



Plants

PRI - Information Processing and Retrieval (2023/2024)

T01G15

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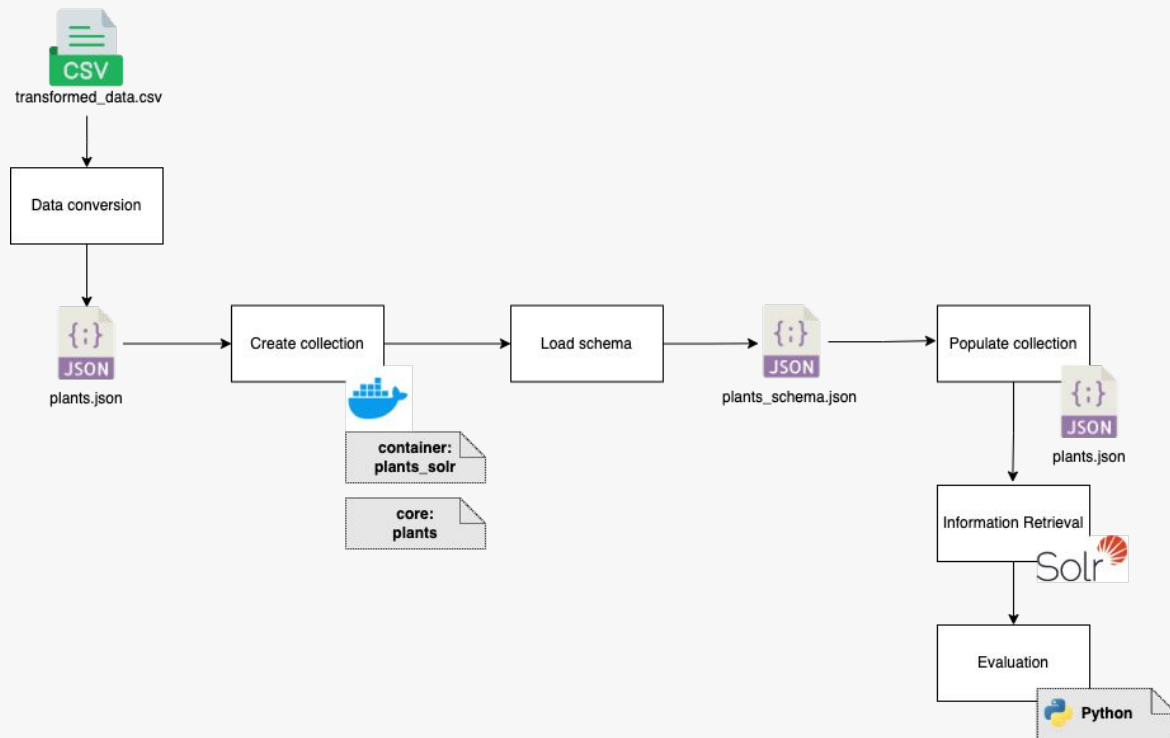
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INTRODUCTION

Process



Indexing

Custom field types:
text + commaSep

Field	Type	Indexed
Introduction	text	Yes
Description	text	Yes
OriginCountry	commaSep	Yes
Characteristics	text	Yes
Habitat	text	Yes
Taxonomy	text	Yes
Ecology	text	Yes
Etymology	text	Yes
Genetics	text	Yes

Field	Type	Indexed
Medicine	text	Yes
Nutrition	text	Yes
ChemistryComposition	text	Yes
Toxicity	text	Yes
Allergenicity	text	Yes
Uses	text	Yes
CulinaryUses	text	Yes
Cultivation	text	Yes
ThreatsControl	text	Yes

Indexing

Default Solr field type:
string

Field	Type	Indexed
Name	string	Yes
Division	string	Yes
Class	string	Yes
Clade	string	Yes
Order	string	Yes
Tribe	string	Yes
Family	string	Yes
Genus	string	Yes
Species	string	Yes

Field	Type	Indexed
Kingdom	string	No
Clade_2	string	No
Clade_3	string	No
Clade_4	string	No
Clade_5	string	No
Subtribe	string	No
Subfamily	string	No
Subgenus	string	No

Schema - Custom Field Types

Name	Tokenizer	Filter
text	StandardTokenizerFactory	ASCIIFoldingFilterFactory
		LowerCaseFilterFactory
		SynonymGraphFilterFactory
		FlattenGraphFilterFactory
		PorterStemFilterFactory
		RemoveDuplicatesTokenFilterFactory
commaSep	PatternTokenizerFactory	ASCIIFoldingFilterFactory
		LowerCaseFilterFactory

Systems

Schemaless

- No schema was loaded

Basic System

- 1 query field
- No boosting

Enhanced System

- Added more query fields
- With boosting
 - Field Boosts
 - Term Boosts
 - Proximity Searches

Information Retrieval

Search Task #1:



Which plants can survive in cold environments?

SIMPLE

q:	"low temperature" "benefic cold" "tolerant cold" "remains cold"
qf:	Introduction Description Characteristics Ecology
q.op	OR

BOOSTED

q:	"low temperature"~3 "benefic cold"~3 "tolerant cold"~3 "remains cold"~3
qf:	Introduction^2 Description^3 Characteristics Ecology^0.7
q.op	OR

Information Retrieval

Search Task #2:



Which plants have purple flowers?

SIMPLE

q:	purple flower species
qf:	Introduction Description Characteristics
q.op	AND

BOOSTED

q:	"purple flowers"~5 species purple^5
qf:	Introduction Description^3 Characteristics
q.op	AND

Information Retrieval

Search Task #3:



Which plants are trees and have edible fruits?

SIMPLE

q:	fruit trees edible
qf:	Introduction Description Characteristics
q.op	AND

BOOSTED

q:	fruit^5 trees edible^2
qf:	Introduction Description^2 Characteristics
q.op	AND

Information Retrieval

Search Task #4:



Which plants can be used as Christmas decorations?

SIMPLE

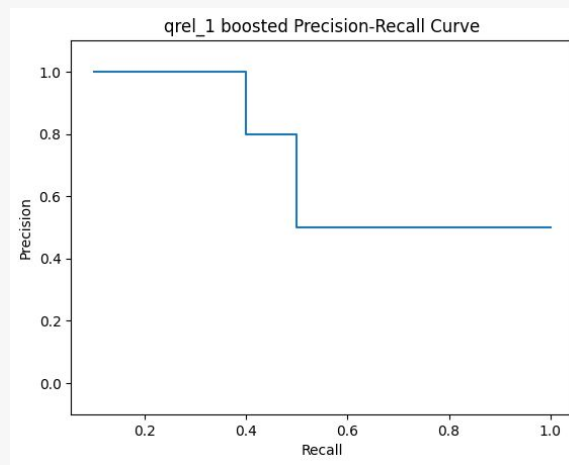
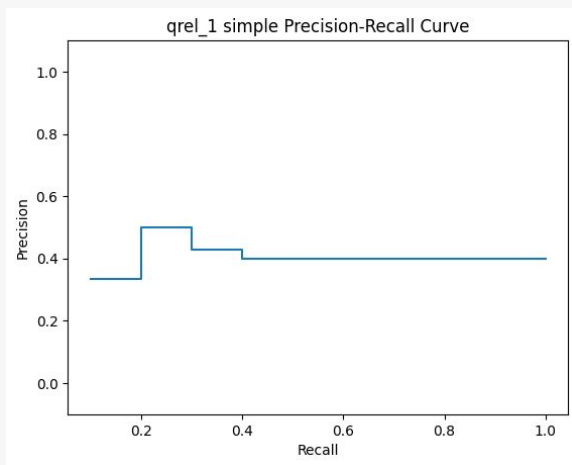
q:	christmas celebration season decoration ornamental
qf:	Introduction Description Etymology
q.op	OR

BOOSTED

q:	("Christmas celebration"~2)^10 ("Christmas decoration"~2)^10 ("Christmas season"~2)^10 tradition ornamental
qf:	Introduction Description Etymology
q.op	OR

Evaluation

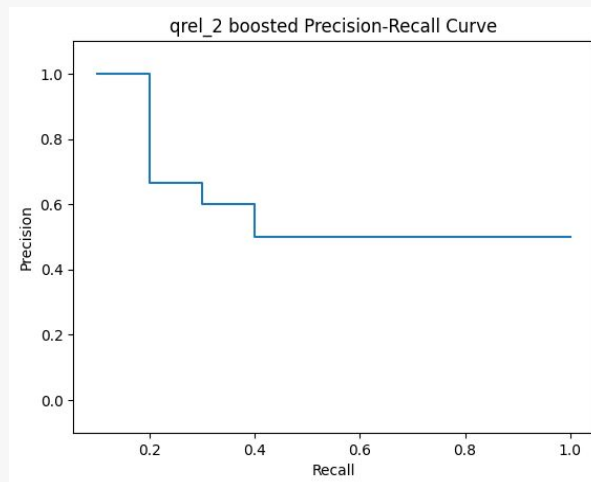
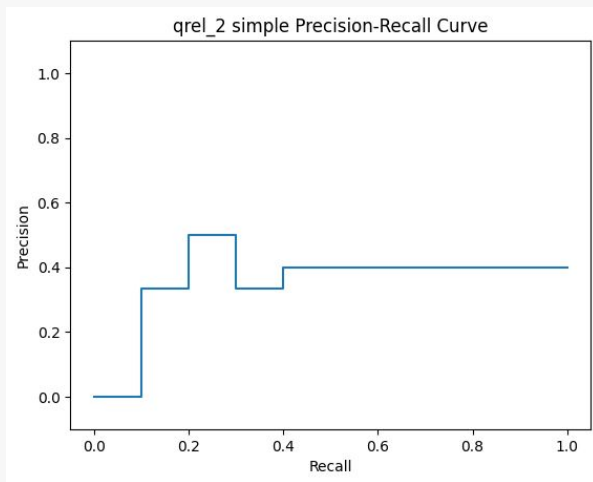
Query 1: Which plants can survive in cold environments?



	Base System	Enhanced System
Average precision	0.650000	0.966667
P@10	0.400000	0.500000

Evaluation

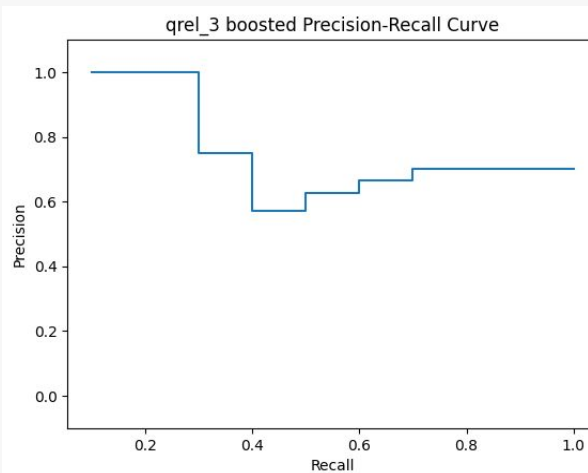
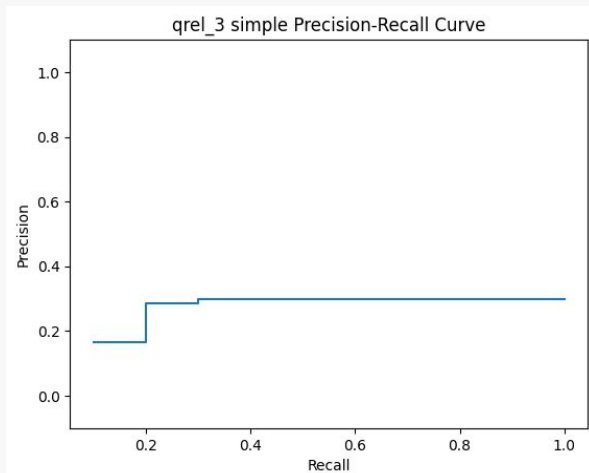
Query 2: Which plants have purple flowers?



	Base System	Enhanced System
Average precision	0.458333	0.794444
P@10	0.400000	0.500000

Evaluation

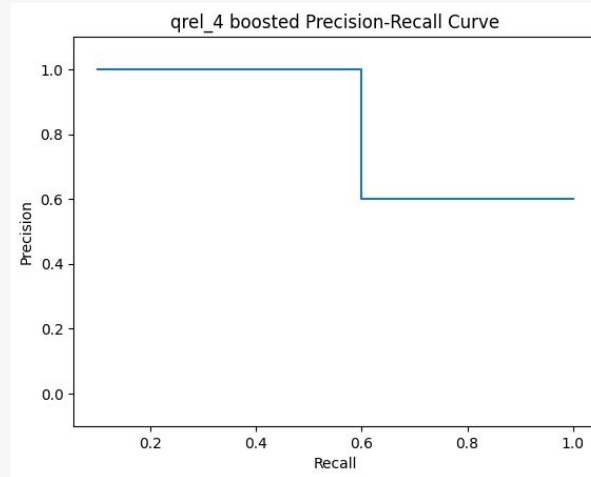
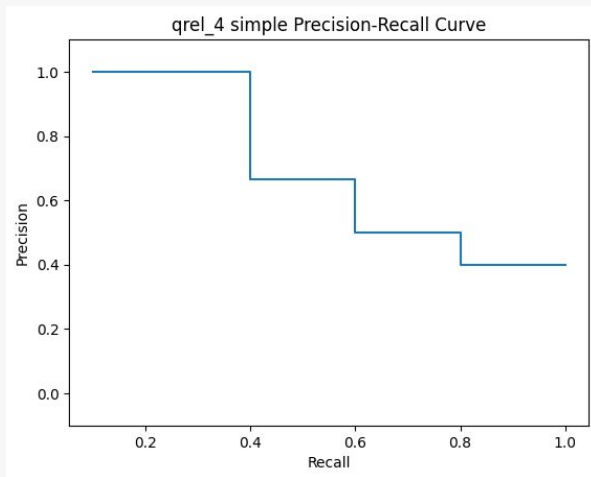
Query 3: Which plants are trees and have edible fruits?



	Base System	Enhanced System
Average precision	0.553571	0.827381
P@10	0.300000	0.700000

Evaluation

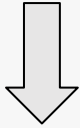
Query 4: Which plants can be used as Christmas decorations?



	Base System	Enhanced System
Average precision	0.830357	1.000000
P@5	0.400000	0.300000

Evaluation

Schemaless



**Mean Average
Precision**

0.00

Base System



**Mean Average
Precision**

0.62

Enhanced System



**Mean Average
Precision**

0.90



CONCLUSIONS

Future Work

Milestone #3



**Improve M2 based on
this milestone's
feedback**



**Semantic search with
the use of embeddings**



**Incorporate new
information retrieval
algorithms**



**Create frontend for the
search system**

Thank You !

T01G15

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