Crowdsourced Query Understanding and Optimization

Joachim Hugonot (team leader), François Farquet (speaker), Florian Chlan, Xinyi Guo, Simon Rodriguez, Kristof Szabo, Florian Vessaz, Vincent Zellweger

Supervisor : Immanuel Trummer

Motivation : Limitations of databases

- Join pictures showing the same person.
- Answer natural language queries.
- Retrieve data from unstructured data sources (i.e. internet).

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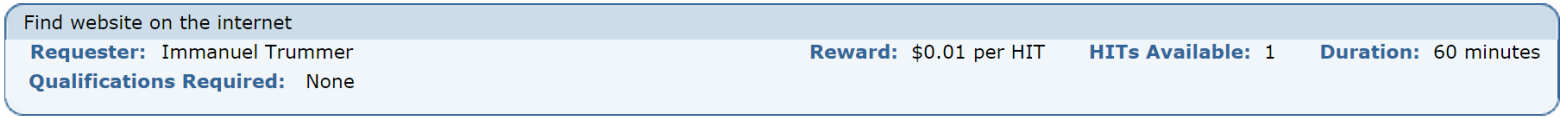
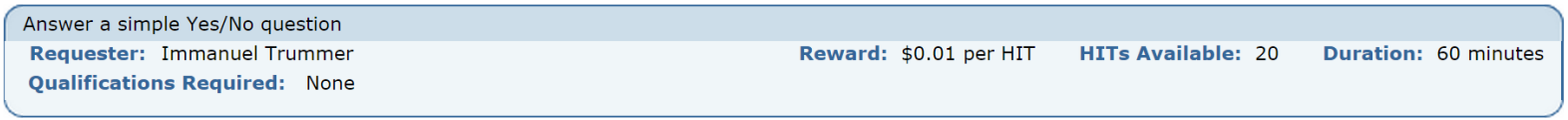
- Solution : use **human workers**.

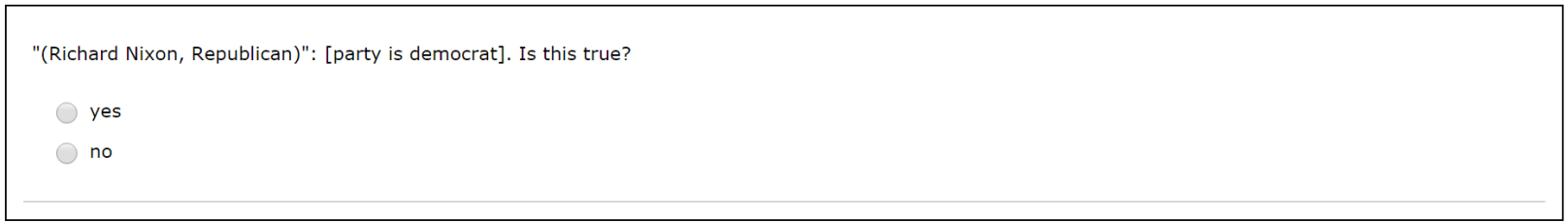
Crowdsourcing

- What is crowdsourcing ?
  - Requesters **pay human workers** to do simple tasks.
- Biggest platform : Amazon Mechanical Turk.
  - Thousands of workers.
  - Typical tasks for 0.01$ to 0.1$.

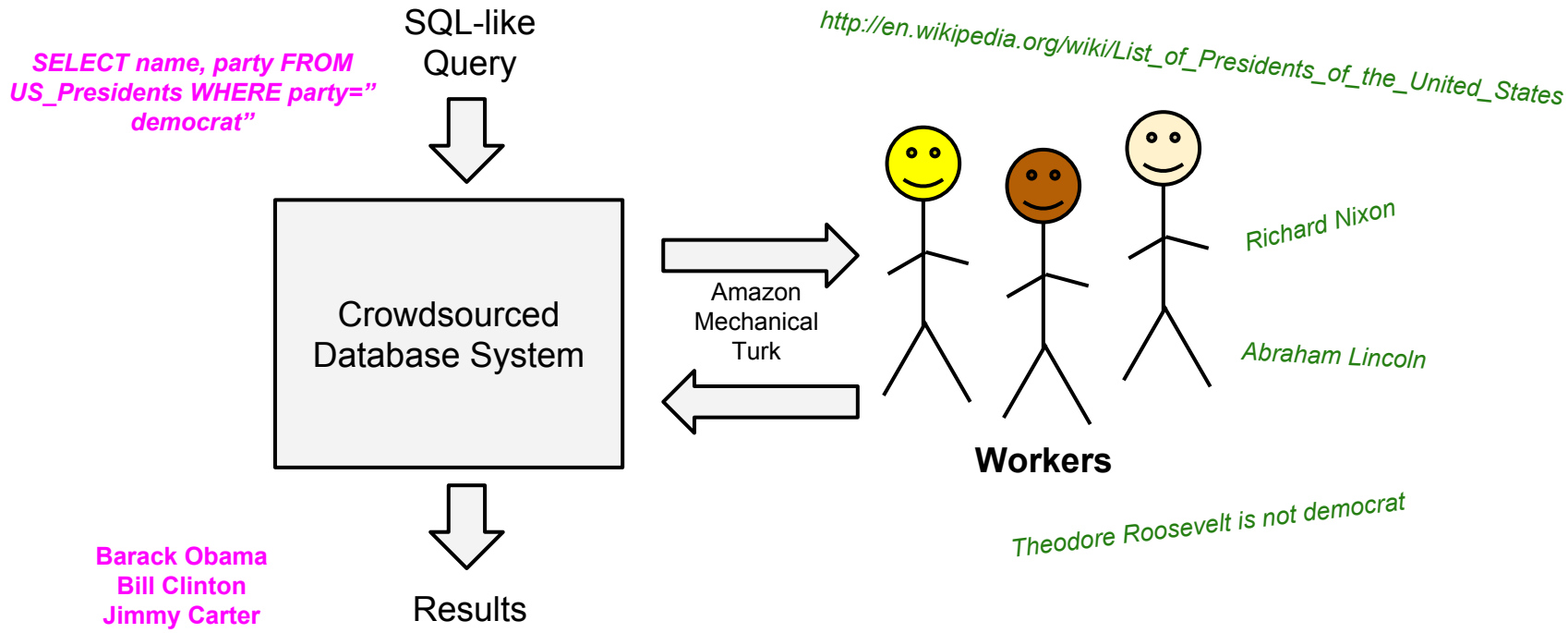
Amazon Mechanical Turk







Crowdsourced database system



Example Query

(SELECT (name, political party) FROM [Presidents of USA]) WHERE [party is democrat]

- *attributes*
- *Data source*
- *Predicate*

Additionally supported crowd-operators :

- JOIN
- GROUP BY
- ORDER BY

Query tree

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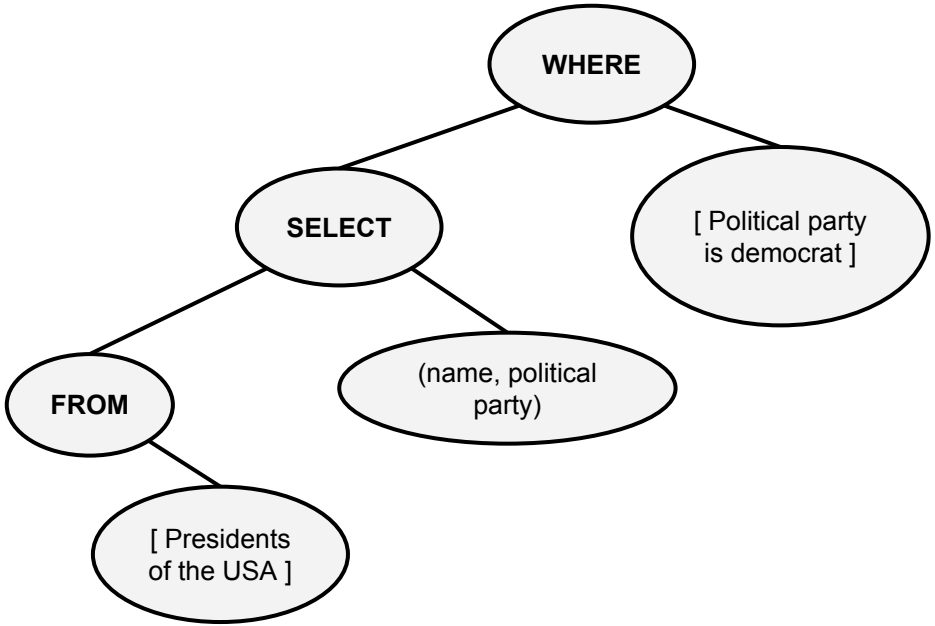

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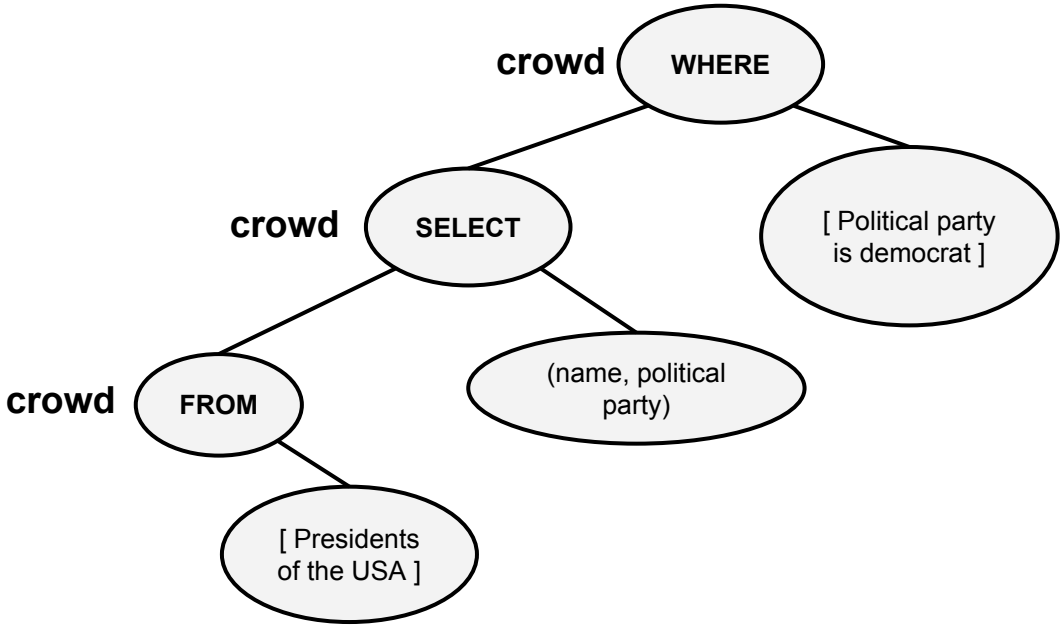

Live demo

- We build a software (in Java/Scala) that runs on a server.

- The core parts are :
  - The parser for our SQL-like language
  - API and communication with *Amazon Mechanical Turk* service
  - Query execution strategy, parallelization and pipelining.
  - Operators implementation (select, where, join, group by, order by)
  - Web interface for simple and assisted usage

Conclusions

- Fun and trending topic !

- Endless future work :
  - Query language enhancement
  - different algorithms implementations (JOIN, GROUP BY, ...)
  - results analytics (price, time, accuracy)
  - …

- We thank Immanuel Trummer for his suggestions and comments !