

Base de Données : Type Colonne

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INTRODUCTION

- NoSQL → Alternative au langage SQL
- Type colonne → Une Méthode NoSQL
- Utilisée par de nombreuses entreprises (Facebook, Google)
- Empilement >> Création d'une nouvelle case



DÉFINITIONS

THÉORÈME DE CAP : *(Eric Brewer)*

- Cohérence
- Haute disponibilité
- Tolérant à la partition

DÉFINITION: BASE DE DONNÉES COLONNE

- Colonnes dynamiques → Valeurs NULL non stockées
- Hiérarchisation des données → Une unique ligne par individu

	A	B	C	D	E
1	foo	bar	hello		
2		Tom			
3			java	scala	cobol

Organisation d'une table dans
une BDD relationnelle

1	A foo	B bar	C hello
2	B Tom		
3	C java	D scala	E cobol

Organisation d'une table dans
une BDD orientée colonnes



EXEMPLE SIMPLE POUR 10 INDIVIDUS

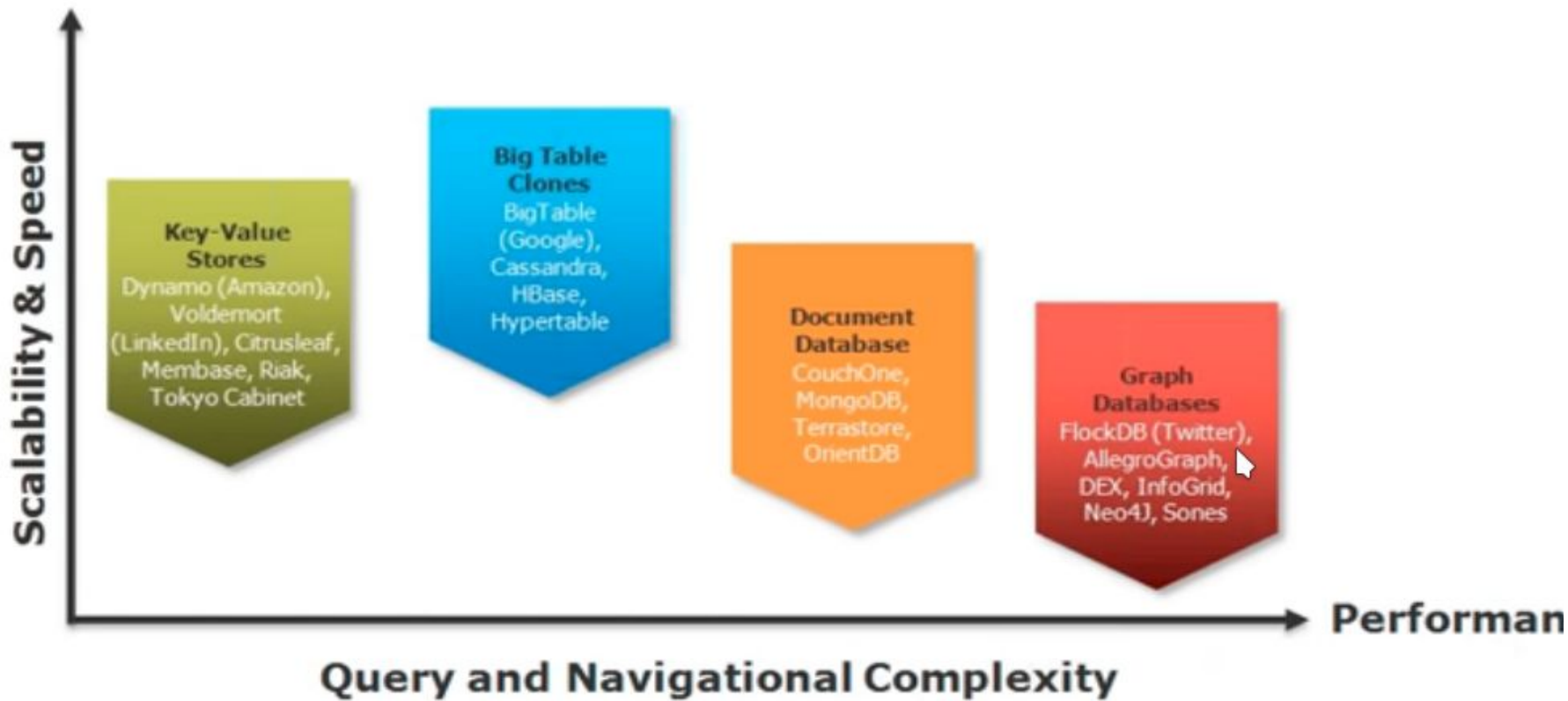
Numero	Modele	Cylindree	Puissance	Poids	Conso
1	Daihatsu Cuore	846	32	650	
2	Suzuki Swift 1.0 GLS	993		790	5,8
3		899	29	730	6,1
4	VW Polo 1.4 60	1390		955	
5	Opel Corsa 1.2i Eco	1195	33	895	6,8
6	Subaru Vivio 4WD	658		740	6,8
7			55	1010	
8	Opel Astra 1.6i 16V	1597	74	1080	7,4
9	Peugeot 306 XS 108	1761	74	1100	9
10	Renault Safrane 2.2. V	2165		1500	11,7



POINTS FORTS

ANALYSE D'ÉNORME JEU DE DONNÉES → BASE DE DONNÉES COLONNE

- Exécution plus rapide des fonctions types : **MIN()**, **MAX()**, **COUNT()**, **AVG()**
- Réunir une multitudes de tables en une → AUTO-INDEXATION



A blonde woman with long hair, wearing a teal off-the-shoulder top, is smiling and waving her right hand. She is standing in the shallow ocean waves. The background shows a clear blue sky with some white clouds and the horizon line of the sea.

Cassandra



En pratique



cassandra



Cassandra en pratique

Étapes :

- Création d'un keyspace
- Création d'une table (column family) et définition des propriétés
- Importation de la base des données
- Requêtes



Exemple de table dans Cassandra

```
[cqlsh:recette> SELECT * FROM car1 ;
```

numero	conso	cylindree	modele	poids	puissance
23	11,3	2496	Opel Omega 2.5i V6	1670	125
5	6,8	1195	Opel Corsa 1.2i Eco	895	33
28	12,7	2473	Volvo 960 Kombi aut	1570	125
10	11,7	2165	Renault Safrane 2.2. V	1500	101
16	7,7	1396	Honda Civic Joker 1.4	1140	66
13	8,8	1998	Citroen ZX Volcane	1140	89
11	9,5	1983	Seat Ibiza 2.0 GTI	1075	85
1	5,7	846	Daihatsu Cuore	650	32
19	11,7	2972	Hyundai Sonata 3000	1400	107
8	7,4	1597	Opel Astra 1.6i 16V	1080	74
2	5,8	993	Suzuki Swift 1.0 GLS	790	39
4	6,5	1390	VW Polo 1.4 60	955	44
18	6,6	1242	Ford Fiesta 1.2 Zetec	940	55
15	8,6	1390	Fort Escort 1.4i PT	1110	54
22	7,6	1998	Mitsubishi Galant	1300	66
27	12,8	2438	Toyota Previa salon	1800	97
20	11,9	2958	Lancia K 3.0 LS	1550	150
7	7,1	1331	Toyota Corolla	1010	55
6	6,8	658	Subaru Vivio 4WD	740	32
9	9,0	1761	Peugeot 306 XS 108	1100	74
14	9,3	1580	Fiat Tempra 1.6 Liberty	1080	65
26	11,6	1984	Seat Alhambra 2.0	1635	85
21	10,8	2497	Mazda Hachtback V	1330	122
17	10,8	2435	Volvo 850 2.5	1370	106
24	10,8	1998	Peugeot 806 2.0	1560	89
25	9,2	1997	Nissan Primera 2.0	1240	92
12	9,5	1984	VW Golt 2.0 GTI	1155	85
3	6,1	899	Fiat Panda Mambo L	730	29

id	contributor_id	minutes	n_ingredients	n_steps	name	nutrition	submitted
265902	258285	85	12	9	sausage bean and cabbage soup	{268.9; 16.0; 21.0; 49.0; 22.0; 13.0; 11.0}	2007-11-15
176996	89831	45	8	6	0 fat chunky watermelon salsa	{57.7; 0.0; 39.0; 0.0; 2.0; 0.0; 4.0}	2006-07-10
143843	43642	80	9	16	almond ginger biscotti	{82.9; 5.0; 18.0; 1.0; 5.0; 1.0; 3.0}	2005-11-04
77328	89831	25	10	8	best double chocolate muffins	{254.8; 23.0; 34.0; 13.0; 10.0; 34.0; 9.0}	2003-11-26
296870	719313	60	9	19	orange kissed turnip custards	{110.4; 2.0; 48.0; 8.0; 18.0; 1.0; 5.0}	2008-04-07
251574	124416	40	5	6	peasant sauce it s what to do with all those fresh tomatoes	{231.2; 28.0; 33.0; 27.0; 4.0; 12.0; 5.0}	2007-09-07
84757	73836	35	5	7	breakfast trout with bacon	{712.9; 68.0; 0.0; 13.0; 105.0; 42.0; 7.0}	2004-02-22
54191	71162	40	7	6	simple basic quiche	{481.9; 50.0; 16.0; 23.0; 38.0; 69.0; 9.0}	2003-02-16
155320	283804	40	9	9	baked tilapia with white wine and herbs	{515.2; 23.0; 58.0; 7.0; 98.0; 42.0; 12.0}	2006-02-08
117179	207176	390	11	8	mom s thanksgiving carrot mold	{540.4; 54.0; 103.0; 17.0; 9.0; 44.0; 17.0}	2005-04-14
203429	336790	620	8	6	jean s western omelet in a crock pot	{1419.7; 144.0; 13.0; 143.0; 178.0; 199.0; 17.0}	2007-01-05
224042	329769	10	3	4	cream cheese capsicum and parsley dip	{35.1; 4.0; 1.0; 2.0; 2.0; 9.0; 0.0}	2007-04-23
340918	226066	100	11	15	ww spinach lasagna	{329.9; 20.0; 32.0; 31.0; 55.0; 35.0; 8.0}	2008-12-02
143615	212088	30	6	10	caramels	{2241.0; 134.0; 1196.0; 50.0; 27.0; 276.0; 123.0}	2005-11-02
130533	201614	25	7	6	salmon with pesto crust	{877.8; 86.0; 9.0; 21.0; 136.0; 122.0; 7.0}	2005-07-19
123410	160974	10	5	12	tuna egg chicken salad dressing all purpose	{83.6; 11.0; 4.0; 4.0; 1.0; 11.0; 1.0}	2005-05-23
406126	495793	20	5	8	warm goat cheese toasts with honey rosemary and walnuts	{105.9; 7.0; 17.0; 4.0; 8.0; 10.0; 3.0}	2009-12-31
39433	20754	45	8	5	crusty fried chicken	{698.5; 82.0; 0.0; 17.0; 69.0; 47.0; 6.0}	2002-09-04
344099	240629	45	13	10	pecan bisque	{324.0; 51.0; 6.0; 28.0; 9.0; 53.0; 1.0}	2008-12-17
96748	46731	30	8	9	simple irish stew	{1107.1; 79.0; 35.0; 11.0; 162.0; 106.0; 25.0}	2004-08-02
362589	1212132	7	5	2	c p a burgers	{305.9; 20.0; 34.0; 3.0; 36.0; 25.0; 9.0}	2009-03-24
420191	1594578	60	13	21	4 cheese mac n bacon	{544.5; 39.0; 36.0; 46.0; 60.0; 75.0; 15.0}	2010-04-13
451663	96177	25	12	8	lemon oatmeal cookies	{252.7; 14.0; 86.0; 3.0; 7.0; 18.0; 13.0}	2011-03-26
91274	88028	70	9	13	pretzel dough	{214.3; 4.0; 11.0; 43.0; 10.0; 7.0; 13.0}	2004-05-14
230875	65720	45	14	18	maryland crab imperial	{454.6; 42.0; 12.0; 27.0; 56.0; 59.0; 5.0}	2007-05-28
62602	80353	7	9	7	veal scallops with lemon and capers	{472.7; 43.0; 2.0; 33.0; 67.0; 56.0; 4.0}	2003-05-20
37032	33159	25	9	7	hot spicy chicken burgers	{190.8; 3.0; 29.0; 19.0; 56.0; 2.0; 4.0}	2002-08-13
373061	526666	60	8	12	pecan florentines	{91.2; 9.0; 27.0; 0.0; 2.0; 11.0; 3.0}	2009-05-20
502821	204024	20	6	6	green onion rice	{509.6; 3.0; 3.0; 45.0; 66.0; 1.0; 28.0}	2013-07-02
265305	516818	10	10	6	black eyed peas supper	{773.0; 69.0; 62.0; 68.0; 57.0; 78.0; 20.0}	2007-11-13
180182	322326	25	7	8	vanilla biscuits cookies	{226.7; 13.0; 76.0; 4.0; 5.0; 27.0; 11.0}	2006-08-01
228419	219942	50	7	4	hawaiian fruit with pina colada dip	{48.2; 2.0; 24.0; 0.0; 3.0; 5.0; 2.0}	2007-05-17
63461	80353	60	6	12	sticky chicken ii	{722.3; 64.0; 102.0; 91.0; 110.0; 59.0; 9.0}	2003-06-02
229235	457029	66	12	4	victory s country comfort meatloaf	{3455.7; 280.0; 572.0; 271.0; 464.0; 343.0; 70.0}	2007-05-21
125042	170240	20	7	6	penne alla vodka	{1011.1; 82.0; 10.0; 20.0; 81.0; 25.0; 20.0}	2010-02-14



Quelques requêtes :

```
[cqlsh:toto> select avg(n_ingredients), avg(minutes), avg(n_steps) from toto;
```

<code>system.avg(n_ingredients)</code>	<code>system.avg(minutes)</code>	<code>system.avg(n_steps)</code>
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9	9398	9
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(1 rows)

<code>name</code>	<code>system.max(minutes)</code>
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<code>sausage bean and cabbage soup</code>	2147483647
--	------------

(1 rows)


```
cqlsh:toto> select * from toto where minutes > 20000 allow filtering;
```

id	contributor_id	minutes	n_ingredients	n_steps	name	nutrition	submitted
261647	464080	2147483647	8	9	no bake granola balls	{330.3; 23.0; 110.0; 4.0; 15.0; 24.0; 15.0}	2007-10-26
127193	190230	20175	5	5	pickled turnips	{319.1; 1.0; 154.0; 318.0; 18.0; 0.0; 21.0}	2005-06-23
13831	20371	21660	9	26	friendship fruitcake and starter with brandy	{2234.4; 133.0; 1359.0; 24.0; 53.0; 65.0; 119.0}	2001-11-06
359135	1016173	43205	3	6	easy homemade wine	{1559.5; 0.0; 1596.0; 0.0; 2.0; 0.0; 133.0}	2009-03-04
101082	53425	60540	7	19	dill pickles by the jar	{2.9; 0.0; 1.0; 14.0; 0.0; 0.0; 0.0}	2004-10-01
72355	6357	20160	2	6	garlic oil	{7.7; 1.0; 0.0; 0.0; 0.0; 0.0; 0.0}	2003-10-02
24478	32692	20160	3	5	marijuana vinegar	{3.1; 0.0; 0.0; 0.0; 0.0; 0.0; 0.0}	2002-04-08
26952	23302	30300	18	7	branston pickle	{38.5; 0.0; 28.0; 4.0; 1.0; 0.0; 3.0}	2002-04-30
104976	66983	28810	6	3	owen bars	{146.8; 14.0; 48.0; 2.0; 3.0; 27.0; 4.0}	2004-11-29
37202	51641	30270	4	26	sauerkraut with dill by sy	{56.8; 0.0; 29.0; 1.0; 5.0; 0.0; 4.0}	2002-08-13
108683	171303	21610	9	13	spaghetti with asparagus smoked mozzarella and prosciutto	{413.1; 25.0; 13.0; 8.0; 35.0; 26.0; 16.0}	2005-01-18
441587	31807	20160	4	5	quick salt pork	{126.2; 8.0; 6.0; 74.0; 33.0; 9.0; 0.0}	2010-11-10
242032	331364	132495	3	4	nut wine	{129.6; 3.0; 111.0; 0.0; 1.0; 1.0; 9.0}	2007-07-23



CONCLUSION

A photograph of three people walking on a city street. In the foreground, a young woman with long brown hair, wearing a red sleeveless top, is smiling and looking towards the camera. To her right, a young man with dark skin and short hair, wearing a blue and white plaid shirt, is looking back over his shoulder at the camera with a slight smile. Further to the right, another young woman with long brown hair, wearing a light blue sleeveless top, is looking back over her shoulder at the camera with a slight smile. The background is a blurred city street with other pedestrians and buildings.

**Base de
données
orientée
colonnes**

**Base de
données
SGBDR**



Bibliographie

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