IFN647 ASSIGNMENT 2

Final Report

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# Statement of completeness

|  |  |  |
| --- | --- | --- |
| **Statement of completeness:**  **Group Number:** | | |
| The following undersigned members of the group agree to abide by this statement to ensure successful completion of the project (Assignment 2) to meet project requirements and timelines. We declare that each team member has a same or similar contribution to the project. | | |
| **Name, student number & email** | **Signature** | **Date** |
| 1. ***Priya Gunda, N11362189,*** [***n11362189@qut.edu.au***](mailto:n11362189@qut.edu.au) | *Priya Gunda* |  |
|  |  |  |
|  |  |  |
| 1. Only if permitted |  |  |
| ***Task Allocation for each student***   1. *Creating GitHub Repository, Project folder structure, Task 1*   *2.*  *3.* | ***Allocation Percentage* (%)** | |
| ***Other issues or comments*** | | |

# User Manual

## Information on used packages

## Data folder setup

## How to execute Python files

## Expected outputs for each Python file

## Additional information (if any)

# Design

**Task 1:** Design a BM25-based IR model (***BM25***) that ranks documents in each data collection using the corresponding topic (query) for all 50 data collections.

### Description of your model for Task 1

### Assumption (if any)

### Algorithms (including inputs, outputs, and any other parameters)

**Task 2:** Design a Jelinek-Mercer based Language Model (***JM\_LM***) that ranks documents in each data collection using the corresponding topic (query) for all 50 data collections.

### Description of your model for Task 2

### Assumption (if any)

### Algorithms (including inputs, outputs, and any other parameters)

**Task 3.** Based on the knowledge you gained from this unit, design a pseudo-relevance model (***My\_PRM***) to rank documents in each data collection using the corresponding topic (query) for all 50 data collections.

### Description of your model for Task 3

### Assumption (if any)

### Algorithms (including inputs, outputs, and any other parameters)

# Implementation

**Task 4.** Use Python to implement three models: ***BM25***, ***JM\_LM*** and ***My\_PRM***, and test them on the given 50 data collections for the corresponding 50 queries (topics).

## Model1:

* Python package or module (or any open-source software) you used:

## Data structures (used to represent a single document and a set of documents):

## Model2:

* Python package or module (or any open-source software) you used:

## Data structures (used to represent a single document and a set of documents):

## Model3:

* Python package or module (or any open-source software) you used:

## Data structures (used to represent a single document and a set of documents):

# Results & Evaluation

**Task 5.** Use three effectiveness measures to evaluate the three models.

Table 1: The performance of 3 models on average precison (MAP)

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **Model1** | **Model2** | **Model3** |
| R101 |  |  |  |
| R102 |  |  |  |
| R103 |  |  |  |
| … |  |  |  |
| R150 |  |  |  |
| MAP |  |  |  |

Table 2: The performance of 3 models on precision@10

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **Model1** | **Model2** | **Model3** |
| R101 |  |  |  |
| R102 |  |  |  |
| R103 |  |  |  |
| … |  |  |  |
| R150 |  |  |  |
| Average |  |  |  |

Table 3: The performance of 3 models on DCG10

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **Model1** | **Model2** | **Model3** |
| R101 |  |  |  |
| R102 |  |  |  |
| R103 |  |  |  |
| … |  |  |  |
| R150 |  |  |  |
| Average |  |  |  |

# Discussion

**Task 6.** Recommend a model based on significance test and your analysis.

## Analysis about the difference between three models (Significance test)

## Analysis about your findings and/or Recommendation (A justification must be included on your findings or recommendation)

# References

Appendix 1 (listing the top-15 documents for all queries for Model1)

Appendix 2 (listing the top-15 documents for all queries for Model2)

Appendix 3 (listing the top-15 documents for all queries for Model3)