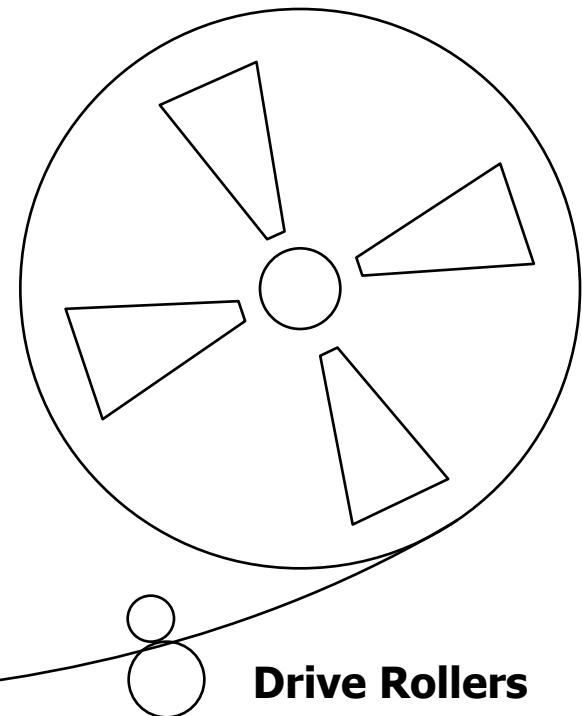
Tape Driver



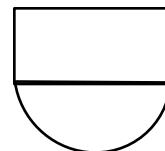
Take Up Reel



Supply Reel

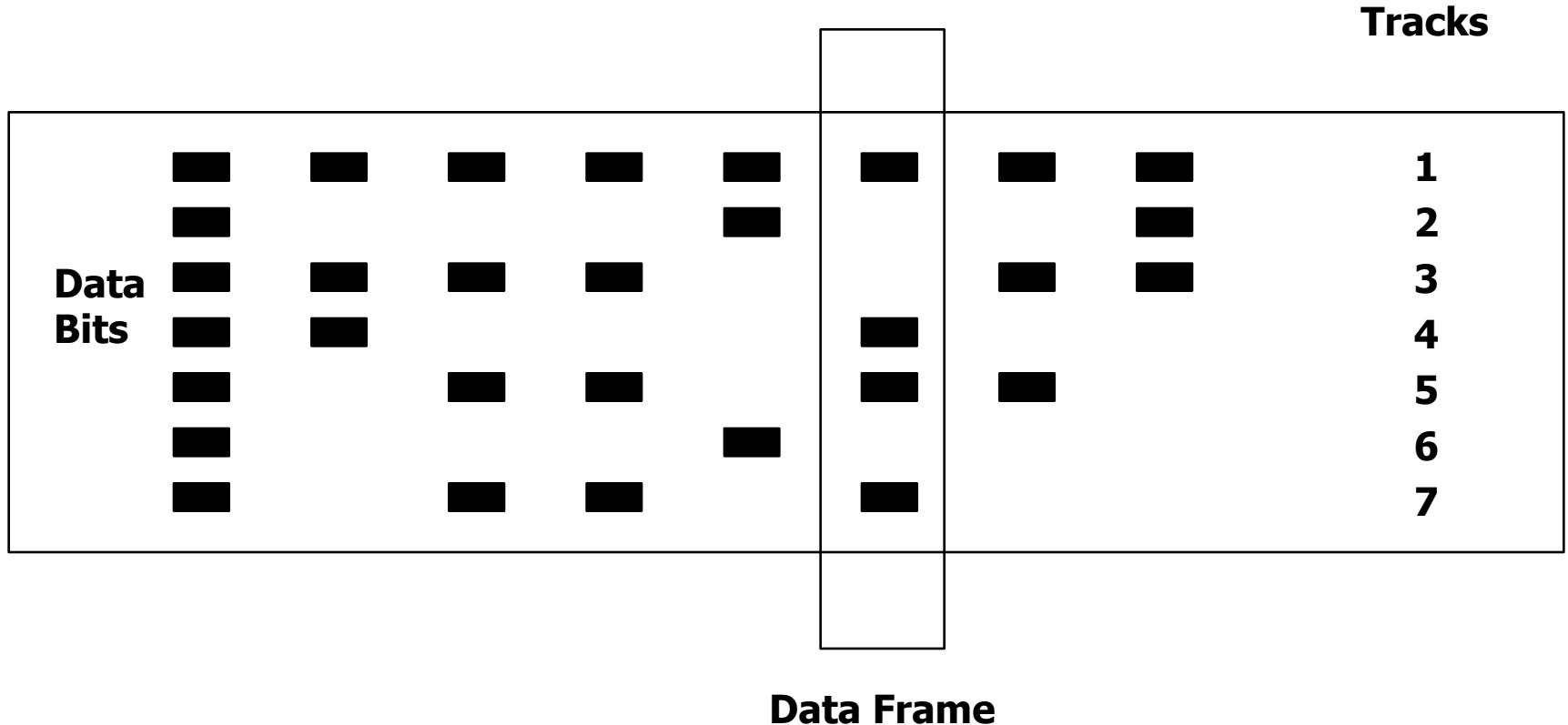


Read/write Head

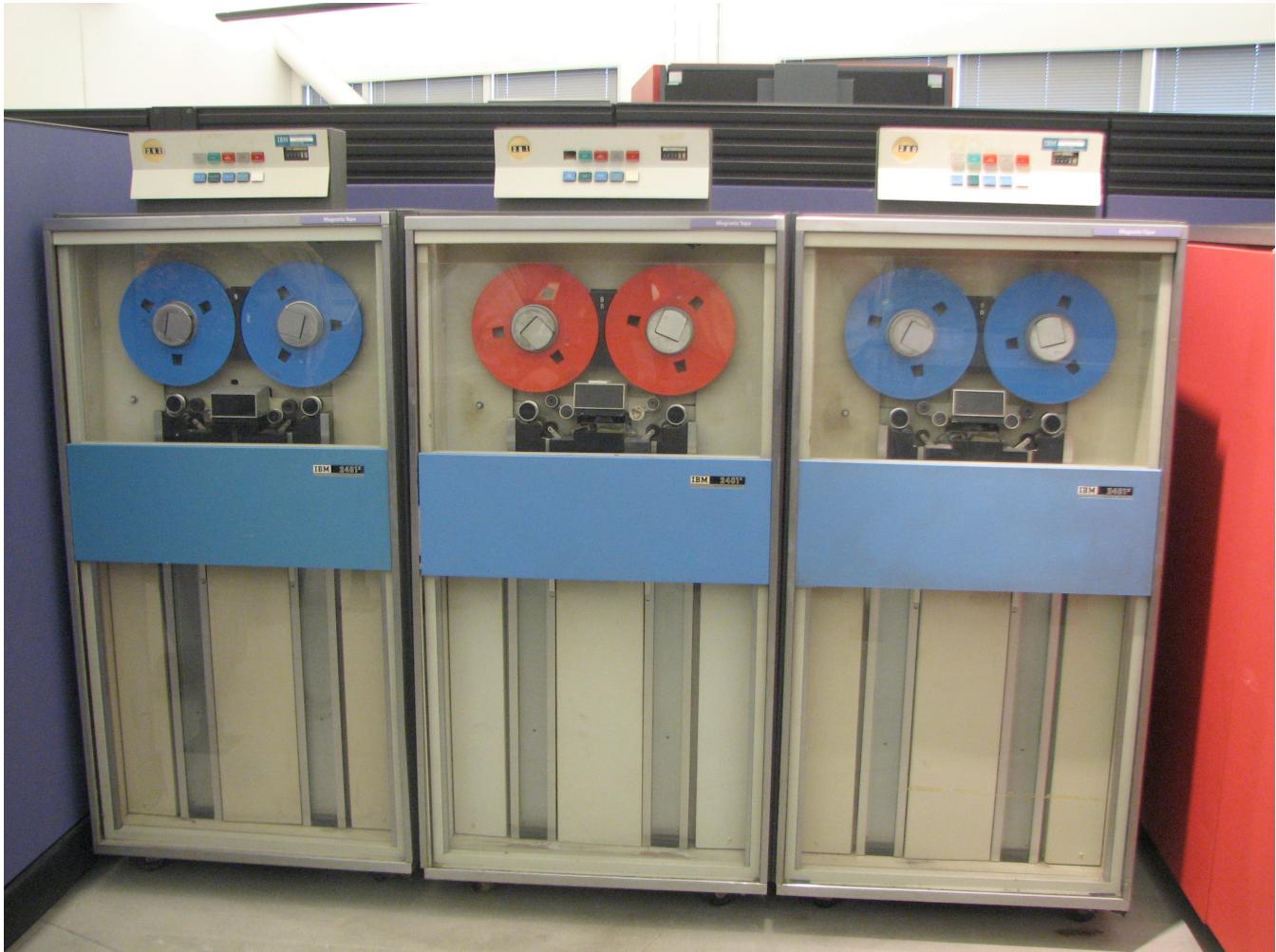


Drive Rollers

Data on tape



History



http://en.wikipedia.org/wiki/IBM_System/360



History



4 Tracks TEAC audio tape recorder





History : Magnetic tape data storage

- IBM the 3090.
- 1951 : Univac-1.
 - 8-track magnetic tape data :
 - density of 128 characters (or bytes) per inch.
 - 1200 foot (365 meters) reel :
 - 1,843,200 bytes.
- Today: magnetic tape data cartridges
 - trillion bytes

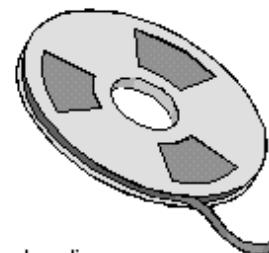
Legacy open reel tapes



- Legacy open reel tapes used nine linear tracks (8 bits plus parity), while modern cartridges use 128 or more tracks.

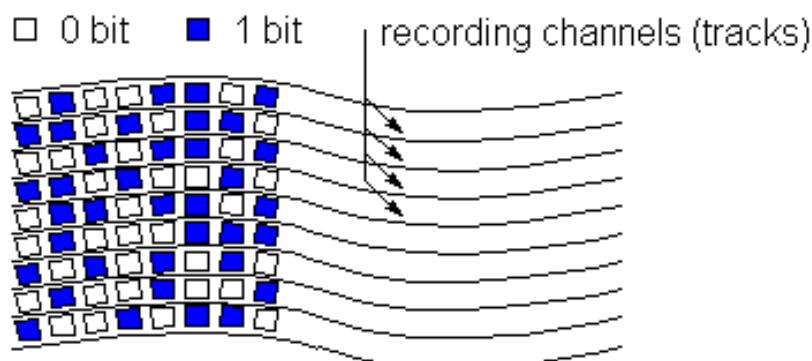
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Open Reel Tape



The venerable half-inch open reel has been used for half a century. The drives and tapes are still being made for legacy applications.

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http://www.pcmag.com/encyclopedia_term/0,1237,t=magnetic+tape&i=46499,00.asp



Brand new 9-track tapes

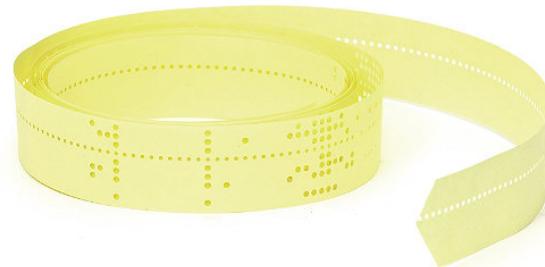
- 9-track tapes could be recorded in different densities:
 - 800 bpi (bits per inch),
 - 1600 bpi, 6250 bpi;
 - At 1600 bpi, a 2400-foot 9-track tape could hold about 50MB (depending on blocking, etc).
 - In earlier times there were 4-track and 7-track drives at lower densities such as 200 and 556 bpi.

1 bit per inch = 4.92125984 bytes / m

Before magnetic tape : Punched Cards



paper tape



Punched paper tape

<http://www.computerhistory.org/revolution/memory-storage/8/257/2233>

Before magnetic tape : Punched Tape



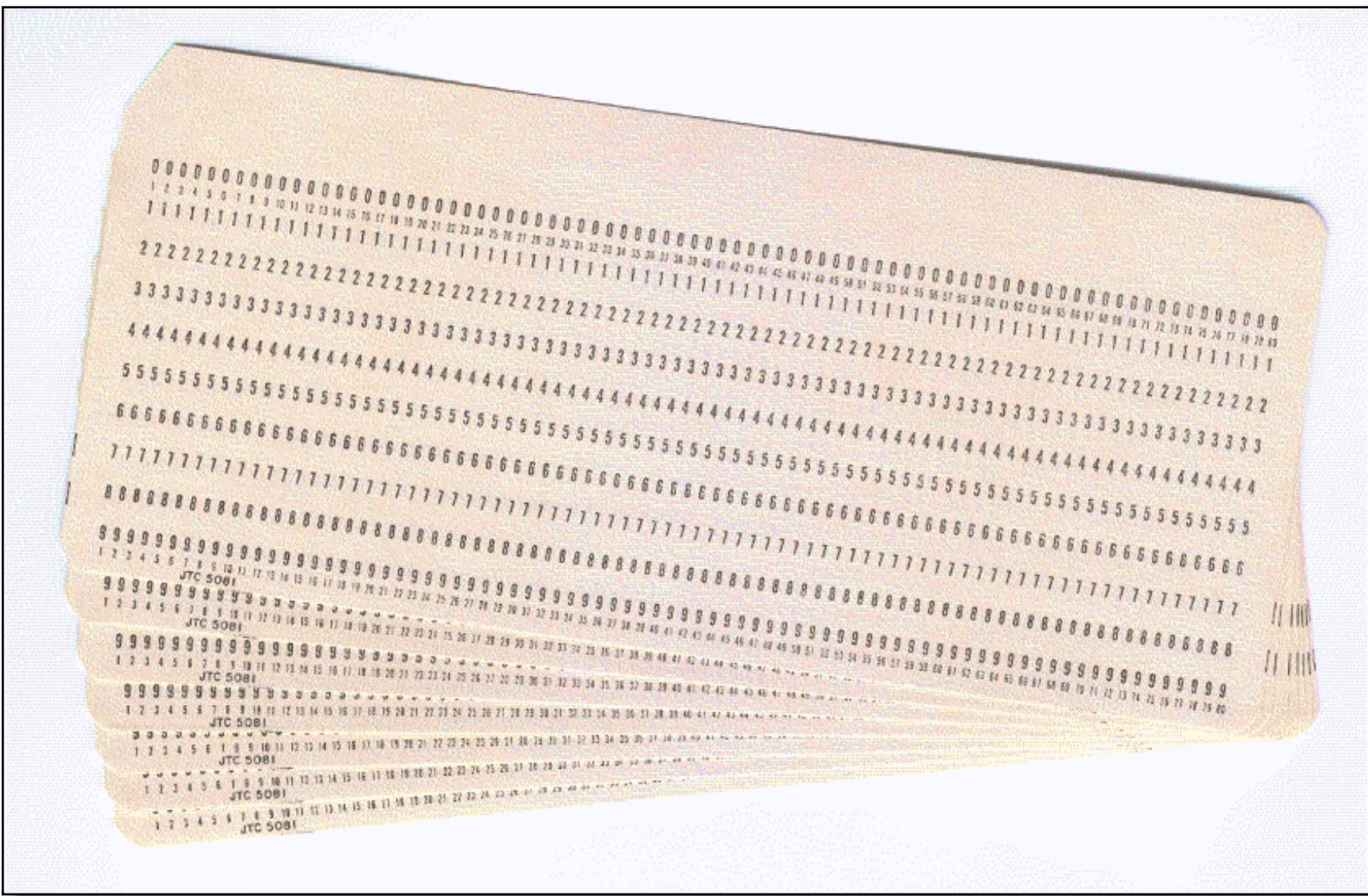
<http://www.dailymail.co.uk/sciencetech/article-2220065/Flossie-worlds-oldest-starred-alongside-James-Bond-Dr-Who-brought-life-shed-Kent.html>

Punched Cards



Above: Card from a Fortran program: $Z(1) = Y + W(1)$

Punched Cards



<http://www.columbia.edu/cu/computinghistory/cards-blank.html>

Tape Drawback

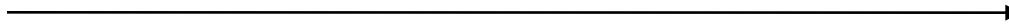


- The major drawback of tape is its sequential format.
- Locating a specific record requires reading every record in front of it or searching for markers that identify predefined partitions.
- Although most tapes are used for archiving rather than routine updating, some drives allow rewriting in place ***if the byte count*** does not change.
- Otherwise, updating requires copying files from the original tape to a blank tape (scratch tape) and adding the new data in between.

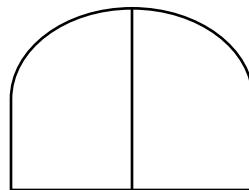
<http://www.pcmag.com/encyclopedia/>



Tape Sequential Access



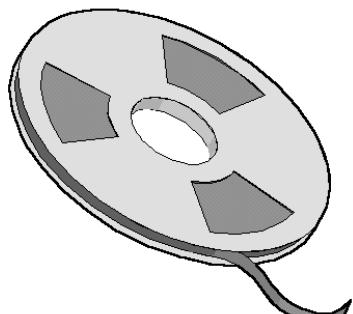
Tape



Magnetic Head



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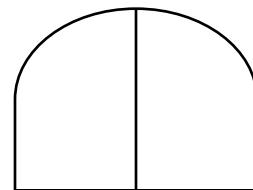


Magnetic Tape

Tape Sequential Recording



Tape

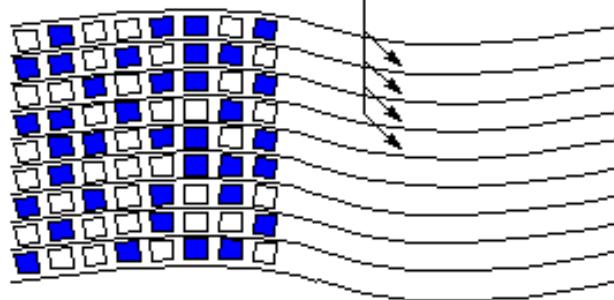


Bytes



Magnetic Head

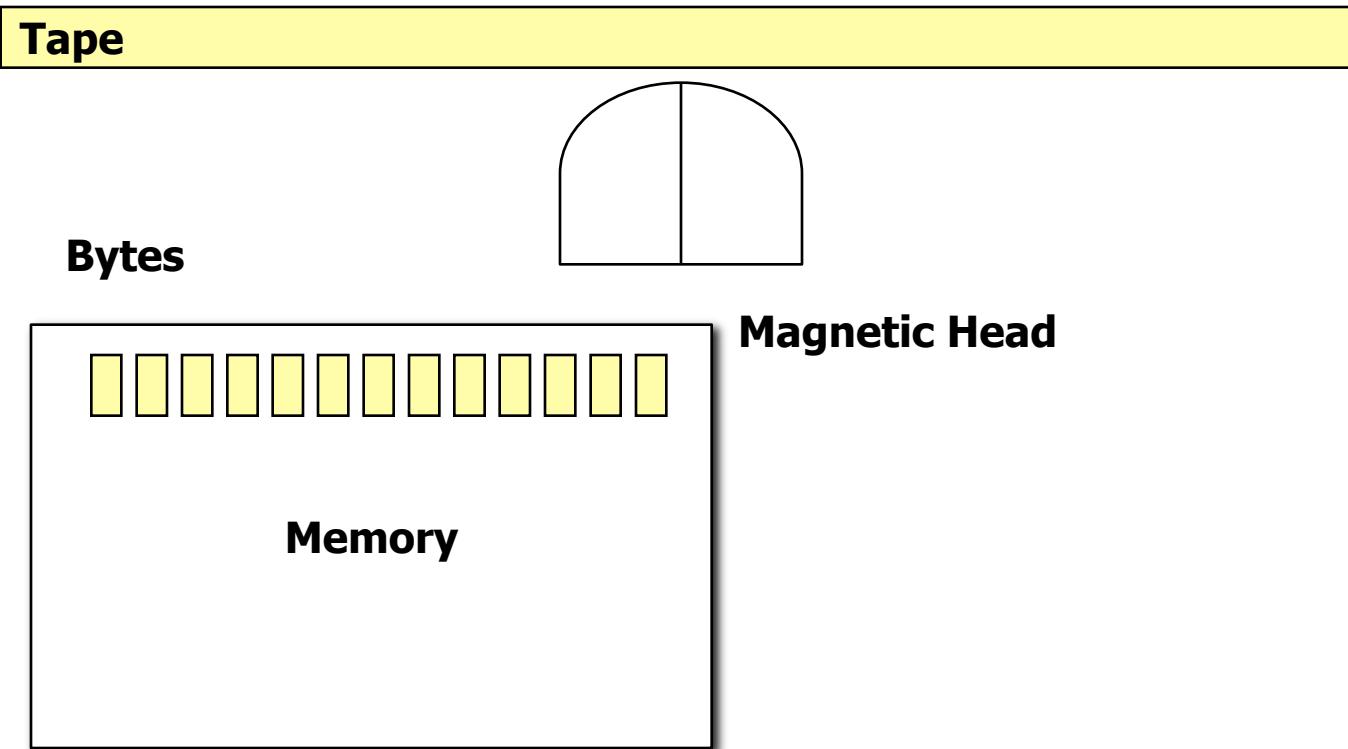
0 bit 1 bit recording channels (tracks)



Magnetic Tape



Tape Sequential Recording

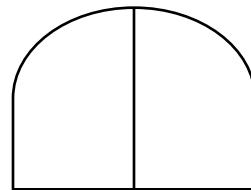


Magnetic Tape

Tape Sequential Recording

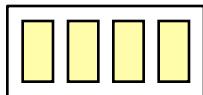


Tape

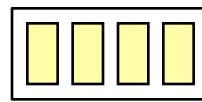
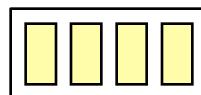
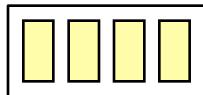


Magnetic Head

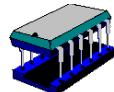
Bytes



Blocks



Memory

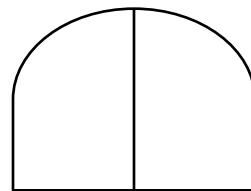


Magnetic Tape

Tape Sequential Recording

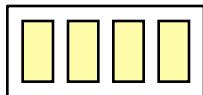


Tape

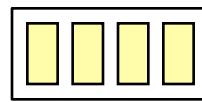
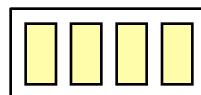
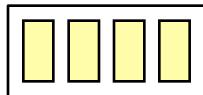


Magnetic Head

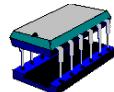
Bytes



Blocks

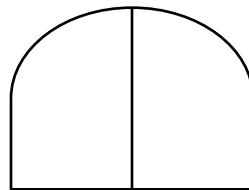
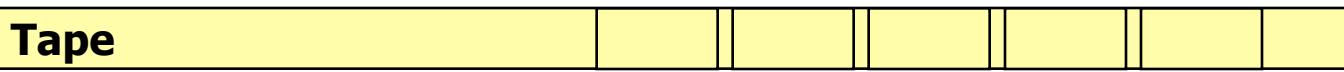


Memory



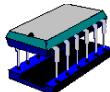
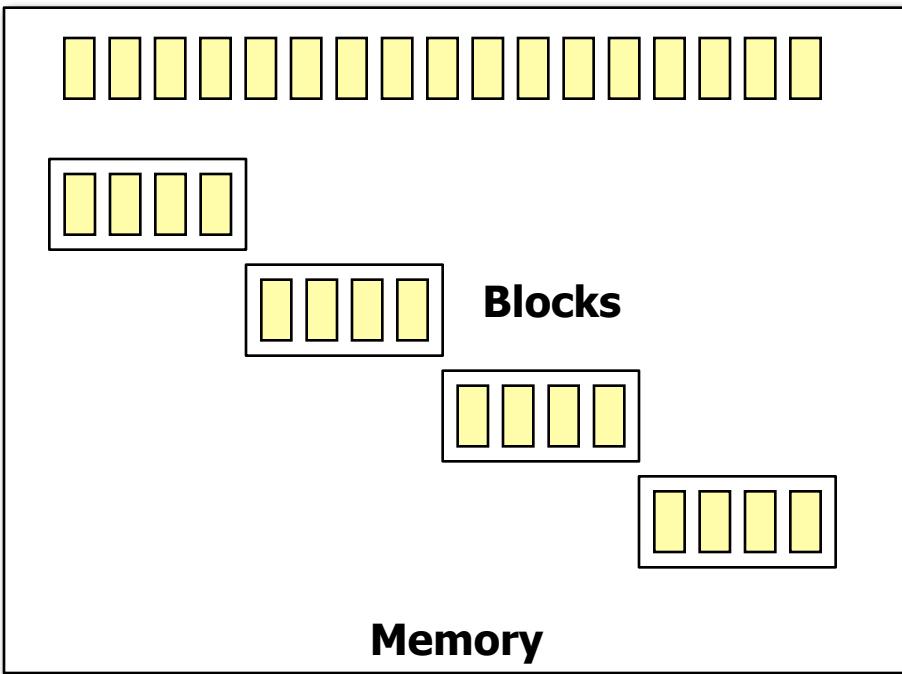
Magnetic Tape

Tape Sequential Recording



Magnetic Head

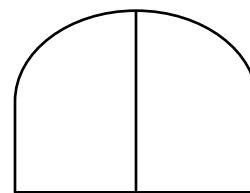
Bytes



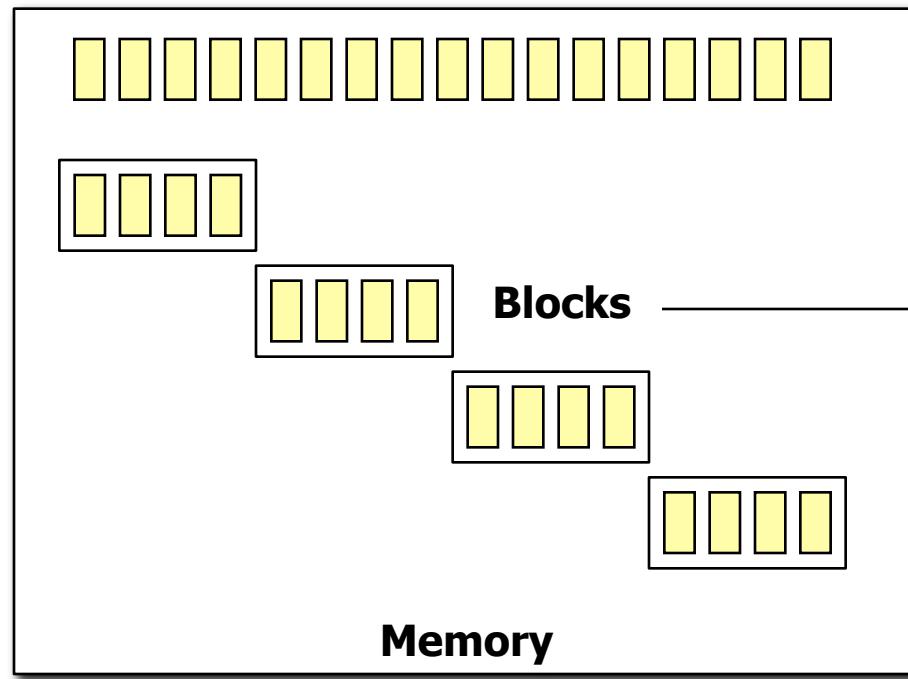
Tape Sequential Recording



Bytes



Magnetic Head

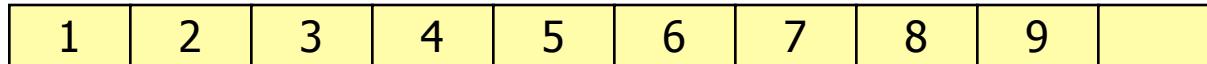




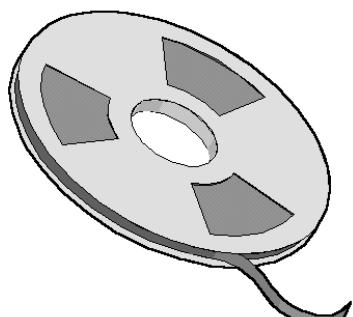
Tape Sequential organization

- Each record is identified by its ordinal position.
 - record 1,
 - record 2
 -
 -
 - Record n.

Tape Sequential Recording

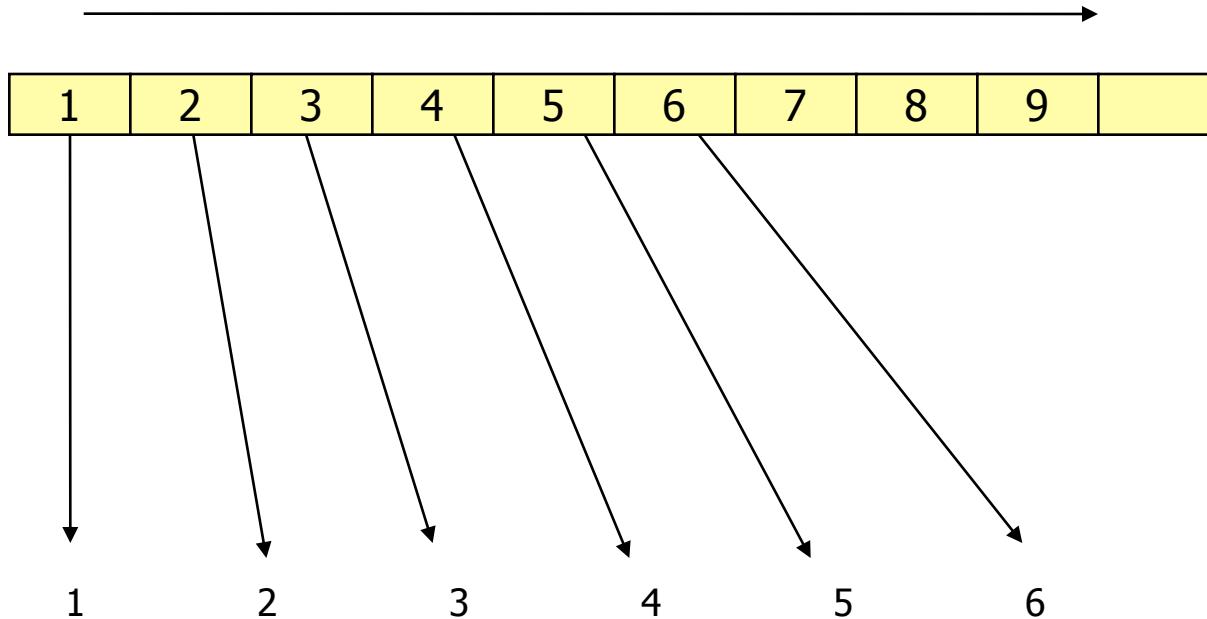


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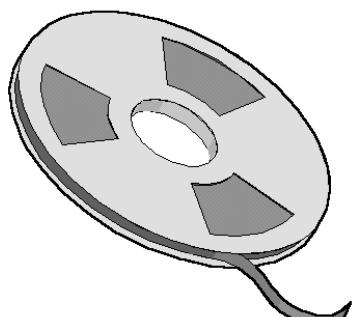


Magnetic Tape

Tape Sequential Access



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Magnetic Tape



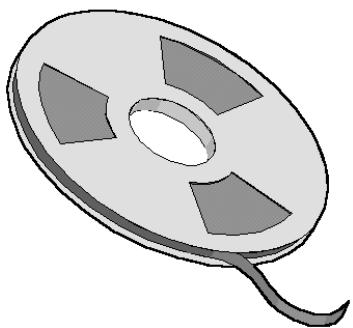
Tape Sequential insert

Record #

1

--	--

Tape



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Key



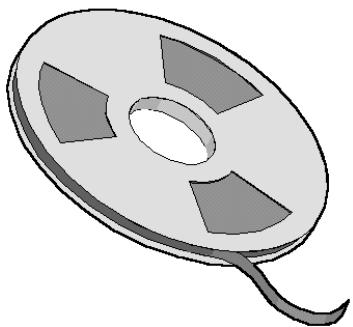
Tape Sequential insert

Record #

Tape



1	Bob	1899
2	Mike	1212311



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Key

Tape Sequential insert

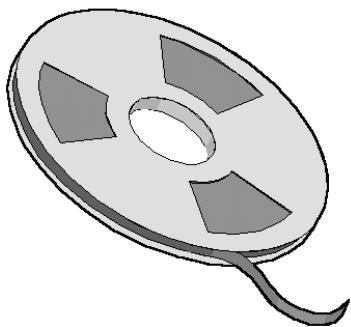


Record # **Tape**

1	Bob	1899
2	Mike	1212311
3	Jim	1312311
4	Alex	31231231
5	Curt	312311



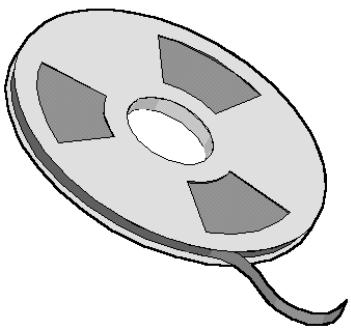
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Key



Tape Sequential insert



Record #

Tape

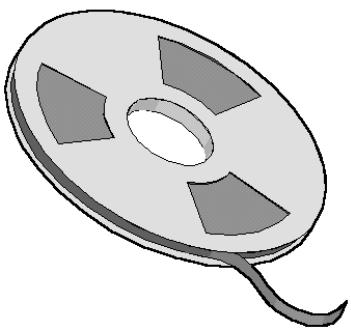
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2	Mike	1212311
3	Jim	1312311
4	Alex	31231231
5	Curt	312311
6	Ronny	45564564
7	Bill	4556231
8	Ben	56454
9	Barak	89789471
10	Kit	2311889



Key



Tape Sequential insert



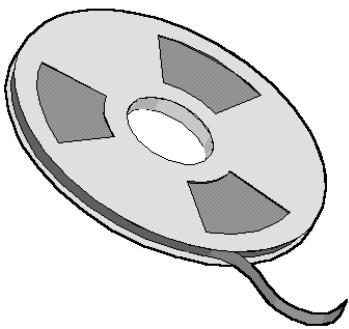
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Record # Tape

Record #	Tape
1	Bob 1899
2	Mike 1212311
3	Jim 1312311
4	Alex 31231231
5	Curt 312311
6	Ronny 45564564
7	Bill 4556231
8	Ben 56454
9	Barak 89789471
10	Kit 2311889
11	Nike 48975
12	Jess 3216544
13	Rick 321648947
14	Aims 1218989
15	Betide 7489

Key

Sequential Tape : insert



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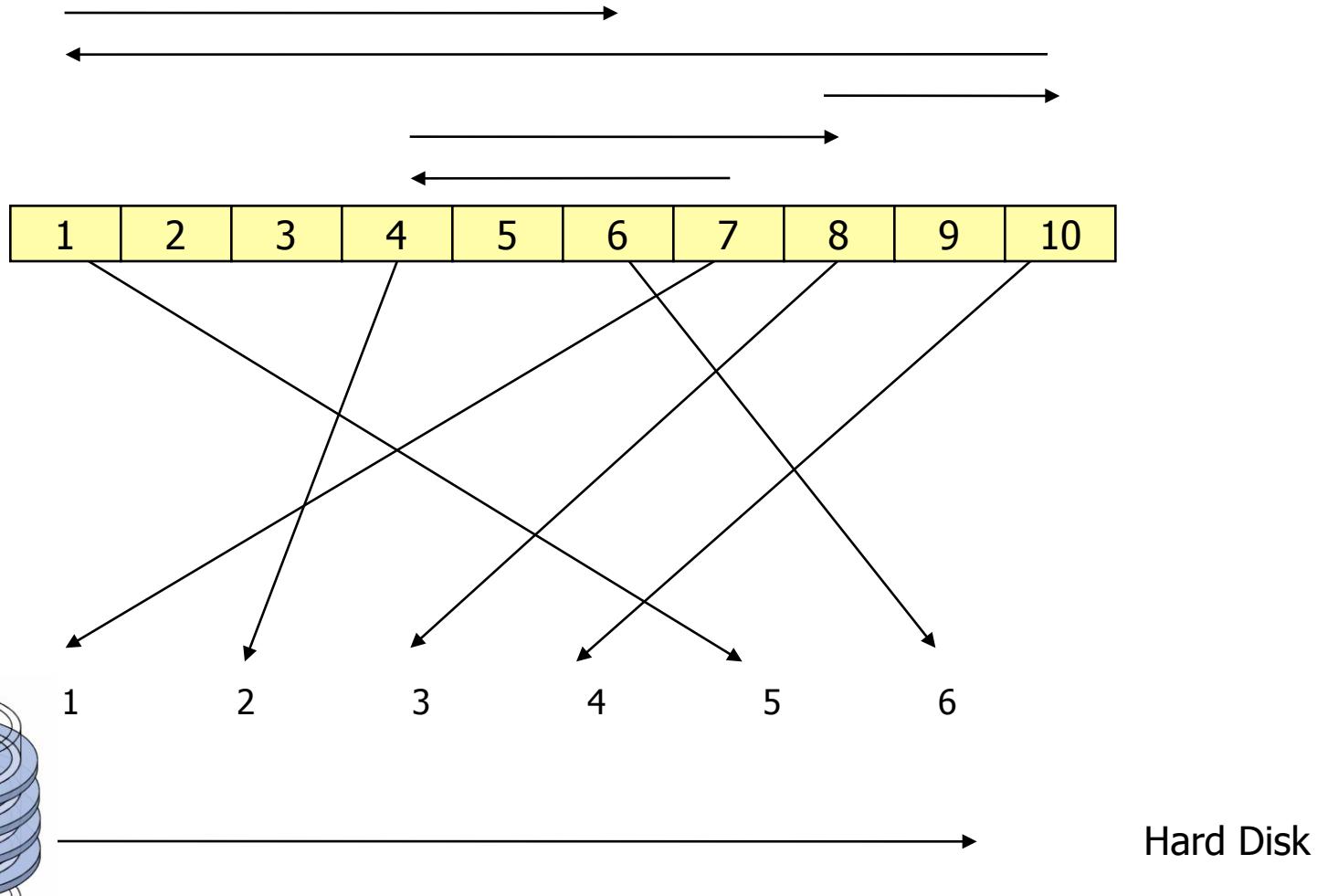
Record # **Tape**

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

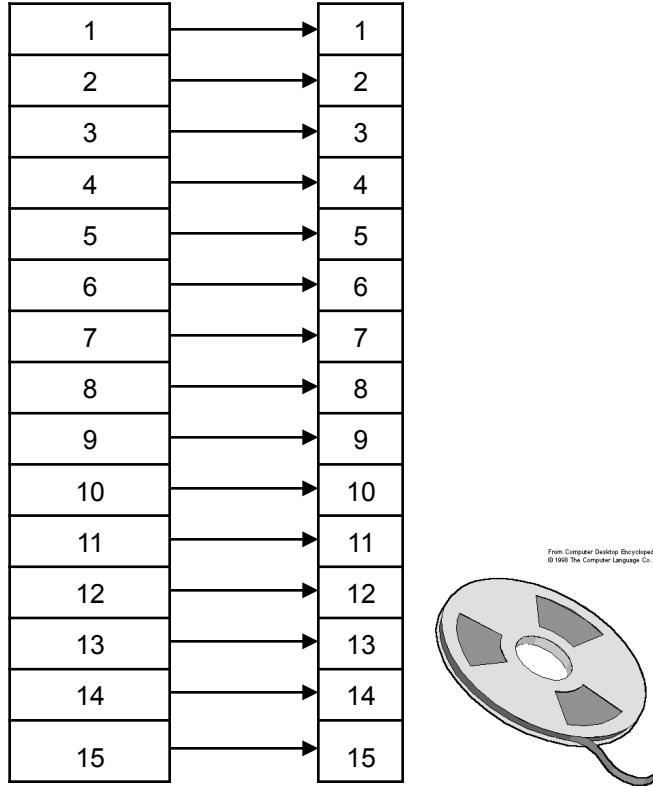
1	Bob	1899
2	Mike	1212311
3	Jim	1312311
4	Alex	31231231
5	Curt	312311
6	Ronny	45564564
7	Bill	4556231
8	Ben	56454
9	Barak	89789471
10	Kit	2311889
11	Nike	48975
12	Jess	3216544
13	Rick	321648947
14	Aims	1218989
15	Betide	7489

Key

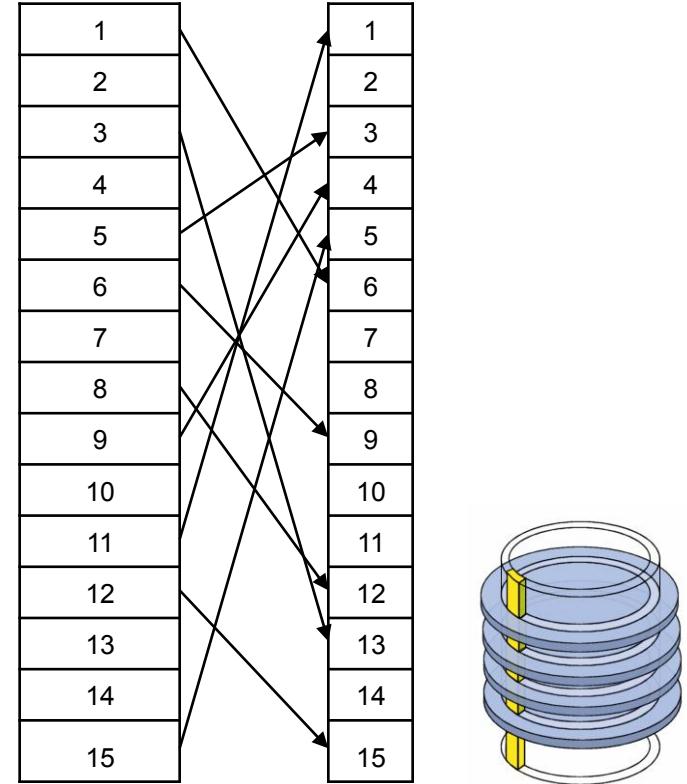
Disk Random Access



Access type

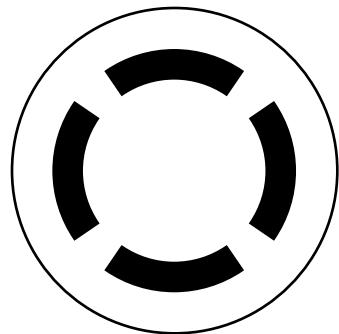


Sequential Access File

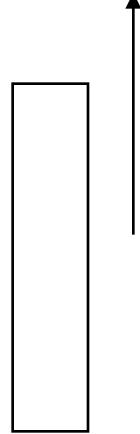
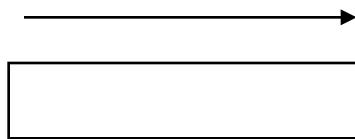


Random Access File

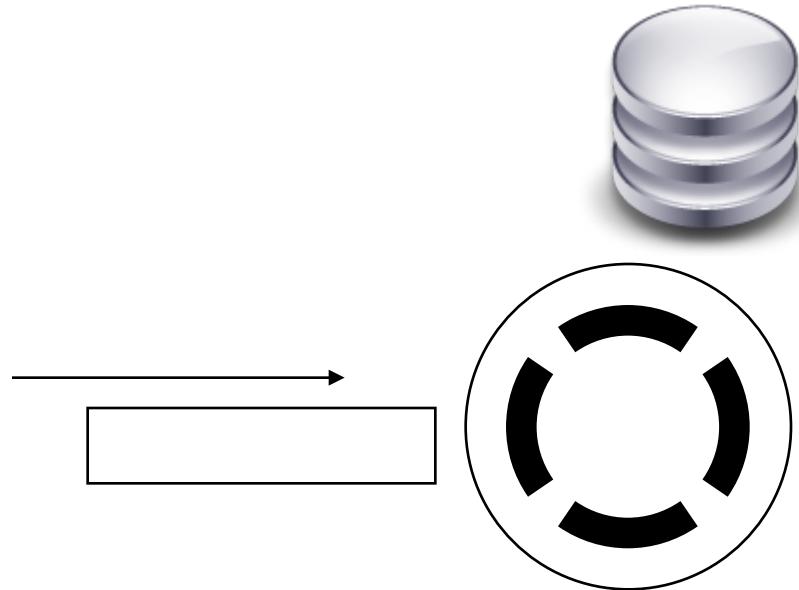
Tape Record Insert



Original



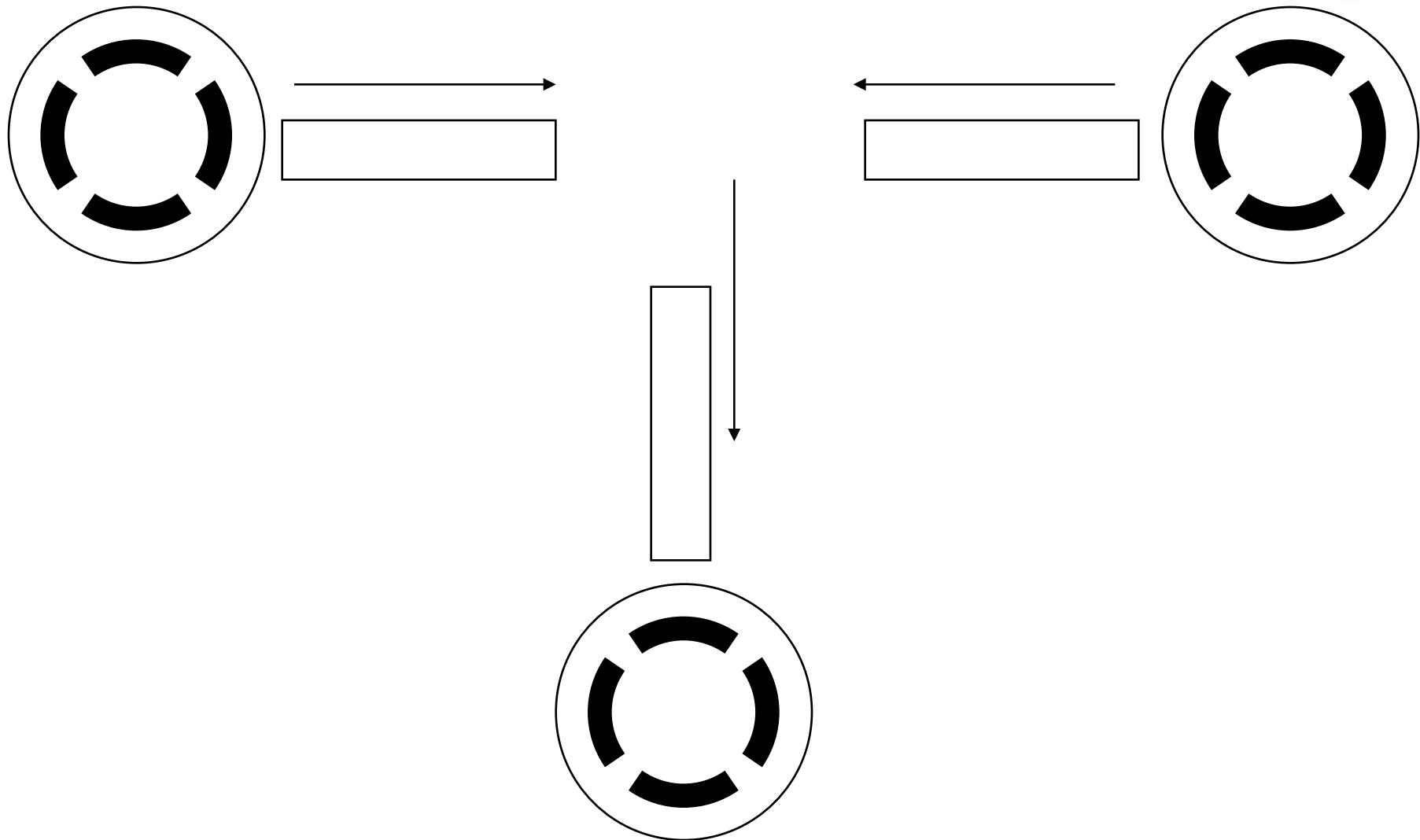
New record



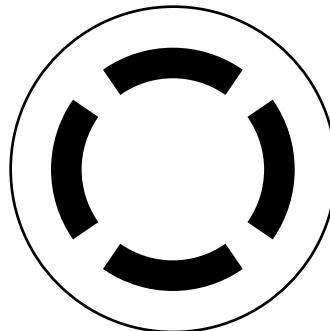
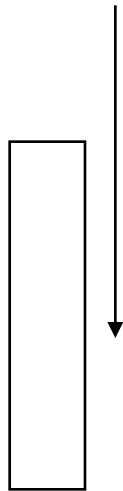
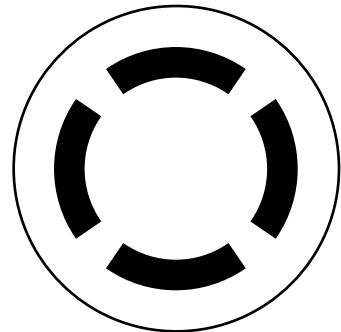
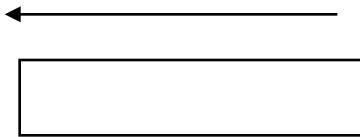
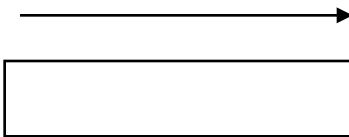
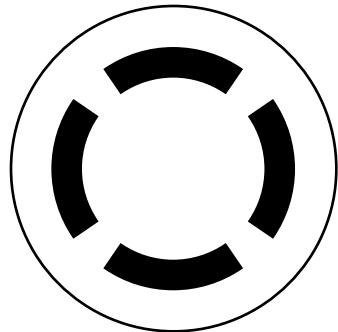
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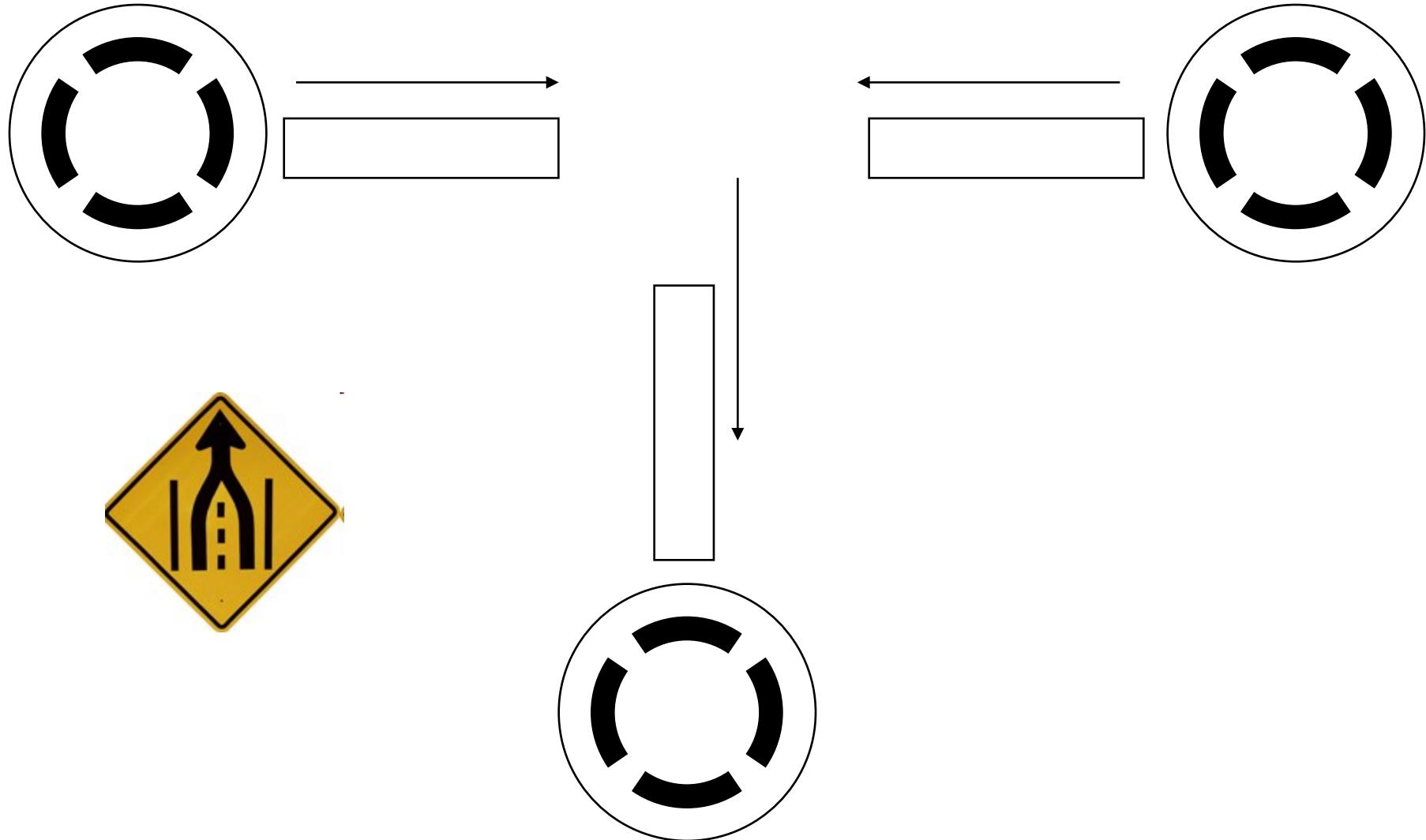
Tape Merge



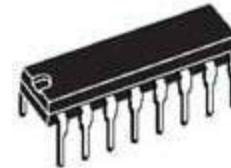
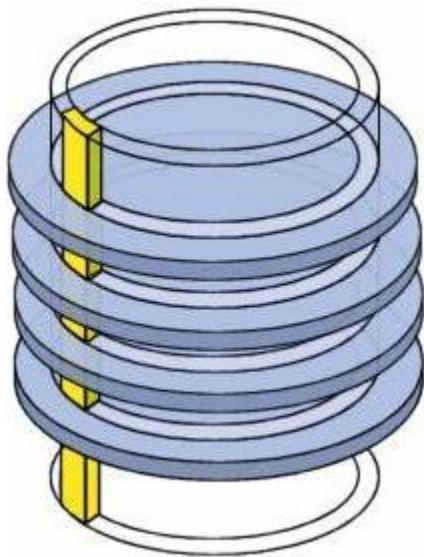
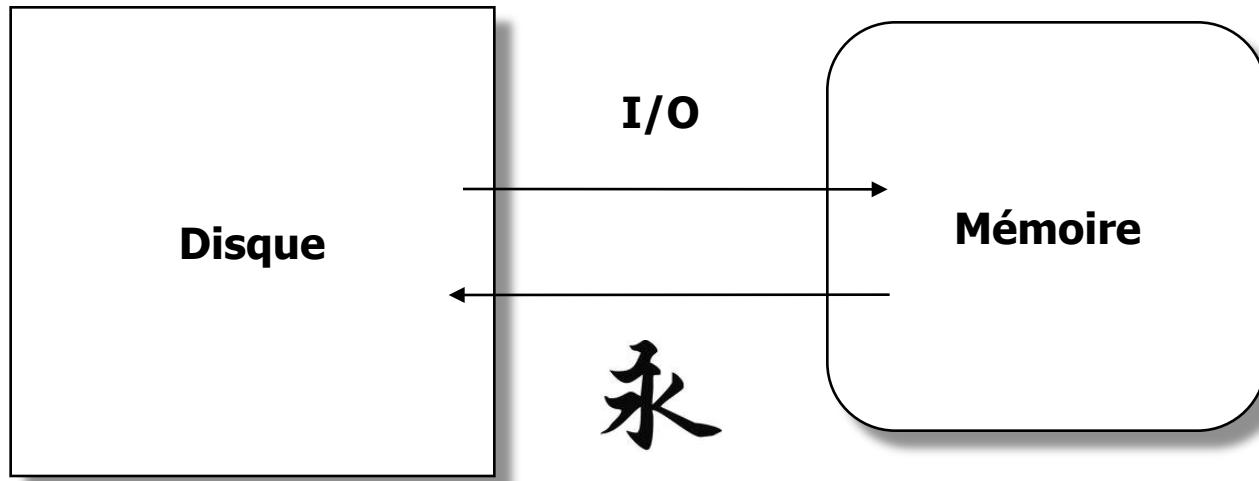
Tape Sort Merge



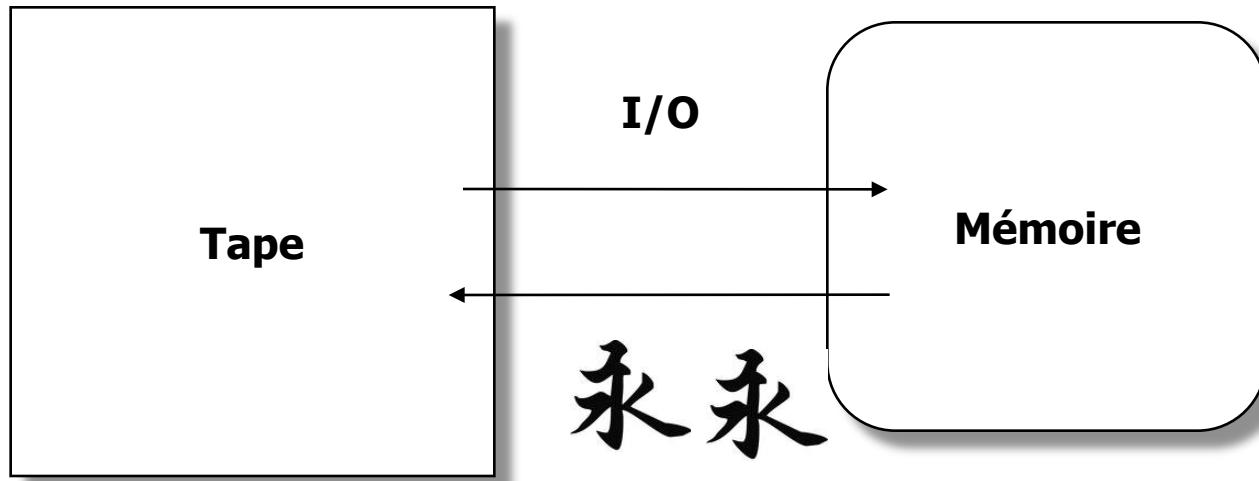
Tape Merge Join



Entrées/Sorties, Lectures écritures disques, IO



Entrées/Sorties, Lectures écritures disques, IO



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