**Homework 5**

# Introduction

## Collaboration and Originality

1. Did you receive help of any kind from anyone in developing your software for this assignment (Yes or No)? It is not necessary to describe discussions with the instructor or TAs.

No

1. Did you give help of any kind to anyone in developing their software for this assignment (Yes or No)?

No

1. Did you examine anyone else’s software for this assignment (Yes or No)? It is not necessary to mention software provided by the instructor.

No

1. Are you the author of every line of source code submitted for this assignment (Yes or No)? It is not necessary to mention software provided by the instructor.

Yes.

1. Are you the author of every word of your report (Yes or No)?

Yes.

## Instructions

***Delete Section 1.2 before you submit your report.***

***You must analyze the experimental results. Don’t just summarize the numbers contained in the table – we can read the table ourselves. Instead, explain what conclusions you can reach based on the experiment. You could discuss how one algorithm compares with the other; stability of results across different parameter settings; effects on Precision or Recall; accuracy vs. computational effort; or other aspects of the experimental results that interest you. You may find it helpful to provide information about a few example queries to make your points, for example queries that had the most dramatic change in performance (good or bad) from diversification, but do not provide information about every query individually. We are primarily interested in your observations about general trends, not quirky queries. Usually a good analysis addresses several issues. Show that you understand what the results mean, based upon what we have discussed in class.***

***Please leave the page breaks between sections, as shown in this file. We hope that this will reduce the number of duplicate pages in your graded report.***

***Instructions are shown in a red italic bold font. Do not include instructions in your report. We will deduct points for leaving instructions in your final report.***

# Experiment: Diversity and relevance baselines

## Experimental Results

***Provide information about the effectiveness of your system in six configurations.***

***Your .zip / .tgz file must include files named HW5-Exp-2.1a.qry, HW5-Exp-2.1a.param, etc., in the QryEval directory. The experimental results shown above must be reproducible by these files and the parameter values shown in the table.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Indri**  **(Exp-2.1a)** | **Indri +**  **PM2**  **(Exp-2.1b)** | **Indri +**  **xQuAD**  **(Exp-2.1c)** | **BM25**  **(Exp-2.1d)** | **BM25+**  **PM2**  **(Exp-2.1e)** | **BM25+**  **xQuAD**  **(Exp-2.1f)** |
| **P-IA@10** | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| **P-IA@20** |  |  |  |  |  |  |
| **αNDCG@20** |  |  |  |  |  |  |
| **P@10** |  |  |  |  |  |  |
| **P@20** |  |  |  |  |  |  |
| **MAP** |  |  |  |  |  |  |

## Parameters

***Document the BM25 and Indri parameter settings that were used to obtain these results.***

## Discussion

***Analyze the experimental results.***

# Experiment: Effect of λ

## Experimental results

***Provide information about the effectiveness of your system when*** *λ* ***is varied.***

***Your .zip / .tgz file must include files named HW5-Exp-3.1a.qry, HW5-Exp-3.1a.param, etc., in the QryEval directory. The experimental results shown above must be reproducible by these files and the parameter values shown in the table.***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Indri + PM2** | | | | |
|  | λ**=0.0**  **(Exp-3.1a)** | λ**=0.33**  **(Exp-3.1b)** | λ**=0.67**  **(Exp-3.1c)** | λ**=1.0**  **(Exp-3.1d)** |
| **P-IA@10** | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| **P-IA@20** |  |  |  |  |
| **αNDCG@20** |  |  |  |  |
| **P@10** |  |  |  |  |
| **P@20** |  |  |  |  |
| **MAP** |  |  |  |  |
| **Indri + xQuAD** | | | | |
|  | λ**=0.0**  **(Exp-3.2a)** | λ**=0.33**  **(Exp-3.2b)** | λ**=0.67**  **(Exp-3.2c)** | λ**=1.0**  **(Exp-3.2d)** |
| **P-IA@10** | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| **P-IA@20** |  |  |  |  |
| **αNDCG@20** |  |  |  |  |
| **P@10** |  |  |  |  |
| **P@20** |  |  |  |  |
| **MAP** |  |  |  |  |

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| --- | --- | --- | --- | --- |
| **BM25 + PM2** | | | | |
|  | λ**=0.0**  **(Exp-3.3a)** | λ**=0.33**  **(Exp-3.3b)** | λ**=0.67**  **(Exp-3.3c)** | λ**=1.0**  **(Exp-3.3d)** |
| **P-IA@10** | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| **P-IA@20** |  |  |  |  |
| **αNDCG@20** |  |  |  |  |
| **P@10** |  |  |  |  |
| **P@20** |  |  |  |  |
| **MAP** |  |  |  |  |
| **BM25 + xQuAD** | | | | |
|  | λ**=0.0**  **(Exp-3.4a)** | λ**=0.33**  **(Exp-3.4b)** | λ**=0.67**  **(Exp-3.4c)** | λ**=1.0**  **(Exp-3.4d)** |
| **P-IA@10** | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| **P-IA@20** |  |  |  |  |
| **αNDCG@20** |  |  |  |  |
| **P@10** |  |  |  |  |
| **P@20** |  |  |  |  |
| **MAP** |  |  |  |  |

## Parameters

***Document the BM25 and Indri parameter settings that were used to obtain these results.***

## Discussion

***Analyze the experimental results.***

# Experiment: The effect of the re-ranking depth

## Experimental results

***Provide information about the effectiveness of your system when the number of documents is varied.***

***Your .zip / .tgz file must include files named HW5-Exp-4.1a.qry, HW5-Exp-4.1a.param, etc., in the QryEval directory. The experimental results shown above must be reproducible by these files and the parameter values shown in the table.***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Indri + PM2** | | | | |
|  | **25 / 25**  **(Exp-4.1a)** | **50 / 25 (Exp-4.1b)** | **100 / 50**  **(Exp-4.1c)** | **200 / 100**  **(Exp-4.1d)** |
| **P-IA@10** | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| **P-IA@20** |  |  |  |  |
| **αNDCG@20** |  |  |  |  |
| **P@10** |  |  |  |  |
| **P@20** |  |  |  |  |
| **MAP** |  |  |  |  |

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| --- | --- | --- | --- | --- |
| **BM25 + PM2** | | | | |
|  | **25 / 25**  **(Exp-4.2a)** | **50 / 25 (Exp-4.2b)** | **100 / 50**  **(Exp-4.2c)** | **200 / 100**  **(Exp-4.2d)** |
| **P-IA@10** | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| **P-IA@20** |  |  |  |  |
| **αNDCG@20** |  |  |  |  |
| **P@10** |  |  |  |  |
| **P@20** |  |  |  |  |
| **MAP** |  |  |  |  |
| **BM25 + xQuAD** | | | | |
|  | **25 / 25**  **(Exp-4.3a)** | **50 / 25 (Exp-4.3b)** | **100 / 50**  **(Exp-4.3c)** | **200 / 100**  **(Exp-4.3d)** |
| **P-IA@10** | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| **P-IA@20** |  |  |  |  |
| **αNDCG@20** |  |  |  |  |
| **P@10** |  |  |  |  |
| **P@20** |  |  |  |  |
| **MAP** |  |  |  |  |

## Parameters

***Document the Indri, BM25, and λ parameter settings that were used to obtain these results.***

## Discussion

***Analyze the experimental results.***

# Experiment: The effect of the search engine suggestions (11-742 Only)

## Experimental results

***Provide information about the effectiveness of your system when using search engine query suggestions to define intents.***

***Your .zip / .tgz file must include files named HW5-Exp-5.1a.qry, HW5-Exp-5.1a.param, etc., in the QryEval directory. The experimental results shown above must be reproducible by these files and the parameter values shown in the table.***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Indri + PM2** | | | | |
|  | **Settings #1** | | **Settings #2** | |
| **TREC**  **Intents**  **(Exp-5.1a)** | **Query**  **Suggestions (Exp-5.1b)** | **TREC Intents (Exp-5.1c)** | **Query Suggestions (Exp-5.1d)** |
| **P-IA@10** | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| **P-IA@20** |  |  |  |  |
| **αNDCG@20** |  |  |  |  |
| **P@10** |  |  |  |  |
| **P@20** |  |  |  |  |
| **MAP** |  |  |  |  |

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| --- | --- | --- | --- | --- |
| **BM25 + xQuAD** | | | | |
|  | **Settings #1** | | **Settings #2** | |
|  | **TREC Intents**  **(Exp-5.2a)** | **Query Suggestions (Exp-5.2b)** | **TREC Intents**  **(Exp-5.2c)** | **Query Suggestions**  **(Exp-5.2d)** |
| **P-IA@10** | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| **P-IA@20** |  |  |  |  |
| **αNDCG@20** |  |  |  |  |
| **P@10** |  |  |  |  |
| **P@20** |  |  |  |  |
| **MAP** |  |  |  |  |

## Query Suggestion Intents

***Document the query suggestions that you used to define search intents.***

## Parameters

***Document the Indri, BM25, λ, and reranking parameter settings that were used to obtain these results.***

## Discussion

***Analyze the experimental results.***