**Overall Description**:  
The database utilizes the jdbm1.0 storage mechanism to store data in a (Key, Value) format, where "|" and "," are used as separators within the values (“|” is for different types of data of a record and “,” is for numerous records). There is one db file since we use one “Record Manager” to include all of the 8 databases as the “Object”. Here are the descriptions for each database:

**PageInfo**: This table contains information about each page crawled by the web crawler. It includes fields such as PageID (unique identifier), PageTitle, URL, LastModificationDate, and SizeofPage.

**PageURLMapping**: This table maps URLs to their respective PageIDs. It helps in quickly retrieving the PageID associated with a given URL.

**PageParentMapping**: This table maps parent links to their respective child pages. It allows efficient tracking of parent links associated with each child page.

**PageChildMapping**: This table maps child links to their respective parent pages. It allows efficient tracking of child links associated with each parent page.

**InvertedBodyWord**: This table stores the inverted index for words found in the body of pages. It includes fields like WordID (unique identifier for body words), PageID (ID of the page containing the word), Frequency (frequency of the word in the body), and TFIDF (TF-IDF value of the word).

**BodyWordMapping**: This table maps body words to the pages they appear in aInteger with their frequencies. It facilitates the retrieval of words associated with each page and their frequencies.

**InvertedTitleWord**: Similar to InvertedBodyWord, this table stores the inverted index for words found in the title of pages. It includes fields like TitleWordID, PageID, Frequency, and TFIDF.

**WordMapping**: This table maps body word IDs to their respective words. It helps in retrieving the actual word given its ID.

**Database Design**:

We use the true data types in the design stage. However, we implement the key and value as “String” type for easy implementation. Here are the database designs:

**PageInfo**  
Description: Contains information about each page.

|  |  |  |
| --- | --- | --- |
| **Field Name** | **Data Type** | **Description** |
| PageID | Integer | Unique key ID for pages |
| PageTitle | String | Title of the page |
| URL | String | URL of the page |
| LastModificationDate | String | Date of the last modification |
| SizeofPage | Integer | Size of the page |
| MaxFreq | Int | Maximum Term Frequency of the page |

Data:

|  |  |
| --- | --- |
| 1 | COMP4321 Project Website|[www.testing.net](http://www.testing.net)|11/03/2024|96|20 |

**PageURLMapping**  
Description: Maps URL to their respective PageID.

|  |  |  |
| --- | --- | --- |
| **Field Name** | **Data Type** | **Description** |
| URL | String | URL of the page |
| PageID | Integer | Unique key ID for pages |

Data:

|  |  |
| --- | --- |
| [www.testing.net](http://www.testing.net) | 1 |

**PageParentMapping**Description: Maps child links to their respective parent pages.

|  |  |  |
| --- | --- | --- |
| **Field Name** | **Data Type** | **Description** |
| PageID | Integer | ID of the parent page |
| ParentID | Integer | ID of the parent pages |

Data:

|  |  |
| --- | --- |
| 3 | 1, 2 |

**PageChildMapping**  
Description: Maps child links to their respective parent pages.

|  |  |  |
| --- | --- | --- |
| **Field Name** | **Data Type** | **Description** |
| PageID | Integer | ID of the parent page |
| ChildID | Integer | ID of the child pages |

Data:

|  |  |
| --- | --- |
| 1 | 2, 3 |

**InvertedBodyWord**  
Description: Stores inverted index for words found in the body of pages.

|  |  |  |
| --- | --- | --- |
| **Field Name** | **Data Type** | **Description** |
| WordID | Integer | Unique identifier for body words |
| PageID | Integer | ID of the page containing the word |
| Frequency | Integer | Frequency of the word in the body |
| TFIDF | Double | TF-IDF value of the word |

Data:

|  |  |
| --- | --- |
| 1 | 1|5|2.1, 2|4|1.8 |

**BodyWordMapping**  
Description: Maps body words to the pages they appear in.

|  |  |  |
| --- | --- | --- |
| **Field Name** | **Data Type** | **Description** |
| PageID | Integer | ID of the page |
| WordID | Integer | ID of the body word |
| Frequncy | Integer | Frequency of the word |
| Word | String | The Word |

Data:

|  |  |
| --- | --- |
| 1 | 1|3|apple, 3|4|egg, 6|5|test, |

**InvertedTitleWord**  
Description: Stores inverted index for words found in the title of pages.

|  |  |  |
| --- | --- | --- |
| **Field Name** | **Data Type** | **Description** |
| TitleWordID | Integer | Unique identifier for title words |
| PageID | Integer | ID of the page containing the word |
| Frequency | Integer | Frequency of the word in the title |
| TFIDF | Double | TF-IDF value of the word |

Data:

|  |  |
| --- | --- |
| 3 | 1|5|2.1, 2|4|1.8 |

**WordMapping**  
Description: Maps body word IDs to their respective words.

|  |  |  |
| --- | --- | --- |
| **Field Name** | **Data Type** | **Description** |
| Word | String | Body word |
| WordID | Integer | ID of the body word |

Data:

|  |  |
| --- | --- |
| Apple | 1 |