

# Discrete Information Retrieval

**Search over Structured and Unstructured  
Data with LLMs**

Search.

Understanding  
implicit text  
regularity.

# What non-black 15 liter bag under \$400 do you have?

```
{  
  "title": "Wildcraft Toss 39 Ltrs Black & Red Backpack",  
  "price": 1080,  
  "uri":  
    "https://www.bigco.com/MP001000011879890",  
  "product_id": "8903338115243-Wildcraft",  
  "description": "Bag Type : Backpacks, Capacity : 39litres, Closure Type : Zip, Collection Name : Toss, Color : Black & Red, Height : 15cm, Length : 47cm, Material Type : Polyester, No of Compartments : 2, Size : Medium, Strap Type : Adjustable, Width : 33cm, styleNote: Add a quotient of style to your casual attire by carrying this unisex from Wildcraft. It is fashioned from premium quality polyester and is sure to last for a long time. This backpack with a color block pattern flaunts spacious compartments that can accommodate your valuables easily. This black and red backpack comes with an adjustable strap and a zip closure that makes sure your essentials are safe and secure.",  
  "brand": "Wildcraft"}  
}
```

# Consider Dense Information Retrieval

Approximate Nearest Neighbors  
Does not Understand  
Implicit Text Regularity

Has Low Query Recall.

Also Low Query Precision for  
exacting queries.

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# Enter Discrete Information Retrieval

Higher Recall and Precision,  
by Understanding  
Implicit Text Regularity

Like **SUQL**:

- Optimizable **Discretize** generates SQL DB fields
- Optimizable **ENUM**
- **Semantic Parsing** translates natural language into SQL

Unlike **SUQL**:

- A data pipeline rather than a query language
  - No dense IR (i.e. **ColBERT**)
  - External **Answer** explicitly  
**Reinforcement Learns ReAct**
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What non-black  
15 liter bag under  
\$400 do you  
have?

#### Dialogue State

```
{"product_capacity = '15 liters' AND  
product_color != 'black' AND price < 400",  
  "product_capacity = '15 ltrs' AND  
product_color != 'black' AND price < 400",  
  "product_size = '15 ltrs' AND product_color  
!= 'black' AND price < 400"}
```

#### Answer

```
{'id': 'TPZEUSHBLU-Aristocrat',  
'price': 324.0,  
'title': 'Aristocrat 15 Ltrs Blue Small Bag',  
'closure_type': 'zip',  
'height': '48',  
'length': '31',  
'material_type': 'polyester',  
'product_brand': 'aristocrat',  
'product_capacity': '15 ltrs',  
'product_collection': 'zeus',  
'product_color': 'blue',  
'product_size': 'small',  
'product_type': 'backpack',  
'strap_type': 'adjustable',  
'width': '15.5'}
```

# Thank you!

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