

Numerique et Sciences de l'informatique

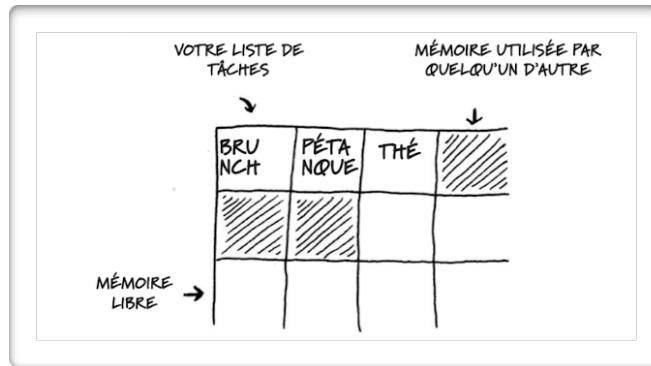
M Tixidor

- **La note de spécialité NSI est la somme de 2 sous-épreuves:**
 - la note d'écrit, 3 exercices, 3h30 de composition: 15 points
 - la note de l'épreuve pratique, 2 exercices, 1h00: 5 points
 1. exercice 1: programmer un algorithme figurant explicitement au programme
 2. exercice 2: compléter un programme « à trous » afin de répondre à une spécification donnée, ajouter des assertions, documenter

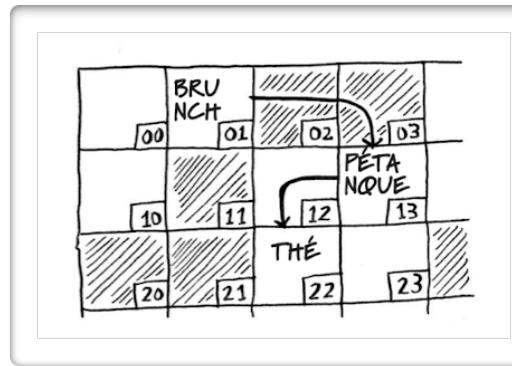
- **Matériel en classe**
 - Classeur :
 - ➊ feuilles blanche à carreaux: cours, contrôles
 - ➋ feuilles colorées: exercices, questions TP, activité de recherche...
- **Matériel numérique**
 - un ordinateur familial ou personnel. Avoir un accès vers une connexion internet
 - ➌ distribution python (Winpython, ou Anaconda)

- Langages
- Structures de données
- Algorithmes
- Architecture des machines et des réseaux
- Bases de données

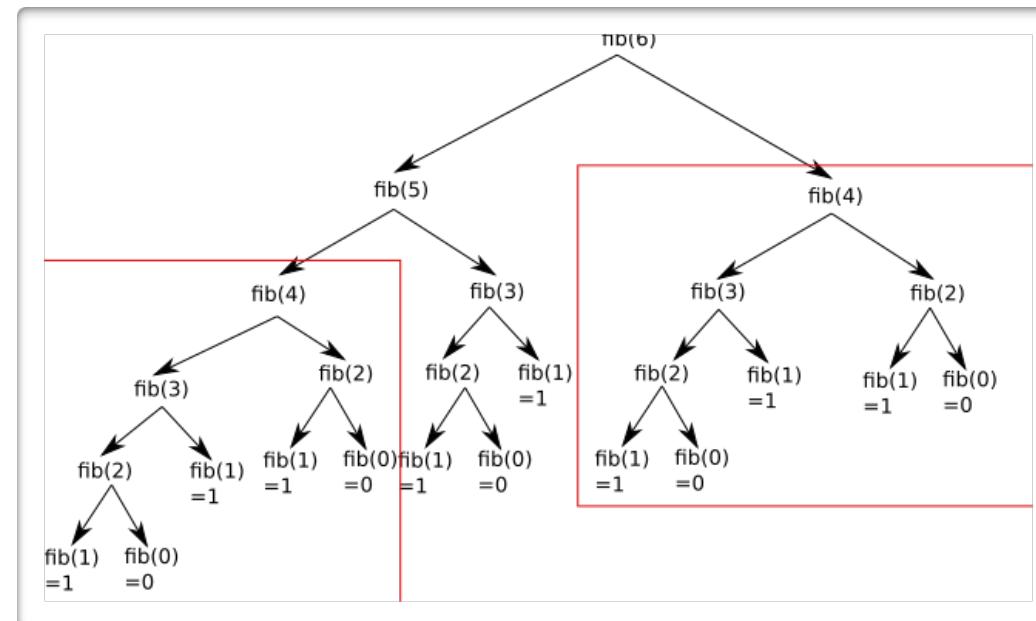
Listes



Listes chainées



Chainage multiple:arbres



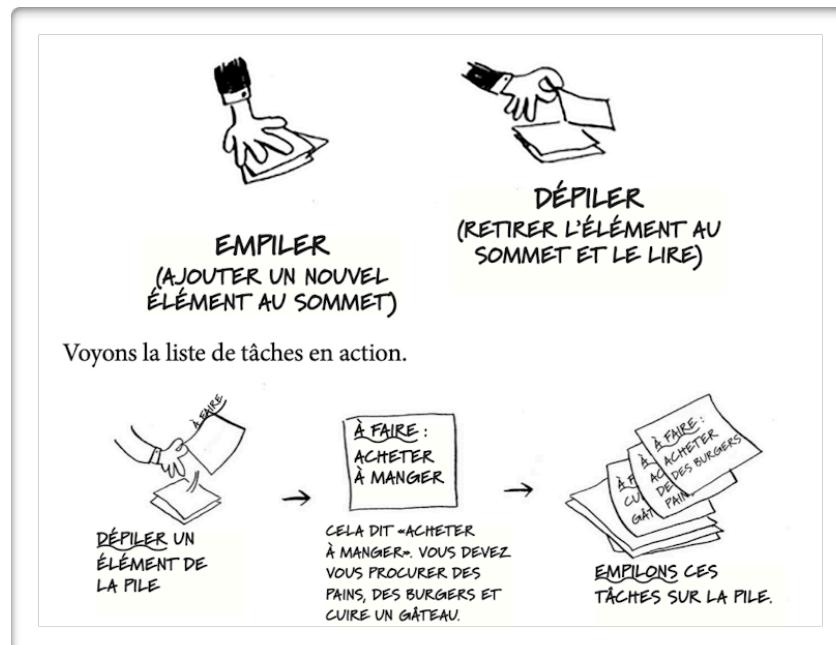
algorithmes de recherche et de tri

~♪~	NOMBRE D'EXÉCUTIONS
RADIOHEAD	156
KISHORE KUMAR	141
THE BLACK KEYS	35
NEUTRAL MILK HOTEL	94
BECK	88
THE STROKES	61
WILCO	111

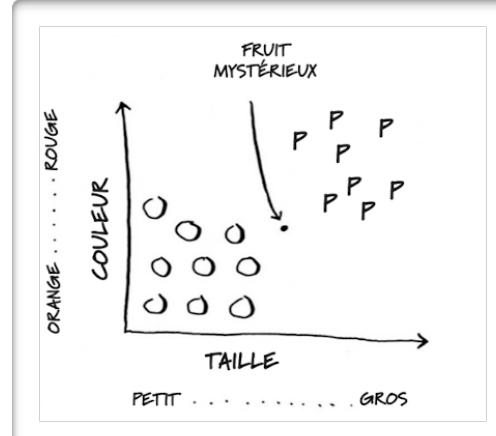
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TRIÉ ☺	NOMBRE D'EXÉCUTIONS
RADIOHEAD	156

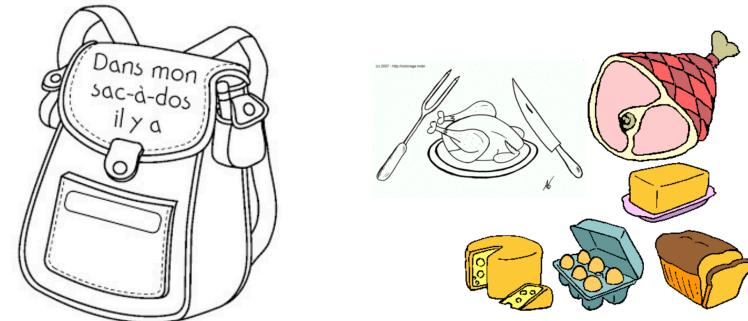
Piles et Files



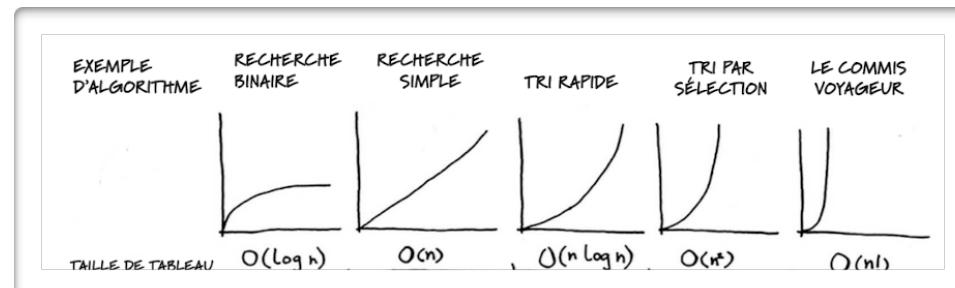
Traitement de données et IA

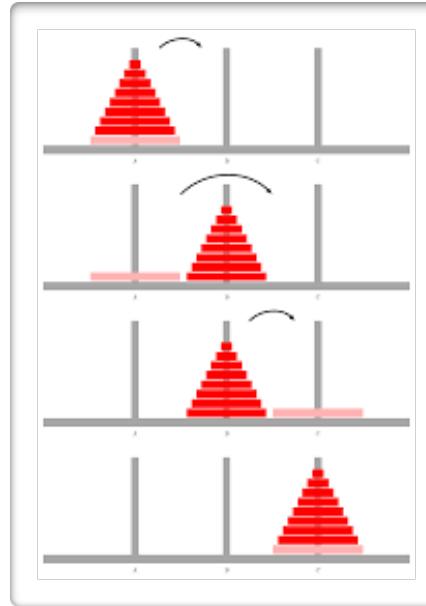


algorithmes gloutons

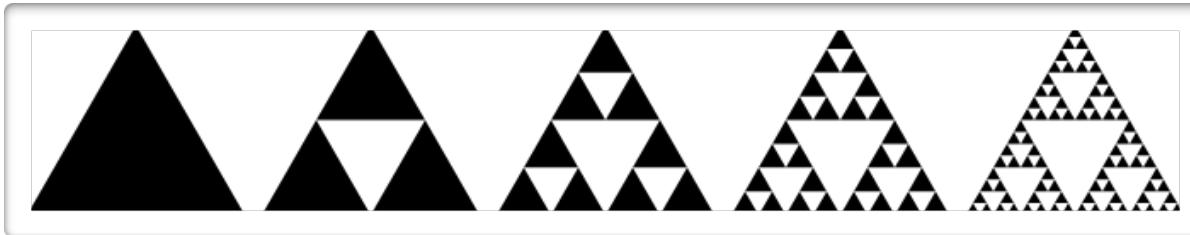


Complexité algorithmique

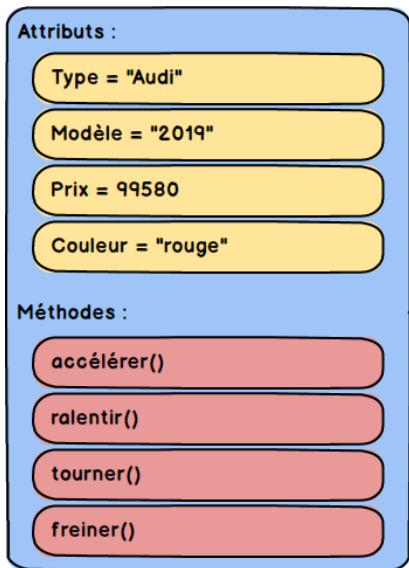




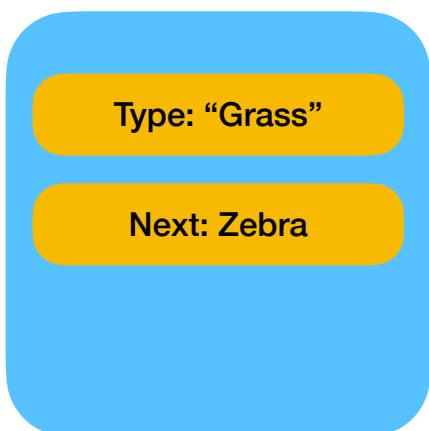
Recursivité

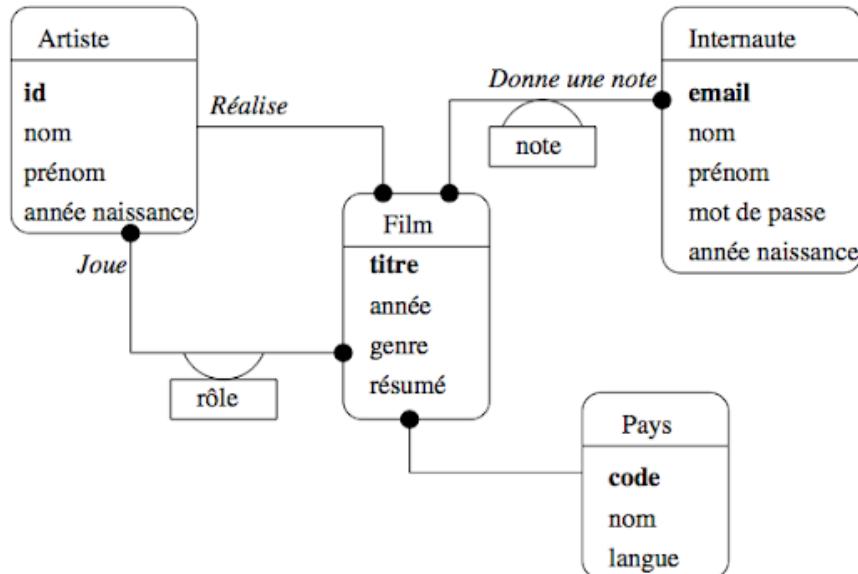


Programmation orientée objet



WayToLearn X





bases de données et langage SQL

DB Browser for SQLite - /Users/richb/Downloads/chinook.db

Database Structure | Browse Data | Edit Pragmas | Execute SQL

Create Table | Create Index | Modify Table

Name | Type | Schema

Tables (13)

- albums
- artists
- customers
 - Customerid
 - FirstName
 - LastName
 - Company
 - Address
 - City
 - State
 - Country
 - PostalCode
 - Phone
 - Fax

Mode: Text | Apply

Editing row=3, column=2
Type: Text / Numeric; Size: 8 character(s)

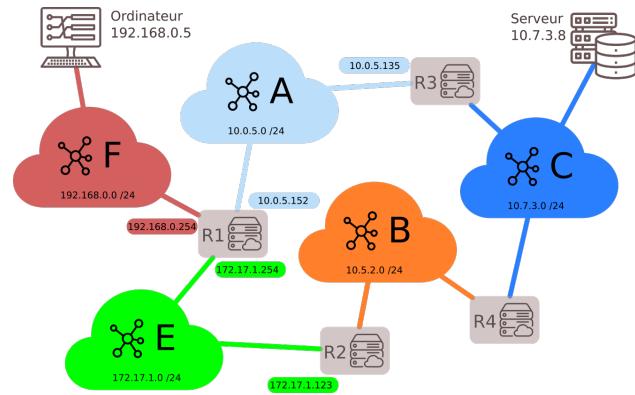
SQL Log | Show SQL submitted by Api | Clear

```

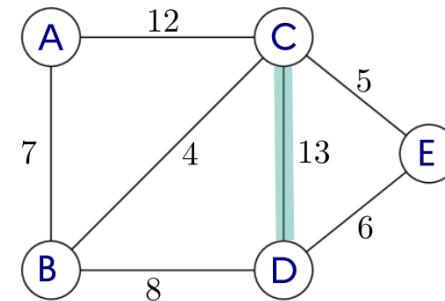
4   PRAGMA encoding;
5   SELECT "_rowid_","*"
6   FROM "ma"
7   SELECT "_rowid_","*"
8   FROM "ma"
9   SELECT "_rowid_","*"
          FROM "ma"
SELECT "_rowid_","*"
          FROM "ma"
  
```

UTF-8

This screenshot shows the DB Browser for SQLite interface. It displays the database structure with tables like albums, artists, and customers. A specific row in the customers table is being edited, showing the first name 'François'. Below the table list, a text input field contains an SQL query, and the bottom right corner shows the current encoding as UTF-8.



reseaux

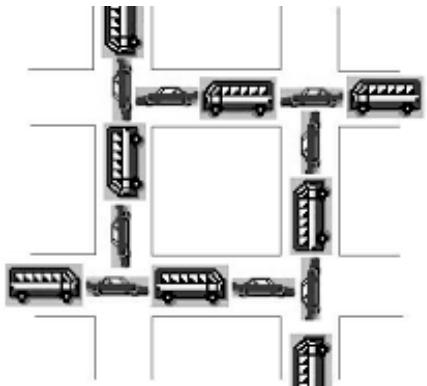


graphes

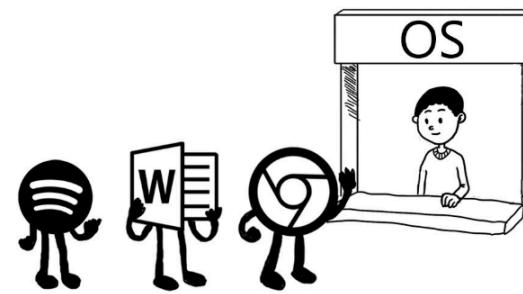
	A	B	C	D	E
A	0	7	12	0	0
B	7	0	4	8	0
C	12	4	0	13	5
D	0	8	13	0	6
E	0	0	5	6	0



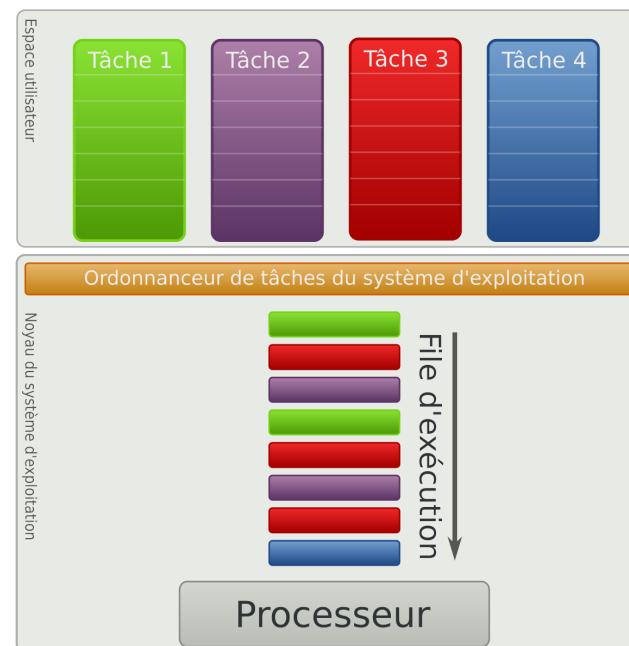
securité



interblocage



système d'exploitation

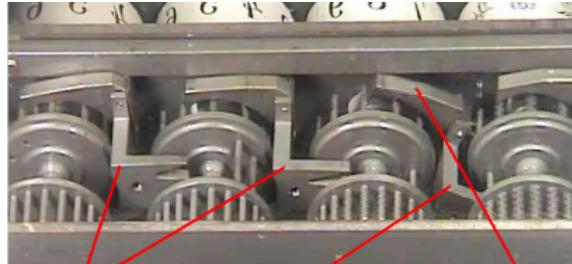


ordonnancement

Pourquoi a-t-on eu
besoin de machines?



Pascaline (1648), premier procédé mécanique de calcul. Une machine qui ne se trompe jamais.



Sautoirs en position "de repos"

Sautoir en cours de retenue

La retenue sera incrémentée ici, sur la roue voisine

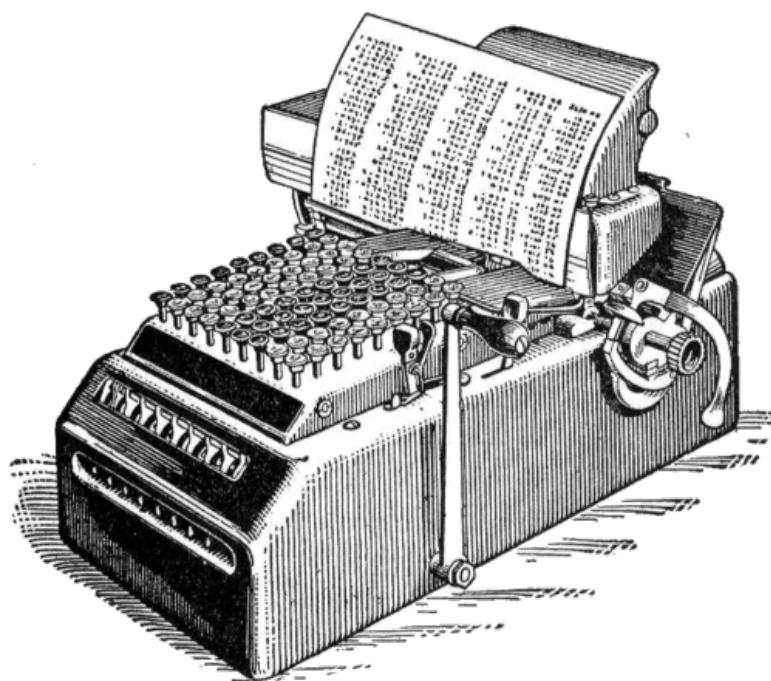
32

Caville 1911		Rattie 1911		Snow 1911		Page	
set 11	for jan	11 oc	set 4	for feb	9 11	jan 21	for jan
Mar 4	for abr	11 oc	ap 10	for abr	9 12	feb 4	for feb
Apr 1	for March	11 oc	May 5	for may	12 13	Feb 26	for feb
May 1	for April	14 oc	June 1	for June	12 14	Mar 11	for mar
May 27	for May	14 oc	July 5	for July	12 15	Mar 11	for mar
Jun 27	for June	14 oc	Aug 5	for Aug	12 16	Apr 8	for apr
July 29	for July	(7 oc)	Sept 5	for Sept	12 17	May 1	for May
Aug 5	for July	(7 oc)	Oct 5	for Oct	12 18	May 17	for May
Aug 27	for Aug	(7 oc)	Nov 5	for Nov	12 19	May 20	for May
Sept 16	for Aug	(7 oc)	Dec 5	for Dec	12 20	May 20	for May
Oct 7	for Sept	(5 oc)			May 21	for May	5.00
Oct 14	for Sept	(9 oc)			May 22	for May	6.50
Oct 21	for Oct	(5 oc)			May 23	for May	7.50
Nov 3	for Oct	(9 oc)			May 24	for May	8.00
Dec 2	for Nov	(6 oc)	Dec 28	for Dec	May 25	for May	10.00
Dec 11	for Nov	(8 oc)	Jan 4	for Jan	May 26	for May	10.00
Dec 31	for Dec	(5 oc)	Jan 18	for Dec	May 27	for May	12.50
Jan 7	for Dec	(8 oc)	Jan 20	for Dec	May 28	for May	12.50
Jan 14	for Jan	14			May 29	for May	12.50
Jan 21	for Feb	14			May 30	for May	12.50

33

Caville 1912				Snow 1912			
set 11	for jan	11 oc	set 4	for feb	9 11	jan 21	for jan
Mar 4	for abr	11 oc	ap 10	for abr	9 12	feb 4	for feb
Apr 1	for March	11 oc	May 5	for may	12 13	Feb 26	for feb
May 1	for April	14 oc	June 1	for June	12 14	Mar 11	for mar
May 27	for May	14 oc	July 5	for July	12 15	Mar 11	for mar
Jun 27	for June	14 oc	Aug 5	for Aug	12 16	Apr 8	for apr
July 29	for July	(7 oc)	Sept 5	for Sept	12 17	May 1	for May
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Sept 16	for Aug	(7 oc)	Dec 5	for Dec	12 20	May 20	for May
Oct 7	for Sept	(5 oc)			May 21	for May	2.50
Oct 14	for Sept	(9 oc)			May 22	for May	4.00
Oct 21	for Oct	(5 oc)			May 23	for May	5.50
Nov 3	for Oct	(9 oc)			May 24	for May	7.00
Dec 2	for Nov	(6 oc)	Dec 28	for Dec	May 25	for May	10.00
Dec 11	for Nov	(8 oc)	Jan 4	for Jan	May 26	for May	12.50
Dec 31	for Dec	(5 oc)	Jan 18	for Dec	May 27	for May	12.50
Jan 7	for Dec	(8 oc)	Jan 20	for Dec	May 28	for May	12.50
Jan 14	for Jan	14			May 29	for May	12.50
Jan 21	for Feb	14			May 30	for May	12.50

vieux livre de comptes



calculatrice mécanique 1914

Aéroplane "Demoiselle" (photo Wikipédia)
Noter le très faible allongement des ailes de forme rectangulaire,
et les fortes trainées induites

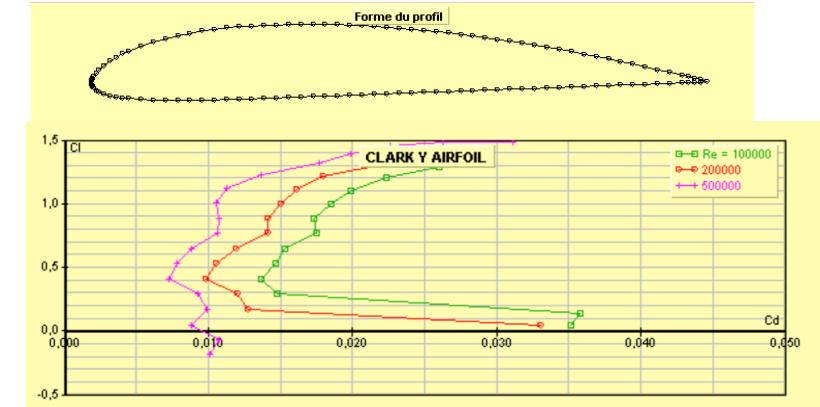


Calculs et mesures des forces sur des profils d'aile (soufflerie du Champs de Mars, Gustave Eiffel, 1909)





Zuse Z3 (allemande, 1941)



Calculs des forces de trainée / portance

Messerschmitt Me 262, premier chasseur à réaction à être utilisé en combat aérien de la Seconde Guerre mondiale

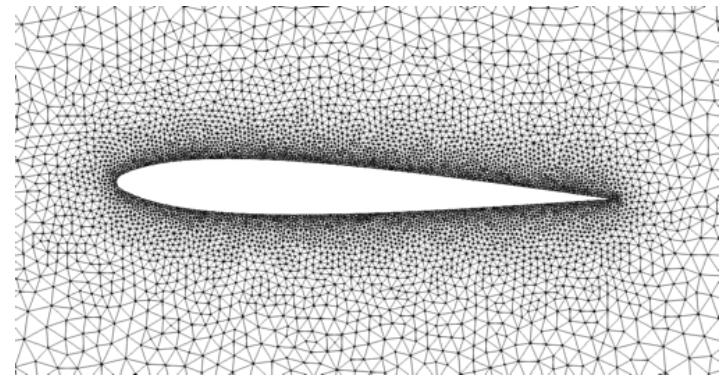
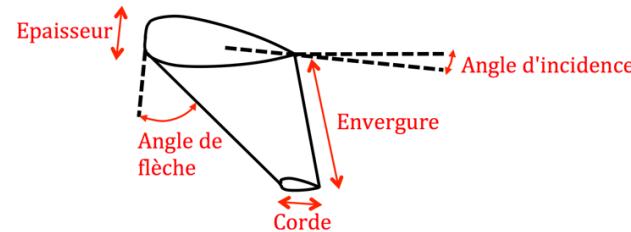




Ordinateur bureau en 2025

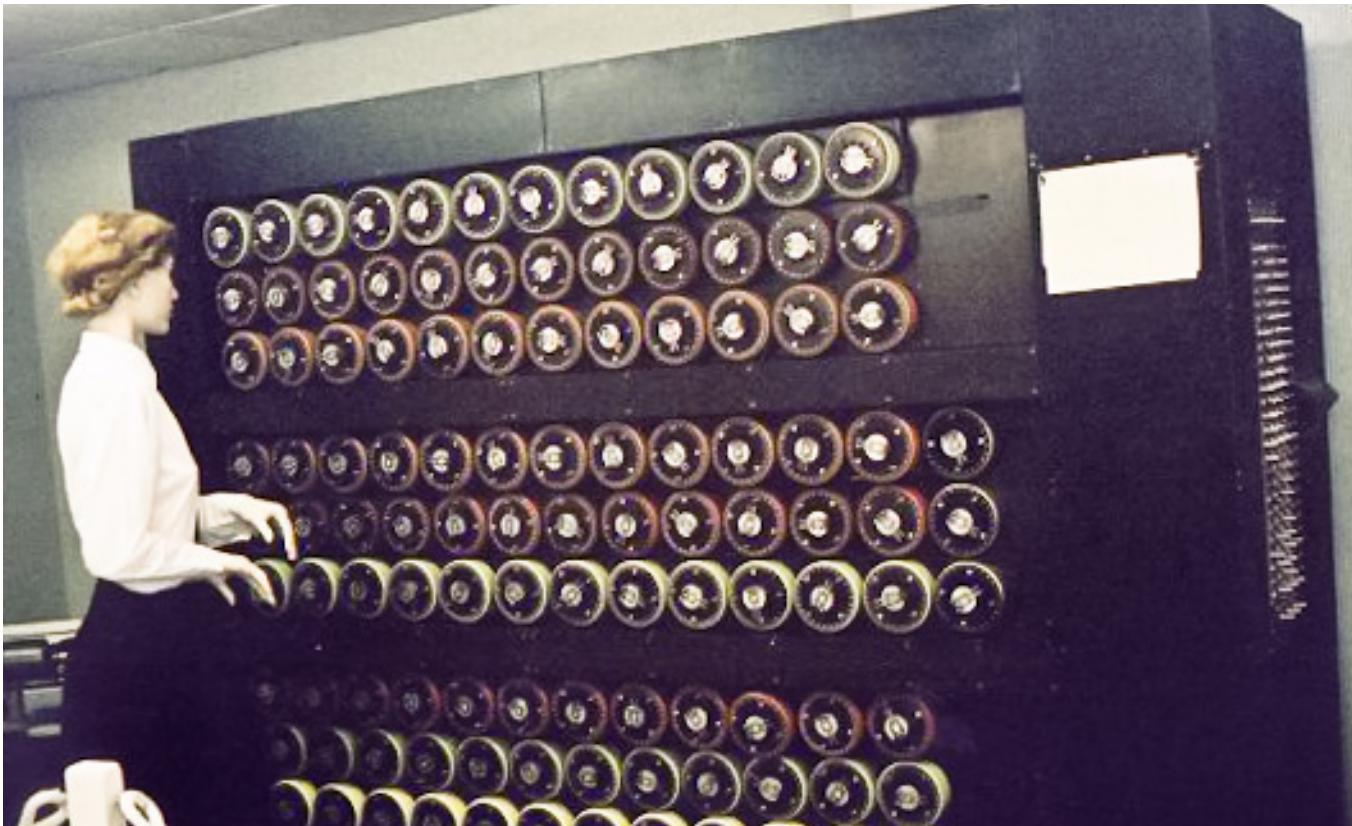


SR-71 Blackbird, avion furtif utilisé par l'armée américaine pendant la Guerre froide

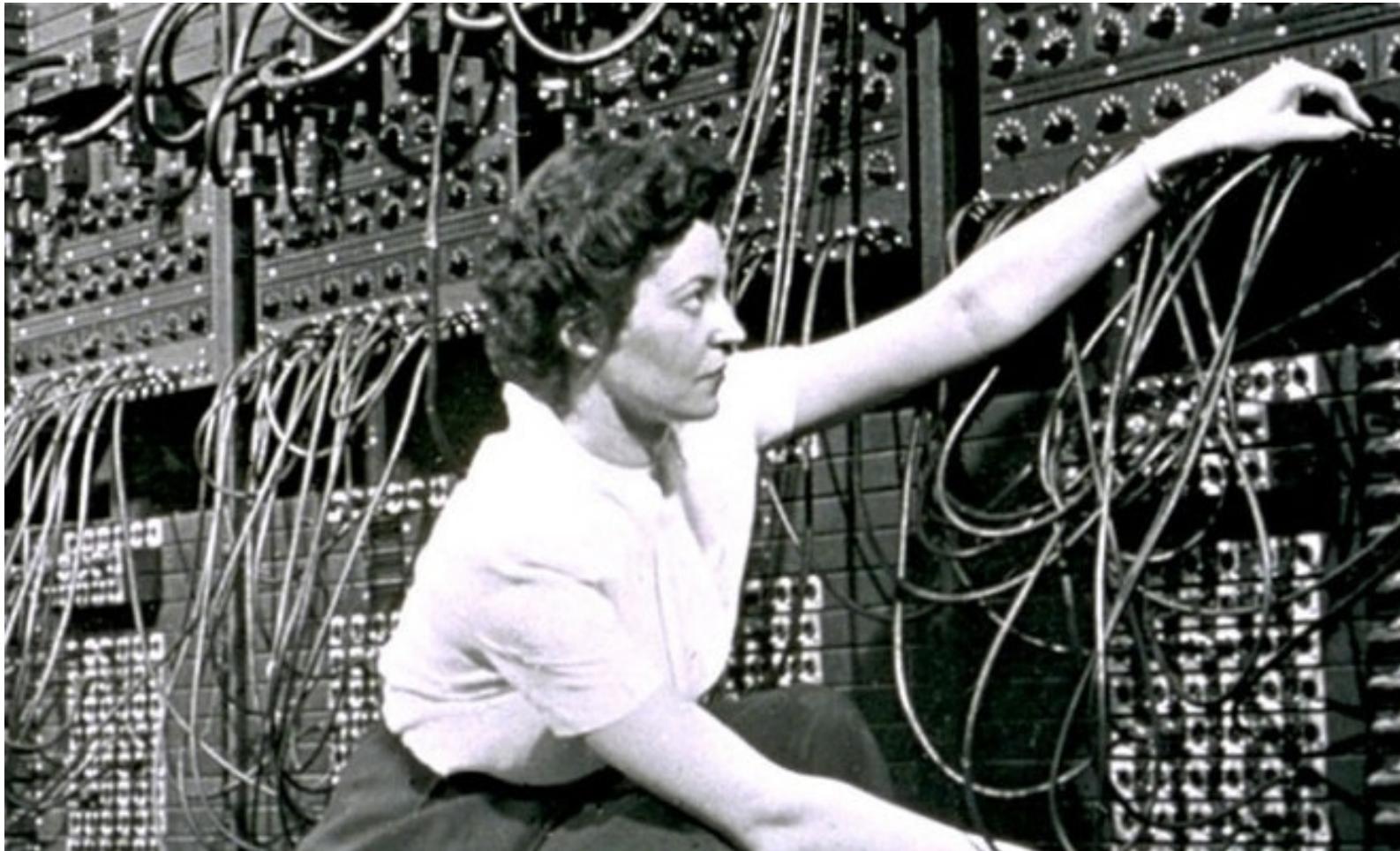


maillage autour d'un profil d'aile
equations de Navier Stockes avec 5
paramètres d'aile (10h de calcul)

<https://interstices.info/la-forme-ideale-d'une-aile/>

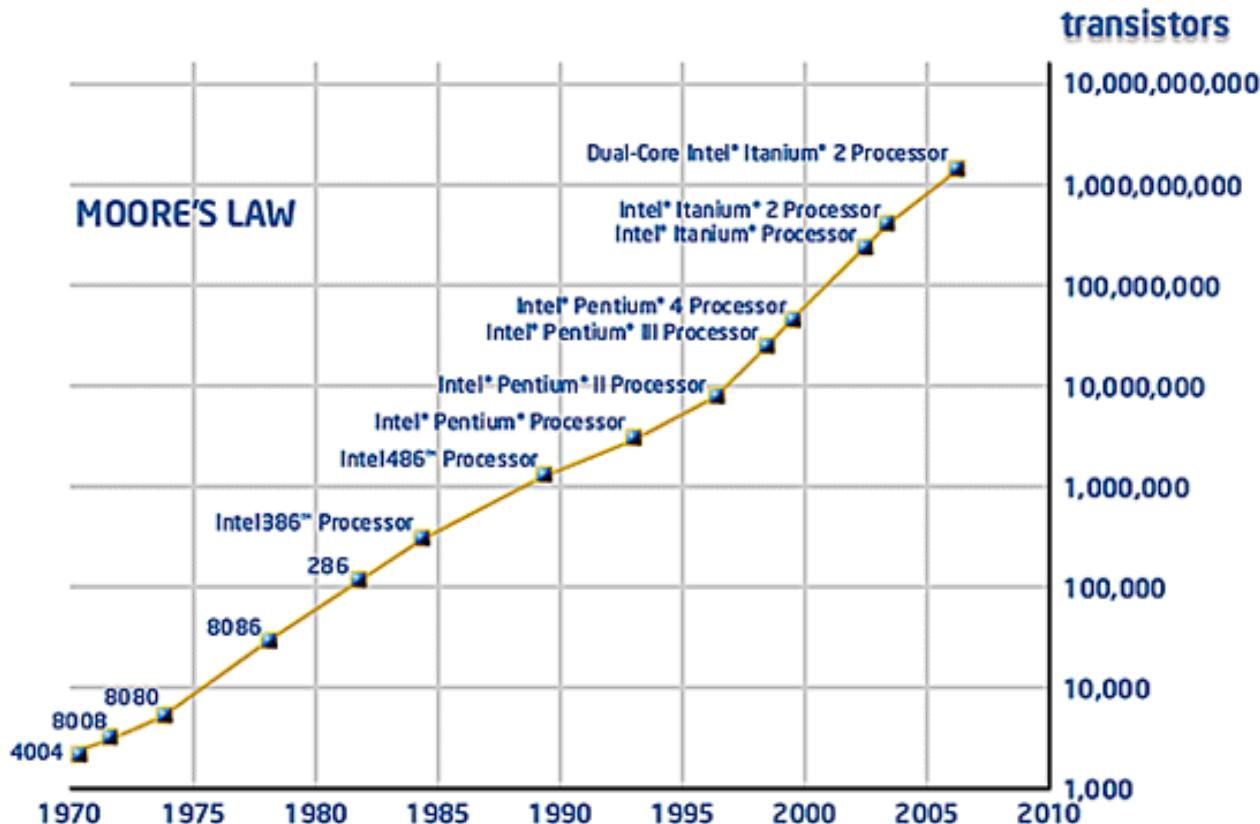


La Bombe (1938-1943)



ENIAC (1945)

Loi de Moore



2012 : Core i7 SandyBridge : 2 270 000 000 transistors

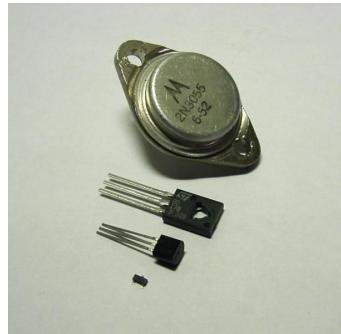
[.01net.com/actualites/30-milliards-de-transistors](http://01net.com/actualites/30-milliards-de-transistors)

Du calcul au traitement de l'information

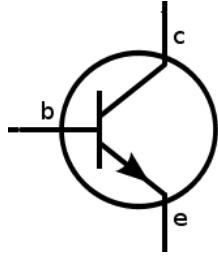
Comment l'ordinateur a-t-il été utilisé pour traiter de l'information?

- 1642: La **Pascaline** est le premier calculateur mécanique. Il a été construit par **Blaise Pascal**
- 1936: Alan Turing traitement de l'information possible par une machine
- 1945: Le premier calculateur électronique à utiliser le **système binaire** est l'**EDVAC**
- 1947: C'est l'invention du **transistor** en 1947 et celle du **circuit intégré** en 1958 qui ont permis la miniaturisation **électronique** des systèmes de traitement de l'information.
- 1973: La première console de jeu, l'**Odyssey**
- 1965 à nos jours: ordinateurs personnels

transistors et bits

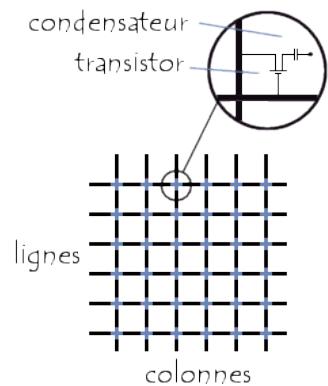


transistor

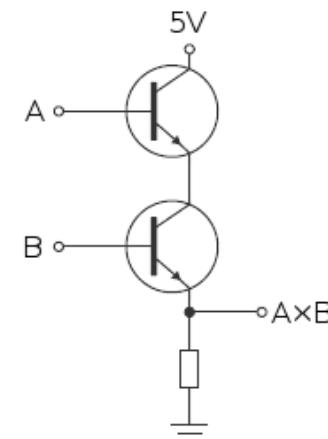


0 or 1

bit = Binary dIgiT



mémoire : stocker les bits



calculs sur les bits

Différents niveaux de complexité

