

CS6200



Information Retrieval

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Northeastern University


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Easy Peezy Pizza Dough Bread Machine Pizza ... - Food.com
 www.food.com/.../easy-peezy-pizza-dough-bread... ▾ Food.com ▾
★★★★★ Rating: 5 - 258 reviews - 3 hr 15 min - 1727.2 cal
This is a really easy way to make a good yeasty **pizza dough**! As well as using this recipe for when I'm making pizza, I also use it for when I'm making a focaccia ...

Bread Machine Thin Crust Pizza Dough Recipe - Allrecipes ...
 [allrecipes.com > ... > Sauces and Condiments](http://allrecipes.com/.../Sauces and Condiments) ▾ Allrecipes.com ▾
★★★★★ Rating: 4.5 - 71 reviews - 1 hr 15 min - 126 cal
Use your **bread machine** to make a thin, chewy, flavorful **pizza crust** with just a few basic ingredients.

Bread-Machine Pizza Dough | Williams-Sonoma
 www.williams-sonoma.com/.../bread-mac... ▾ Williams-Sonoma ▾
This **pizza dough** couldn't be easier to prepare. Just combine the ingredients in a **bread machine** and process as directed. The recipe makes enough dough for ...

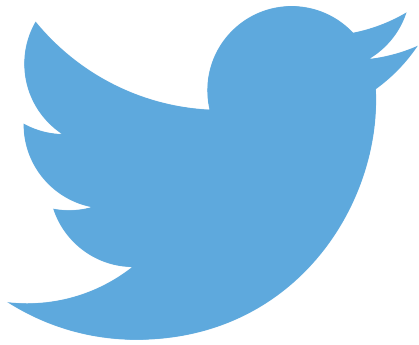
Pizza Dough Recipe : Bobby Flay : Food Network
 www.foodnetwork.com/.../pizza-dough-recipe... ▾ Food Network ▾
★★★★★ Rating: 4.8 - 291 reviews - 1 hr 30 min
Bread flour makes the crust palpably more delicate and crunchier; far better suited to I used my **breadmaker** on the **pizza dough** setting (just put everything in ...

Search Engines

Google

YAHOO!

 bing



facebook®

You Tube



Slides

The slides of this course are based on the book:

Search Engines: Information Retrieval in Practice. Croft, Metzler and Strohman (e-book 2015).

Other resources include:

Introduction to Information Retrieval.
Manning, Raghavan, and Schütze (Cambridge).

Lucene in Action, Second Edition.
Michael McCandless, Erik Hatcher, and Otis Gospodnetić

David Smith IR lectures, Northeastern University
James Allan IR lectures, UMass Amherst
Jacques Savoy IR lectures, Université de Neuchâtel

About 675,000,000 results (0.45 seconds)

Pizza Hut® \$10 Any Pizza - PizzaHut.com
www.pizzahut.com/Deals ▾

Our Any Size Pizza w/ Any Toppings Deal is Back! Order Online Today.

Ratings: Selection 9/10 - Value 9/10 - Ease of use 9/10 - Order accuracy 9/10

Domino's.com: Domino's Home Page - Domino's Pizza ...
<https://www.dominos.com/> ▾ Domino's Pizza ▾

Domino's Pizza. Browse coupons & order Domino's online for delivery or pick up.

Menu has specialty pizza, pasta, chicken wings, cheesy bread, sandwiches, ...

[Order Online](#) - [Menu](#) - [Tracker](#) - [Www.dominosbiz.com home](#)**pizza**

Rating ▾ Price ▾ Hours ▾

Pantry Pizza

4.4 ★★★★★ 32 reviews · \$ · Pizza

Dorchester Ave · Subs, wraps, pizza & other casual eats fill out the big menu at this chill eatery with yellow walls.

**Sal's Pizza**

3.9 ★★★★★ 9 reviews · \$\$ · Pizza Delivery

L St · Quick-serve joint for Sicilian-American style pizza, pasta, panini, salads & subs.

**The Avenue Grille and Pizzeria**

4.5 ★★★★★ 26 reviews · \$\$ · Fast Food

Dorchester Ave · Eclectic restaurant turning out Italian, American & Mexican offerings, including specialty pies.


[More pizza](#)
Pizza in Boston - Yelp
www.yelp.com/c/boston/pizza ▾ Yelp ▾

The Best Pizza in Boston on Yelp. Read about places like: Casa Razdora, Galleria Umberto, Monica's Mercato & Salumeria, Roy's Cold Cuts, Regina Pizza, ...

Pizza Hut - Pizza Coupons, Pizza Deals, Pizza Delivery ...
<https://www.pizzahut.com/> ▾ Pizza Hut ▾

Order pizza online for fast pizza delivery or drop by for carryout. You may also contact Pizza Hut and find out about our catering services for your next big event.

Pizza - Wikipedia, the free encyclopedia
<https://en.wikipedia.org/wiki/Pizza> ▾ Wikipedia ▾
[More images](#)**Pizza**

Dish

Pizza is a flatbread generally topped with tomato sauce and cheese and baked in an oven. It is commonly topped with a selection of meats, vegetables and condiments. [Wikipedia](#)

Nutrition Facts

Pizza, 14" regular crust ▾

Amount Per 1 slice (107 g) ▾**Calories** 285

			% Daily Value*
Total Fat 10 g			15%
Saturated fat 4.8 g			24%
Polyunsaturated fat 1.8 g			
Monounsaturated fat 2.8 g			
Trans fat 0.3 g			
Cholesterol 18 mg			6%
Sodium 640 mg			26%
Potassium 184 mg			5%
Total Carbohydrate 36 g			12%
Dietary fiber 2.5 g			10%
Sugar 3.8 g			
Protein 12 g			24%
Vitamin A	7%	Vitamin C	2%
Calcium	20%	Iron	14%
Vitamin D	0%	Vitamin B-6	5%
Vitamin B-12	6%	Magnesium	6%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.



People who work at **Pizza Hut**



People who used to work at **Pizza Hut**



Jobs at **Pizza Hut**



Pizza Hut

Restaurants; 10,001+ employees



Pizza

Restaurants; 1-10 employees



PizzaExpress

Food & Beverages; 5001-10,000 employees



Pizzaiolo

Food & Beverages; 51-200 employees



PizzaRev

Restaurants; 201-500 employees



Mark Pizza

Marketing & Advertising Production | Project Management | Creative Operations | Account Services



JonPaul Pizza

Global Head of Technology and Data Risk Governance at Morgan Stanley



Gabriele Di Piazza · 2nd

Marketing | Product Management | Business Development. Currently SVP Marketing at Guavus



pasta n pizza

CEO at Pizza n Pasta 2



Gianluca Pizzaballa

Chief Brand Advisor at Moonstar Japan



Derek Pizzagoni, MBA, CISM, CISSP-ISSMP

Director of Information Security at Recurly, Inc.

Give WDM Tell Your Story

2 ways to keep in to



Weibo Koi
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Fundrais

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pizza

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139 new results

**KFC** @kfc · Sep 9

Stop what you're doing and gather round. It's time to see what this lucky Colonel got for his 125th birthday!



GIF



47



87



Promoted



Retweeted 258 times

**Forbes** @Forbes · Sep 9

The **pizza** restaurant industry generates \$39 billion in revenue in the US:
onforb.es/1JRth6l



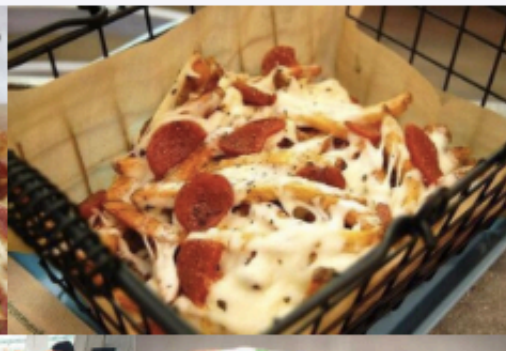
258




165







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Photos







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Search Engines







ons Messages  nepal earthquake 







 **Carolyn Miles** @carolynsave · 6m
@NYTimes today - Uncertainty and Helplessness Become a Way of Life in **Nepal** nyti.ms/1JNC0aT @SavetheChildren there still helping...
  2  1   [View summary](#)

 **The Guardian** @guardian · 16m
 India rescues children from traffickers exploiting **Nepal earthquake** aftermath trib.al/mb8swpF
  49  25   [View summary](#)

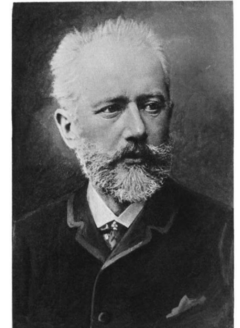
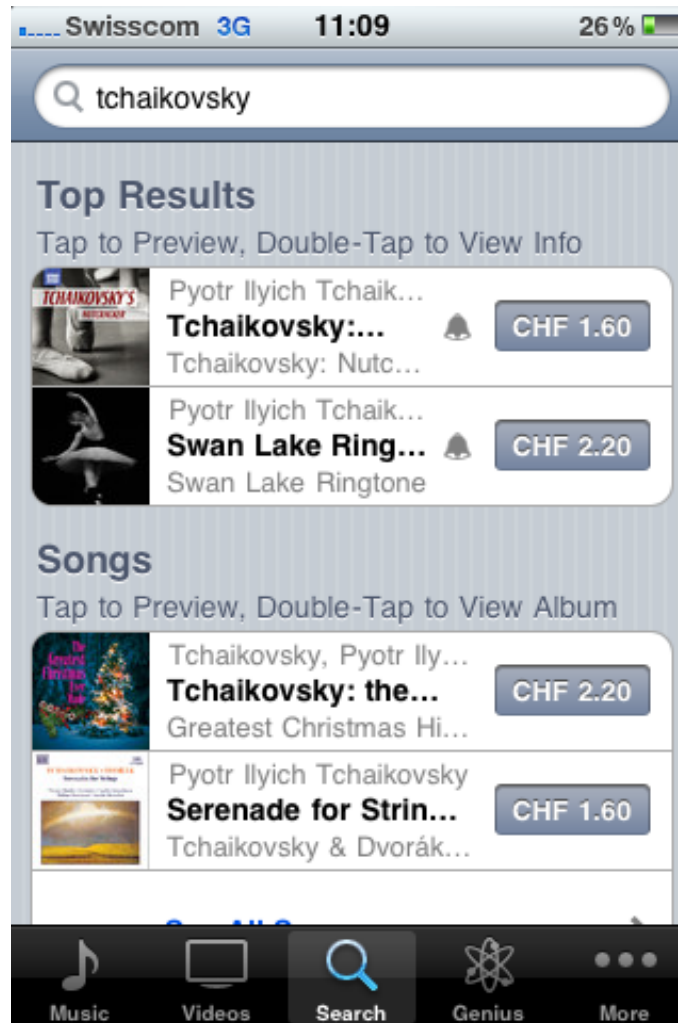
 **World Vision** @WorldVision · 54m
VIDEO It's been one month since #NepalQuake. @WorldVision has reached 45,000+ with relief goods. Thx to our donors ow.ly/NogHX
  16  16  

 **Mellisa B.** @mellberr · 59m
→ buff.ly/1AsFn4U earthquake #earthquake Uncertainty and Helplessness Become a Way of Life in **Nepal** 777 England GBR Sunderland GBR
  59  6  

 **WorldBankSouthAsia** @WorldBankSAsia · 1h
One month after the #NepalEarthquake: Can **Nepal** rebuild and return to normalcy? wrlb.bg/Nock1
  11  10   [View photo](#)

 **New York Times World** @nytimesworld · 2h
The **Nepal**-based writer @tangledjourneys on post-earthquake life and constantly feeling on edge nyti.ms/1Q61zDV
  20  15   [View photo](#)

Search Engines



Goals

- Understand search engines
- Learn their different applications
- Compare them
- Modify their functionality to specific needs
- Introductions to hot topics in IR

Key Topics

- Architecture of a search engine
- Data acquisition and cleaning
- Text processing
- Query formulation
- Ranking, re-ranking
- Performance and evaluation
- Research and applications in IR
- ...

Definition

Information Retrieval (IR) is a field concerned with the structure, analysis, organization, storage, searching, and retrieval of information. (Salton, 1968)

Definition

Information Retrieval (IR): Finding material (usually documents) of an unstructured nature (usually text) that satisfies an information need from within large collections (usually stored on computers). (Manning et al.)

Definition

Information retrieval deals with the *representation, storage, organization* of, and *access* to information items. These information items could be references to real documents, documents themselves or even single paragraphs, as well as web pages, spoken documents, images, pictures, music, video, etc. (Baeza-Yates & Ribeiro-Neto, 1999)

Search and Users

- User needs
 - Browsing
 - Looking for a known item
 - Answers for questions
 - Video, image, location, review, lyrics,...

What is a document?

- Examples:
 - Webpages, email, books, news stories, scholarly papers, Facebook pages and postings, SMS, tweets, Word, PPT, PDF, blogs, forum postings, IM (Viber, Skype, etc.)
- Common properties
 - Text content
 - Some structure (e.g., title, author, date, subject, sender)

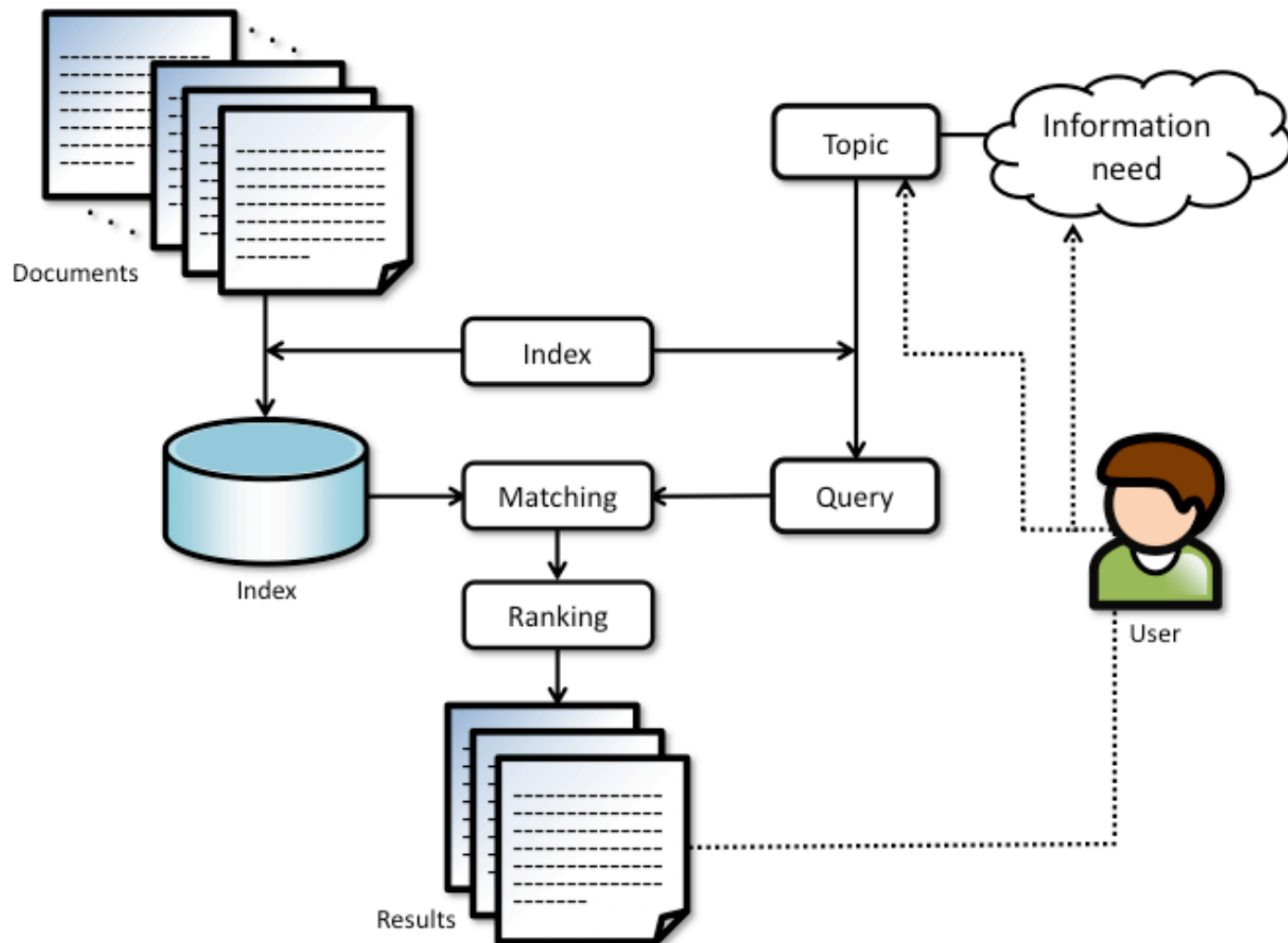
Documents (IR) vs. Records (DB)

	Database	IR
Data	Structured	Unstructured
Fields	Clear semantics (domain)	No fields (other than text)
Model	Deterministic	Probabilistic
Queries	Defined (SQL, relational algebra), complex, complete specification	Free text (NL) flat, Boolean, partial
Access	Primary key	?
Matching	Exact	Best Match (BM)
Recoverability	Critical (concurrency control, recovery, atomic operations)	Downplayed

Search and Users

- User needs
 - Browsing
 - Looking for a known item
 - Answers for questions
 - Video, image, location, review, lyrics,...

The IR Process



Pain



Wikipedia

YAHOO!

pain |

- pain **in lower left abdomen**
- pain **management doctors**
- pain **management**
- pain **under right rib cage**
- pain **and gain**
- pain **behind knee**
- pain **medication list**
- pain **in lower right abdomen**
- pain **on left side of abdomen**
- pain **between shoulder blades**

Search Web

My Yahoo Hi, Nada Mail

- Mail
- News
- Sports
- Finance
- Weather
- Autos
- Fantasy
- Screen
- Dating
- Shopping
- Makers
- Parenting
- Health
- Style
- Beauty

CONGRATULATIONS!
YOU HAVE DISCOVERED A
FREE \$100,000
FANTASY FOOTBALL CONTEST

CLICK TO UNLOCK

Close Ad



- Trending Now
- | | |
|------------------------|---------------------|
| 1 Rob Kardashian | 6 Fantasy football |
| 2 Pauley Perrette | 7 Jessica Biel |
| 3 Jennifer Lawrence | 8 The Walking Dead |
| 4 Kaley Cuoco-Sweeting | 9 WWE Divas |
| 5 Patrick Swayze | 10 June Carter Cash |

YAHOO!

- Mail
- Actualités
- Sport
- Finance
- People
- Style
- Cinéma
- Auto
- Vidéo
- Shopping
- Tech

Autres sites Yahoo >

PagesJaunes
eBay
Amazon

pain

Recherche Web

pain **perdu**
pain **de sucre**
pain **du soir**
pain **de poisson**
pain **d épices**
pain **de thon**
pain **complet**
pain **sans gluten**
pain **surprise**
pain **au chocolat**



g, alors qu'elle était

6-10 sur 30



 Ils cachaient bien leur jeu	 Cabella : provocation ou maladresse ?	 Un héros gay dans Star Wars	 Frayeur pour cet ancien tennisman	 Une tendance juste pour les mamans
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TPMP : gros malaise en plein direct pour Cyril Hanouna

Animer une émission en direct apporte son lot de bonnes comme de mauvaises surprises. Cyril Hanouna en a encore fait les frais hier soir dans Touche pas à mon poste. Non Stop Zapping vous en dit plus.

Non Stop Zapping

Challenges in IR

- Relevance
 - Retrieval models → Ranking
 - Simple statistical approaches work!
- Evaluation
 - Effectiveness: Precision & Recall
 - Test-collections
- Users and Information needs
 - User satisfaction
 - Users know what they want (do they?)
 - Query refinement and reformulation techniques → Ranking

Search Engines and IR

- Search engines are practical applications of IR
- Known open source SE (libraries): Lucene, Indri, Galago
- Challenges in SE = IR Challenges+
 - Performance:
 - Efficient search and indexing
 - Dynamic data
 - Fresh indexes
 - Scalability
 - More data, more users
 - Adaptability
 - Tuning ranking, indexing, and interfaces for applications
 - Specific problems
 - Spam (Web)