

PCTY2012



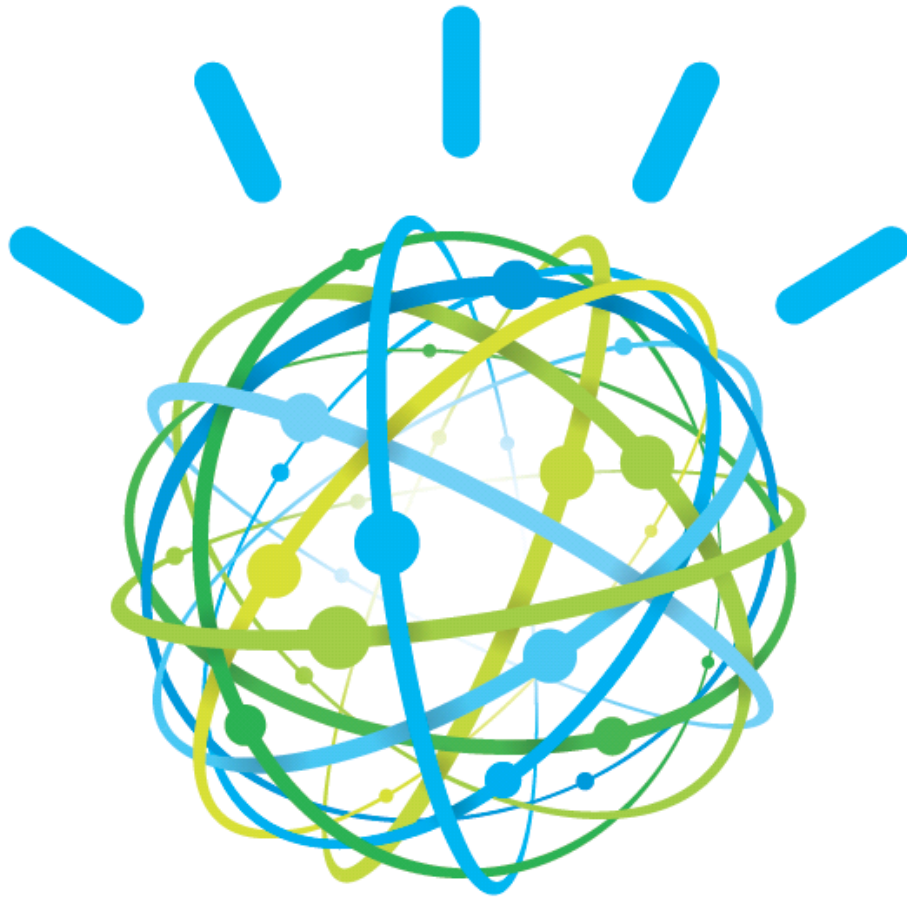
Pulse Comes to You

IBM Watson goes to work
Dale Lane



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PCTY2012 

Optimizing the
World's Infrastructure

Question Answering

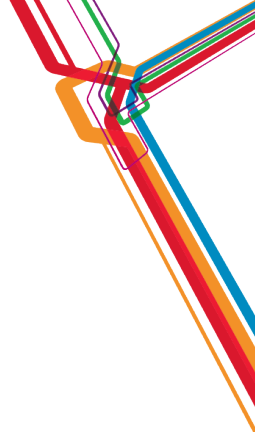
How Watson works

IBM Watson since Jeopardy!

What comes next for Watson?



Understanding the question



In May 1898, Portugal
celebrated the 400th
anniversary of which
explorer's arrival in India?

May 1898, Portugal
celebrated the 400th
anniversary of which
explorer's arrival in **India?**

In May 1898, Portugal celebrated the 400th anniversary of which explorer's arrival in India?

May **Portugal**
celebrated **arrival in**
anniversary **India**
explorer

In May, Gary arrived in India after he celebrated his anniversary in Portugal.

In May 1898, Portugal celebrated the 400th anniversary of which explorer's arrival in India?

May **Portugal**
celebrated **arrival in**
anniversary **India**
explorer

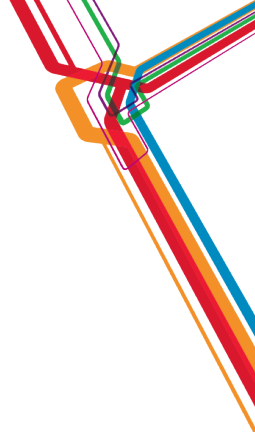
On the 27th of May 1498, Vasco de Gama landed on Kappad Beach

Which loyal companion
first appeared in the same
year the object he shares a
name with was discovered?

Building knowledge



Where was Einstein born?



Where was Einstein born?

| Name of physicist | Birth place |
|-------------------|-------------|
| Marie Curie | Warsaw |
| Albert Einstein | Ulm |
| Niels Bohr | Copenhagen |

Where was Einstein born?

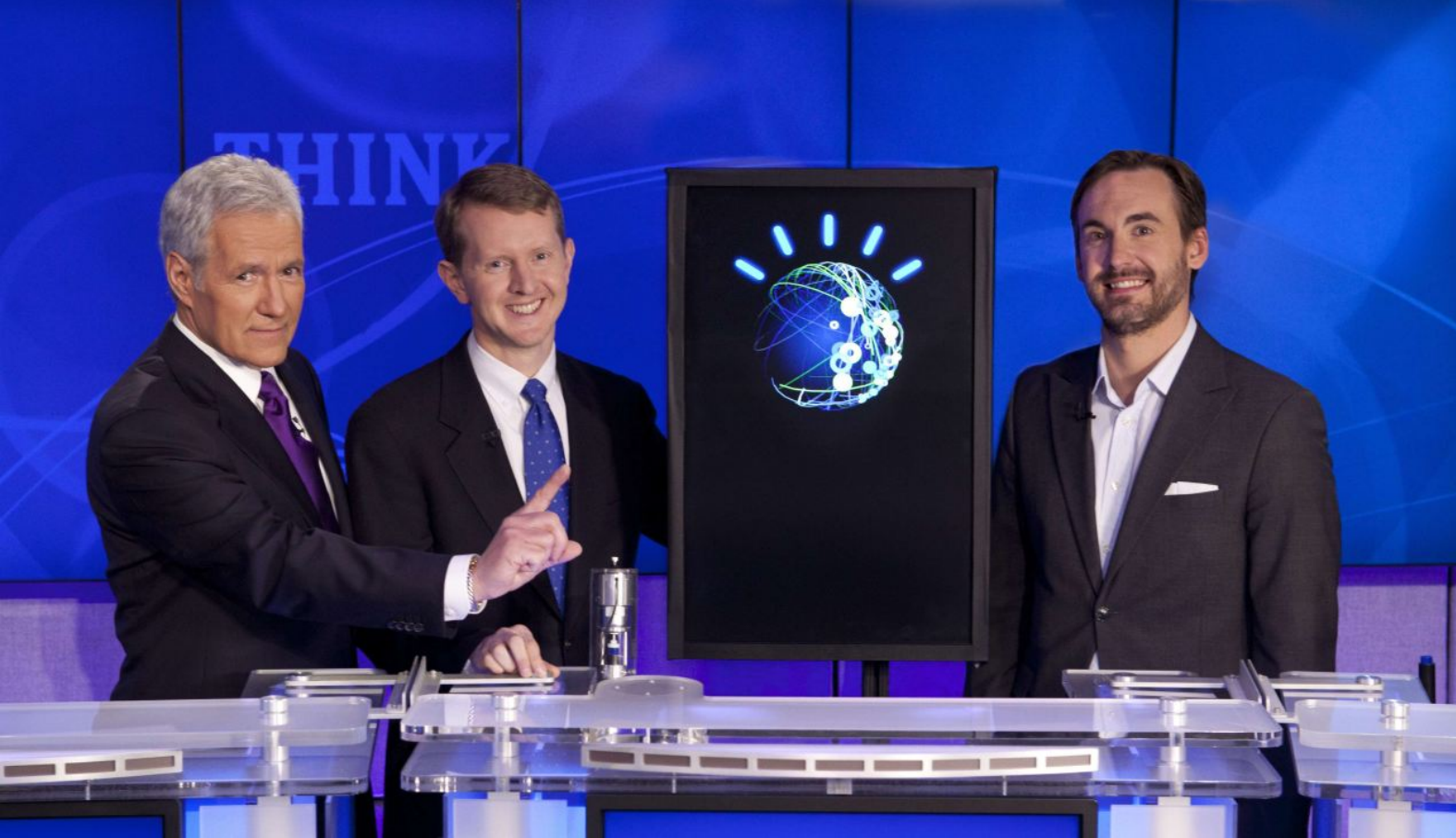
“... One day, from among his city views of Ulm, Otto chose a water color to send to Albert Einstein as a remembrance of Einstein's birthplace ...”

The image features the word "JEOPARDY!" in large, 3D, metallic gold letters. The letters are set against a blue background with a grid pattern that recedes into the distance, creating a sense of depth. The lighting on the letters is bright, highlighting their metallic texture.

JEOPARDY!

PCTY2012 

Optimizing the
World's Infrastructure



IT'S JUST
A BLOODY NOSE!
YOU DON'T HAVE
THIS HEREDITARY
DISORDER
ONCE ENDEMIC TO
EUROPEAN ROYALTY







Question Answering

How Watson works

IBM Watson since Jeopardy!

What comes next for Watson?



Building
knowledge

Answering
questions



Building
knowledge



How is it different to ... ?



Siri



how long is the day on mars

www.wolframalpha.com/input/?i=how%20long%20is%20the%20day%20on%20mars

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A WOLFRAM WEB RESOURCE

WolframAlpha computational knowledge engine

how long is the day on mars

Examples Random

Input interpretation:
Mars solar day

Result:
1 day 0 hours 39 minutes 35.2429 seconds

Unit conversions:
1 day 39 minutes 35.2429 seconds
24 hours 39 minutes 35.2429 seconds

Comparison as time:
 $\approx 3.1 \times 8\text{-hour workday (8 hr)}$

Corresponding quantities:
Distance x traveled by light in a vacuum from $x = ct$:
16.54 billion miles
 2.661×10^{10} km (kilometers)
 2.661×10^{13} meters
178 AU (astronomical units)

Working time:
5.9 hours
0.24 days
(assuming a 40-hour work week)

Frequency ν from $\nu = 1/T$:
 1.1×10^{-5} Hz (hertz)

Computed by Wolfram Mathematica Source information Download as: PDF Live Mathematica

Every smart device needs a knowledge app...

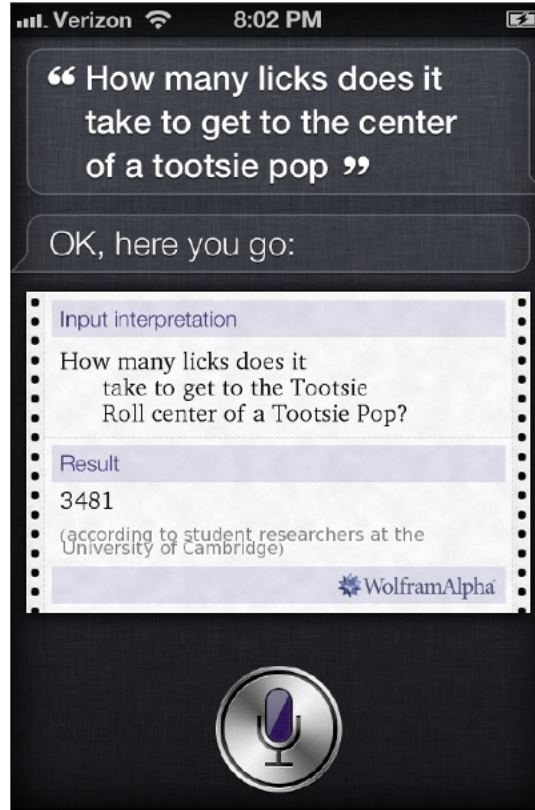
Get the Wolfram|Alpha App »

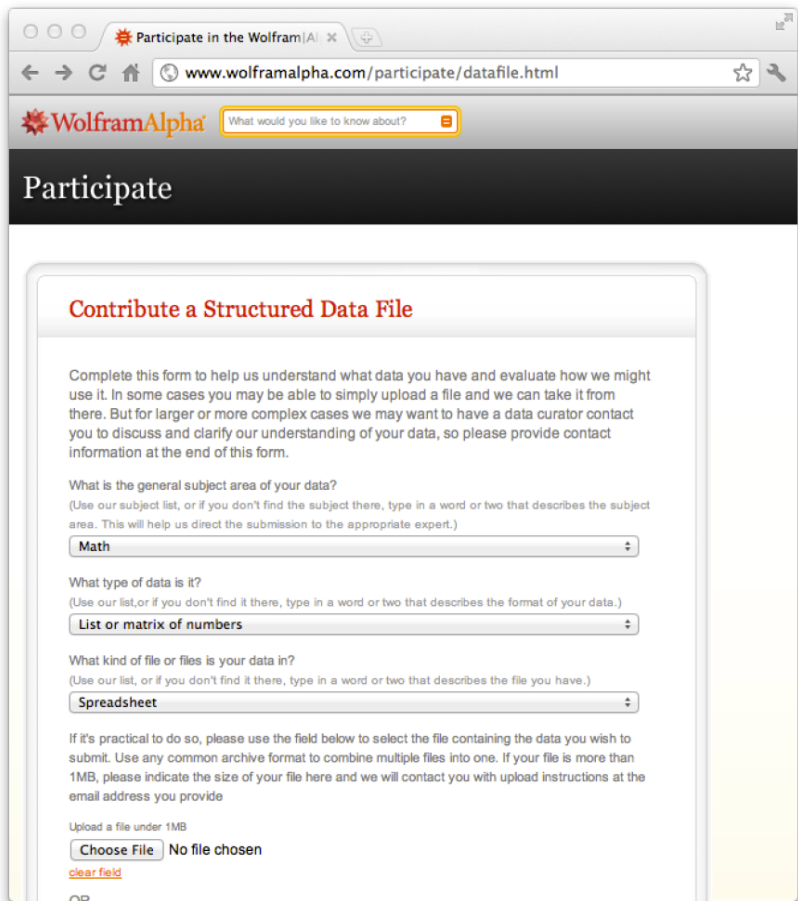
Related Wolfram|Alpha Queries

- (solar day of Mars)/(orbital...
- solar day of Mars vs Uranus
- solar day of Earth

Related Links

- Mars





Participate in the Wolfram|Alpha

www.wolframalpha.com/participate/datafile.html

WolframAlpha What would you like to know about?

Participate

Contribute a Structured Data File

Complete this form to help us understand what data you have and evaluate how we might use it. In some cases you may be able to simply upload a file and we can take it from there. But for larger or more complex cases we may want to have a data curator contact you to discuss and clarify our understanding of your data, so please provide contact information at the end of this form.

What is the general subject area of your data?
(Use our subject list, or if you don't find the subject there, type in a word or two that describes the subject area. This will help us direct the submission to the appropriate expert.)

Math

What type of data is it?
(Use our list, or if you don't find it there, type in a word or two that describes the format of your data.)

List or matrix of numbers

What kind of file or files is your data in?
(Use our list, or if you don't find it there, type in a word or two that describes the file you have.)

Spreadsheet

If it's practical to do so, please use the field below to select the file containing the data you wish to submit. Use any common archive format to combine multiple files into one. If your file is more than 1MB, please indicate the size of your file here and we will contact you with upload instructions at the email address you provide

Upload a file under 1MB

Choose File No file chosen

[clear field](#)



Wikipedia

Time Magazine

Oxford English Dictionary

Project Gutenberg books

New York Times

Encarta

IMDB

Complete works of Shakespeare



Answering
questions

How is it different to ... ?

Google

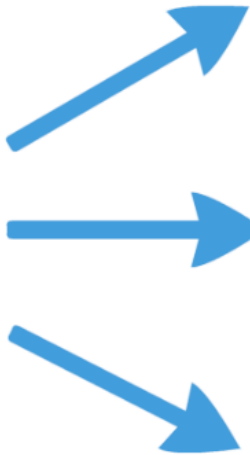
In May 1898, Portugal celebrated the 400th anniversary of which explorer's arrival in India?

| | |
|--------------------|-------------------|
| May | Portugal |
| celebrated | arrival in |
| anniversary | India |
| explorer | |

On the 27th of May 1498, Vasco de Gama landed on Kappad Beach

Question

Which US President was assassinated in Dallas in the 1960's?



Interpretation 1



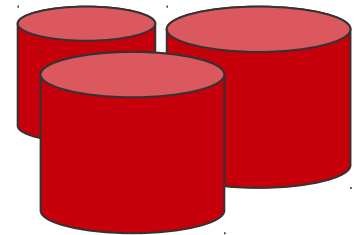
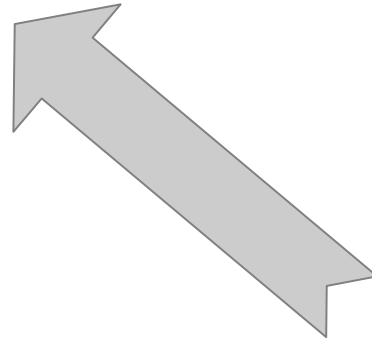
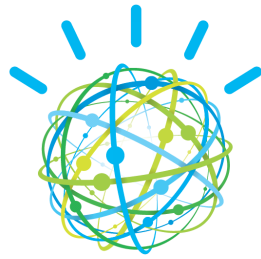
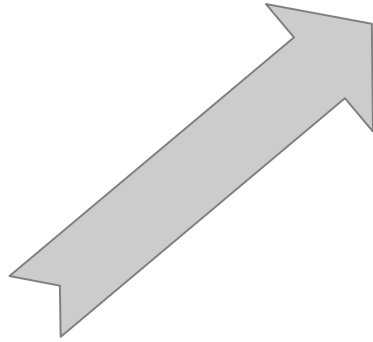
Interpretation 2

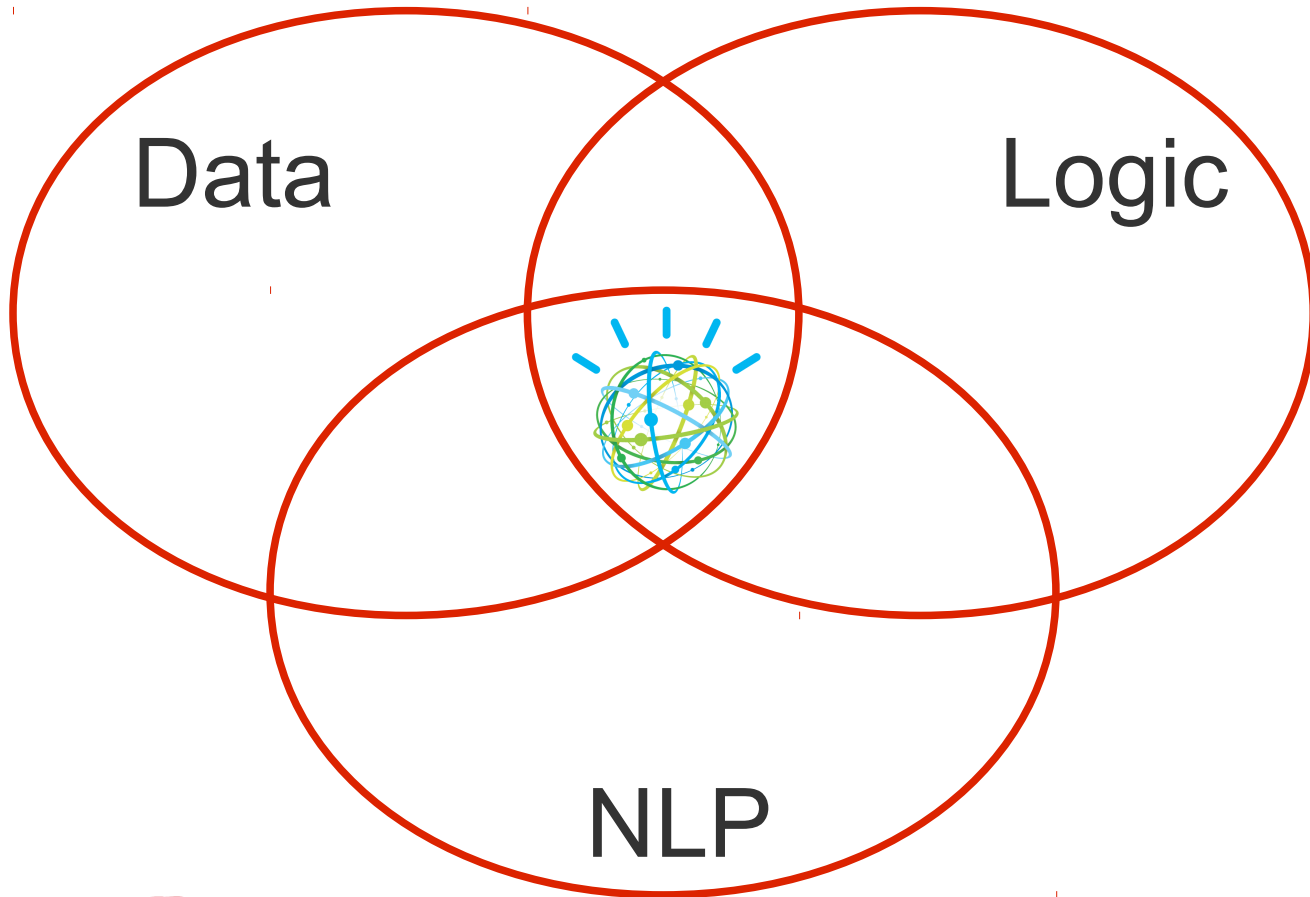


Interpretation 3



- Possible answer 87%
- Possible answer 34%
- Possible answer 23%
- ...







Question Answering

How Watson works

IBM Watson since Jeopardy!

What comes next for Watson?

IBM
Research
Project
(2006–)

Jeopardy!
Grand
Challenge
(Feb 2011)

Watson
for
Healthcare
(Aug 2011–)

Watson
for Financial
Services
(Mar 2012–)

Watson
Industry
Solutions
(2012–)



R&D



Demonstration



Commercialization



Expansion




Cross-industry
Applications

Watson since Jeopardy!



**YOU JUST NEED
A NAP! YOU DON'T
HAVE THIS
SLEEP DISORDER
THAT CAN MAKE
SUFFERERS NOD OFF
WHILE STANDING UP**



A large, multi-story library with high ceilings and skylights. Bookshelves line the walls, and several people are seated at tables, studying or reading. The scene is well-lit by natural light from the skylights and artificial lights.

medical
textbooks

studies

research
papers

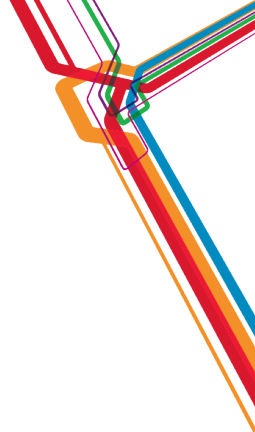
journals

trials

treatment
guidelines

medical
records

observations

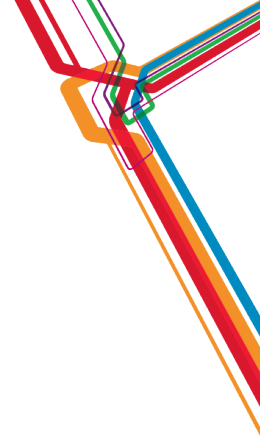


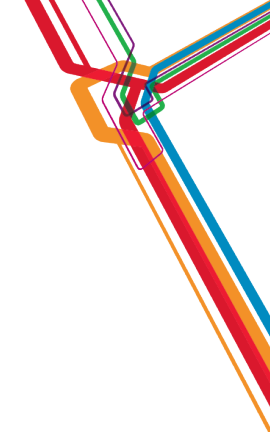
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PCTY2012 

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<http://youtu.be/NByCczOfN4k>

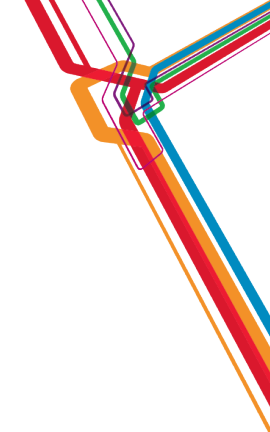


WELLPOINTSM

One of the largest health benefits companies in the United States

Together with its subsidiaries, serves more than 65 million people

One in nine Americans receives coverage for their medical care through WellPoint



<http://youtu.be/1AQ9CxWo7o0>

IBM Watson pilots with WellPoint

Clinical decision support tool for use by WellPoint's Registered Nurses responsible for managing complex patient cases and reviewing treatment requests from medical providers

IBM Watson pilots with WellPoint

Trialling use in oncology practices to support the evidence-based diagnosis, treatment, and coordination of care of cancer patients



Tom Groenfeldt, Contributor
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TECH | 2/01/2012 @ 2:19PM | 3,596 views

IBM's Watson, Cedars-Sinai and WellPoint Take On Cancer

+ Comment now

[WellPoint](#) and [IBM](#) are working with oncology experts at the Cedars Sinai Cancer Institute in [Los Angeles](#) to educate Watson as a physician's assistant. Watson, an IBM computing system proved on *Jeopardy!* that a computer can collect and understand vast amounts of information and provide answers.

That was fine for a game show — now Watson is being put to work digesting millions of pages of research, incorporating the best clinical practices and monitoring the outcomes to assist physicians in treating cancer patients.

“This is an opportunity to use supercomputing powers to bring vast amounts of data to the practicing physicians while making it understandable,” said Dr. Harlan Levine, executive vice president for comprehensive health solutions at WellPoint, the health benefits company. Watson can assimilate two million pages of information every three seconds.

WellPoint and IBM agreed to start with oncology because it is so complex and has so many opportunities to use supercomputing to improve the quality and consistency of health care.

Most Popular



Tom Groenfeldt
Contributor
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I write about finance and technology, which can range from supercomputers to iPhones and iPads, which have made inroads into enterprise computing in the last year. It's a fast-moving world with just a bit of hype, so figuring out what's real is a challenge, and spotting emerging trends is a feat that often comes from listening and deciphering

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The author is a Forbes contributor. The opinions expressed are those of the writer.

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Question Answering

How Watson works

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Understanding complex scenarios

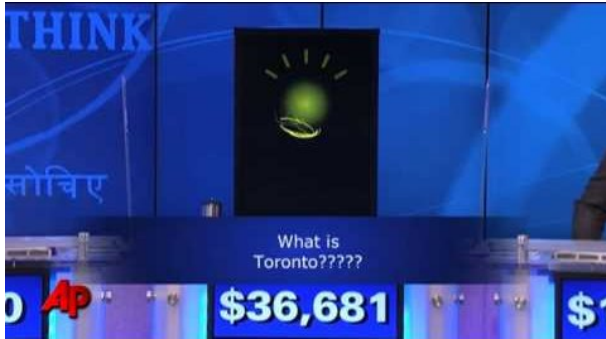
YOU JUST NEED
A LITTLE MORE SUN!
YOU DON'T HAVE
THIS HEREDITARY
LACK OF PIGMENT

The screenshot displays a web-based interface for a "Longitudinal Patient Record". At the top, it shows patient details for John Anderson, MRN: 040103110830840, Age: 48. Below this is a navigation menu with options like Summary, Encounters, Conditions, Allergies, Medications, Laboratory, Pathology, Immunizations, Imaging, Procedures, Documents, and Clinical Summary. The "Imaging" section is active, showing search filters for From Date (01/05/2007), To Date (01/05/2012), and Units. A list of imaging studies is shown on the left, including CT, Plain Films, X-Ray Chest, X-Ray Abdomen, and Ultrasound. The main content area displays a "Chest X-Ray Report" for a portable study performed on 01/05/2012 by Dr. Joanne Cameron. The report is electronically signed and includes a "Display Image" link. Below the report is an "Imaging Details" table.

| Imaging Details | |
|-----------------|---|
| Ordered by | Dr. Joanne Cameron |
| Indication | X-Ray for suspicion of pulmonary embolism |
| Status | Signed |

The interface footer includes the user name "Joanne Cameron", a "Sign out" link, and navigation icons for "Diagnosis & Treatment", "Authorizations", and "Patient SPR". The IBM Watson logo is visible in the bottom right corner.

Interactive question dialog



Illness: Patient has a confirmed case of uveitis
Family History: Patient reports a family history of arthritis
Observations: A circular rash is observed. Patient complains of fever and headache
Environmental: Patient lives in Connecticut

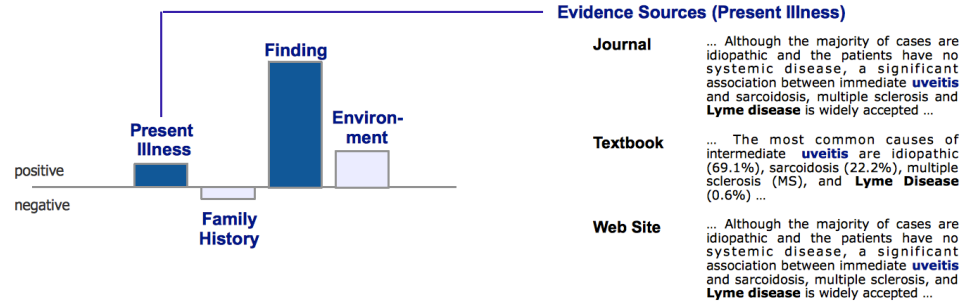
> What antibiotics are prescribed for treating Lyme Disease?

<
Doxycycline - 97%
Amoxicillin - 68%
Ceftriaxone - 30%
Cefuroxime - 29%
Tetracycline - 29%

Evidence profiles explaining answers



- Illness:** Patient has a confirmed case of uveitis
- Family History:** Patient reports a family history of arthritis
- Observations:** A circular rash is observed. Patient complains of fever and headache



Continuous incremental ingestion



One user

One question at a time

Stand-alone stateless questions

Priority is accuracy of the top answer

Training on new content

Returns answers

Text-only input

Broad, shallow content

No security

Multiple users

Multiple concurrent questions

Stateful dialog with multiple questions

Priority is accuracy of top answers

Incremental ingestion, training, learning

Returns answers, evidence & suggestions

Text, tables and images as input

Deep, industry-specific content

High security configurations

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