**Assignment 4**

**Code**

#include <iostream>

#include <vector>

#include <set>

#include <sstream>

#include <string>

using namespace std;

// Function to calculate precision and recall

pair<float, float> calculate\_precision\_recall(const set<string>& answer\_set, const set<string>& relevant\_docs) {

    // Intersection of retrieved documents and relevant documents

    set<string> relevant\_retrieved;

    for (const auto& doc : answer\_set) {

        if (relevant\_docs.find(doc) != relevant\_docs.end()) {

            relevant\_retrieved.insert(doc);

        }

    }

    // Calculate precision and recall

    float precision = answer\_set.size() > 0 ? (float)relevant\_retrieved.size() / answer\_set.size() : 0;

    float recall = relevant\_docs.size() > 0 ? (float)relevant\_retrieved.size() / relevant\_docs.size() : 0;

    return {precision, recall};

}

// Function to get user input for documents

set<string> input\_documents(const string& prompt) {

    cout << prompt << endl;

    string input;

    getline(cin, input);

    set<string> docs;

    stringstream ss(input);

    string doc;

    while (getline(ss, doc, ',')) {

        docs.insert(doc);  // Add document to set, automatically removing duplicates

    }

    return docs;

}

int main() {

    // Input for retrieved documents (answer set)

    set<string> answer\_set\_A = input\_documents("Enter the retrieved documents for the query (separated by commas):");

    // Input for relevant documents

    set<string> relevant\_docs\_Rq1 = input\_documents("Enter the relevant documents for the query (separated by commas):");

    // Calculate precision and recall

    auto [precision, recall] = calculate\_precision\_recall(answer\_set\_A, relevant\_docs\_Rq1);

    // Display precision and recall

    cout << "\nPrecision: " << precision << endl;

    cout << "Recall: " << recall << endl;

    return 0;

}

**OUTPUT**

Enter the retrieved documents for the query (separated by commas):

d123,d84,d56,d6,d8,d9,d511,d129,d187,d25,d38,d48,d250,d113,d3

Enter the relevant documents for the query (separated by commas):

d123,d56,d9,d25,d3

Precision: 0.333333

Recall: 1