Vigenere-EDB

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Chapter 1

File Index

1.1 File List

Here is a list of all files with brief descriptions:

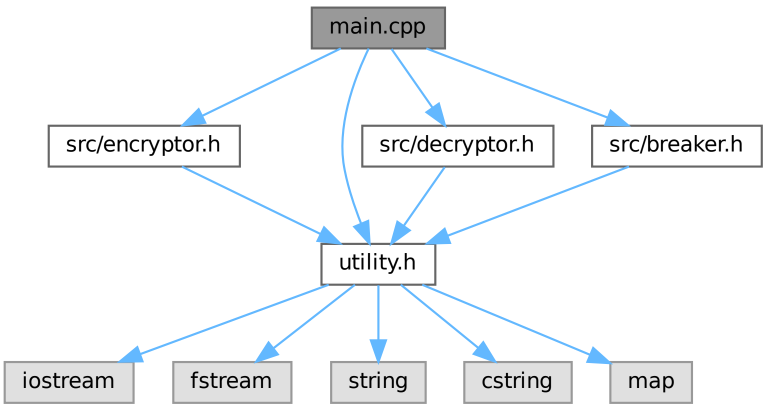
Chapter 2

File Documentation

2.1 main.cpp File Reference

```
#include "src/encryptor.h"
#include "src/decryptor.h"
#include "src/breaker.h"
#include "src/utility.h"
```

Include dependency graph for main.cpp:



Functions

- int main (int argc, char ∗argv[ ])

  Entry point of the application.

2.1.1 Function Documentation

2.1.1.1 main()

```
int main (
            int argc,
            char * argv[] )
```

Entry point of the application.

This program supports three modes of operation:

- Encryption: Encrypts the input file using a specified key.
- Decryption: Decrypts the input file using a specified key.
- Breaking: Attempts to break the encryption on the input file without a key.

Parameters

argc	Number of command-line arguments.
argv	Array of command-line arguments. • Mode: Specify "-en" for encryption, "-de" for decryption, or "-br" for breaking. • InputFile: Path to the input file to process. • OutputFile: Path to save the processed output. • KeyFile: Path to the key file (required for encryption and decryption).

Returns

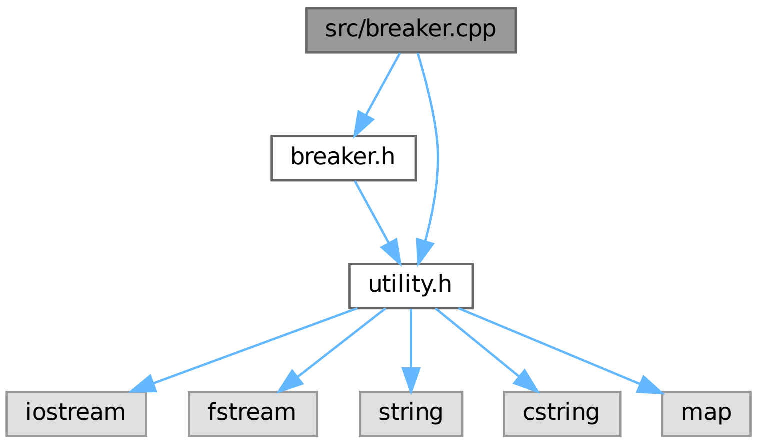
Exit status of the program.

- 0: Success.
- 1: Invalid mode specified.
- -1: Error in parsing arguments or execution.

2.2 src/breaker.cpp File Reference

```
#include "breaker.h"
#include "utility.h"
```

Include dependency graph for breaker.cpp:



Functions

- int breakFile (const std::string &targetFile, const std::string &outputFile)

  Attempts to break the encryption of a file and write the decrypted output.

2.2.1 Function Documentation

2.2.1.1 breakFile()

```
int breakFile (
            const std::string & targetFile,
            const std::string & outputFile )
```

Attempts to break the encryption of a file and write the decrypted output.

Attempts to break the encryption of a file.

This function analyzes the encrypted file, determines the likely key length, derives the encryption key, and decrypts the file. The result is saved to the output file.

Parameters

targetFile	The path to the encrypted file to be analyzed and decrypted.
outputFile	The path to the file where decrypted content will be saved.

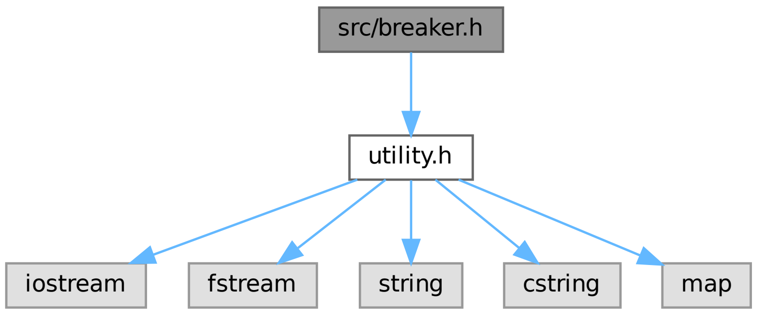
Returns

int Returns 0 on success, or a non-zero error code on failure.

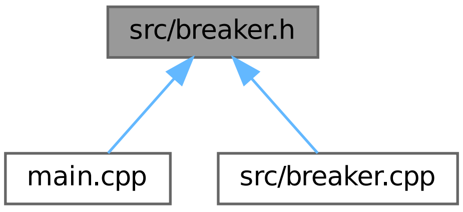
2.3 src/breaker.h File Reference

```
#include "utility.h"
```

Include dependency graph for breaker.h:



This graph shows which files directly or indirectly include this file:



Functions

- int breakFile (const std::string &targetFile, const std::string &outputFile)

  Attempts to break the encryption of a file.

2.3.1 Function Documentation

2.3.1.1 breakFile()

```
int breakFile (
            const std::string & targetFile,
            const std::string & outputFile )
```

Attempts to break the encryption of a file.

This function analyzes the target file and attempts to break its encryption, saving the results to the specified output file. The exact breaking method depends on the implementation in the source file.

Parameters

targetFile	The path to the file to analyze and attempt to break.
outputFile	The path where the results will be saved.

Returns

int Returns 0 on success, or a non-zero error code on failure.

Attempts to break the encryption of a file.

This function analyzes the encrypted file, determines the likely key length, derives the encryption key, and decrypts the file. The result is saved to the output file.

Parameters

targetFile	The path to the encrypted file to be analyzed and decrypted.
outputFile	The path to the file where decrypted content will be saved.

Returns

int Returns 0 on success, or a non-zero error code on failure.

2.4 breaker.h

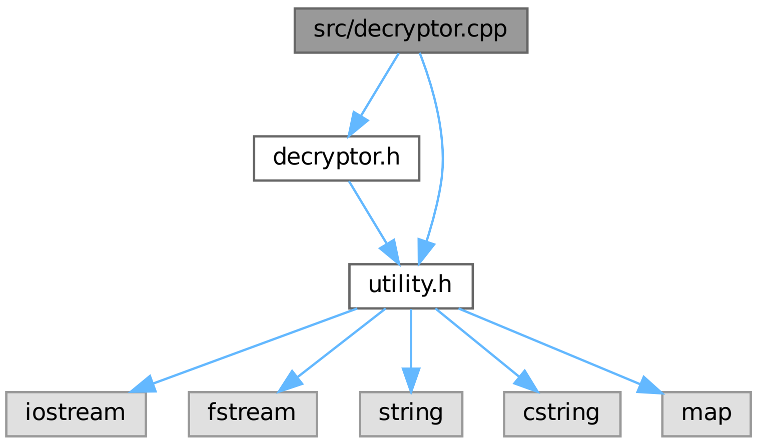
Go to the documentation of this file.

```

#pragma once
#include "utility.h"

int breakFile(const std::string& targetFile, const std::string& outputFile);
```

2.5 src/decryptor.cpp File Reference

```
#include "decryptor.h"
#include "utility.h"
```

Include dependency graph for decryptor.cpp:



Functions

- int decrypt (const std::string &inputFile, const std::string &outputFile, const std::string &keyFile)
  Decrypts the input file data using a specified key and saves the result to an output file.

2.5.1 Function Documentation

2.5.1.1 decrypt()

```
int decrypt (
             const std::string & inputFile,
             const std::string & outputFile,
             const std::string & keyFile )
```

Decrypts the input file data using a specified key and saves the result to an output file.

Decrypts an input file using the provided key.

This function reads the encrypted data and the decryption key from the specified files, performs the decryption by shifting each character based on the key, and then writes the decrypted data to the output file.

Parameters

inputFile	The path to the file containing the encrypted data.
outputFile	The path to the file where the decrypted data will be saved.
keyFile	The path to the file containing the decryption key.

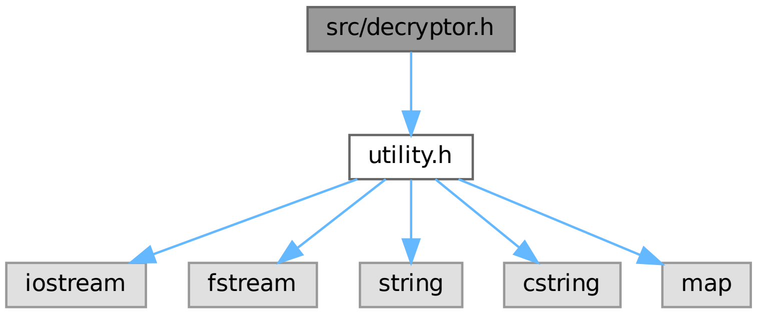
Returns

Returns 0 if the decryption was successful, or -1 if an error occurred during the process (e.g., invalid key or file reading issues).

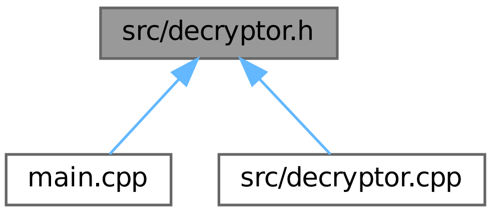
2.6 src/decryptor.h File Reference

```
#include "utility.h"
```

Include dependency graph for decryptor.h:



This graph shows which files directly or indirectly include this file:



Functions

- int decrypt (const std::string &inputFile, const std::string &outputFile, const std::string &keyFile)

  Decrypts an input file using the provided key.

2.6.1 Function Documentation

2.6.1.1 decrypt()

```
int decrypt (
            const std::string & inputFile,
            const std::string & outputFile,
            const std::string & keyFile )
```

Decrypts an input file using the provided key.

This function reads an encrypted file and decrypts its contents using the key specified in the key file. The decrypted output is saved to the specified output file.

Parameters

inputFile	The path to the encrypted input file.
outputFile	The path to the output file where decrypted content will be saved.
keyFile	The path to the key file containing the decryption key.

Returns

int Returns 0 on successful decryption, or a non-zero error code on failure.

Decrypts an input file using the provided key.

This function reads the encrypted data and the decryption key from the specified files, performs the decryption by shifting each character based on the key, and then writes the decrypted data to the output file.

Parameters

inputFile	The path to the file containing the encrypted data.
outputFile	The path to the file where the decrypted data will be saved.
keyFile	The path to the file containing the decryption key.

Returns

Returns 0 if the decryption was successful, or -1 if an error occurred during the process (e.g., invalid key or file reading issues).

2.7 decryptor.h

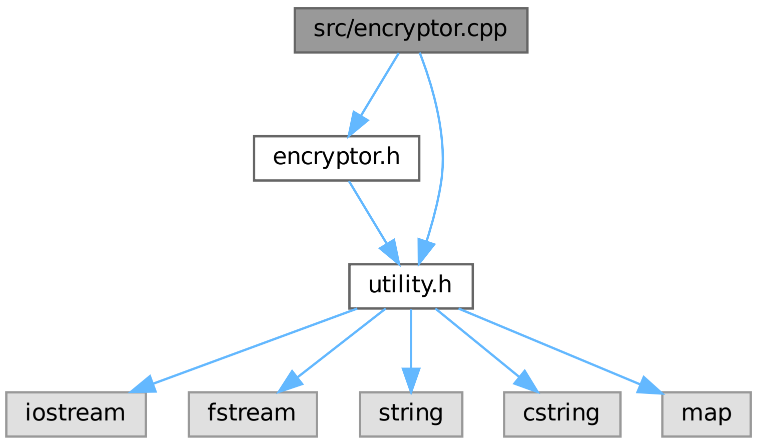
Go to the documentation of this file.

```

#pragma once
#include "utility.h"

int decrypt(const std::string& inputFile, const std::string& outputFile, const std::string& keyFile);
```

2.8 src/encryptor.cpp File Reference

```
#include "encryptor.h"
#include "utility.h"
```

Include dependency graph for encryptor.cpp:



Functions

- int encrypt (const std::string &inputFile, const std::string &outputFile, const std::string &keyFile)

  Encrypts the input file data using a specified key and saves the result to an output file.

2.8.1 Function Documentation

2.8.1.1 encrypt()

```
int encrypt (
            const std::string & inputFile,
            const std::string & outputFile,
            const std::string & keyFile )
```

Encrypts the input file data using a specified key and saves the result to an output file.

Encrypts an input file using the provided key.

This function reads the plain text data and the encryption key from the specified files, performs the encryption by shifting each character based on the key, and then writes the encrypted data to the output file.

Parameters

inputFile	The path to the file containing the plain text data.
outputFile	The path to the file where the encrypted data will be saved.
keyFile	The path to the file containing the encryption key.

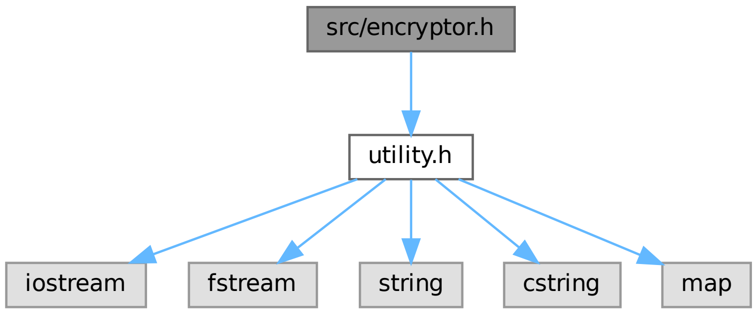
Returns

Returns 0 if the encryption was successful, or -1 if an error occurred during the process (e.g., invalid key or file reading issues).

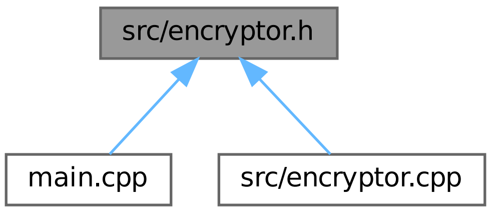
2.9 src/encryptor.h File Reference

```
#include "utility.h"
```

Include dependency graph for encryptor.h:



This graph shows which files directly or indirectly include this file:



Functions

- int encrypt (const std::string &inputFile, const std::string &outputFile, const std::string &keyFile)

  Encrypts an input file using the provided key.

2.9.1 Function Documentation

2.9.1.1 encrypt()

```
int encrypt (
            const std::string & inputFile,
            const std::string & outputFile,
            const std::string & keyFile )
```

Encrypts an input file using the provided key.

This function reads a plaintext file and encrypts its contents using the key specified in the key file. The encrypted output is saved to the specified output file.

Parameters

inputFile	The path to the plaintext input file.
outputFile	The path to the output file where encrypted content will be saved.
keyFile	The path to the key file containing the encryption key.

Returns

int Returns 0 on successful encryption, or a non-zero error code on failure.

Encrypts an input file using the provided key.

This function reads the plain text data and the encryption key from the specified files, performs the encryption by shifting each character based on the key, and then writes the encrypted data to the output file.

Parameters

inputFile	The path to the file containing the plain text data.
outputFile	The path to the file where the encrypted data will be saved.
keyFile	The path to the file containing the encryption key.

Returns

Returns 0 if the encryption was successful, or -1 if an error occurred during the process (e.g., invalid key or file reading issues).

2.10 encryptor.h

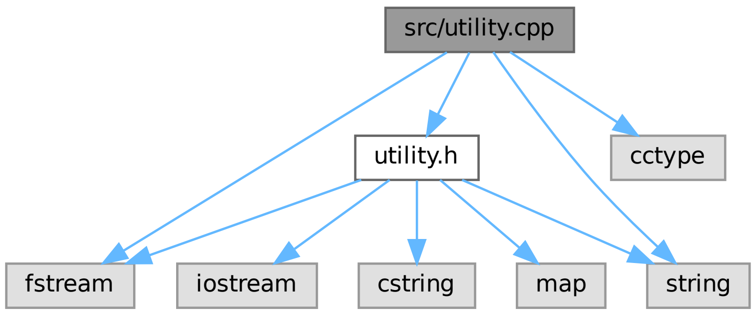
Go to the documentation of this file.

```
#pragma once
#include "utility.h"

int encrypt(const std::string& inputFile, const std::string& outputFile, const std::string& keyFile);
```

2.11 src/utility.cpp File Reference

```
#include "utility.h"
#include <cctype>
#include <fstream>
#include <string>
```

Include dependency graph for utility.cpp:



Functions

- long long int nextValidKeyIndex (const std::string &key, long long int currentIndex)

  Finds the next valid index in the key string.
- bool getKeyDataFromFile (const std::string &filename, std::string &key)

  Reads the key data from a file into a string.
- bool getTextDataFromFile (const std::string &filename, std::string &textData)

  Reads text data from a file into a string.
- void stringToLowercase (std::string &str)

  Converts a string to lowercase.
- bool saveToFile (const std::string &filename, const std::string &data)

  Saves data to a file.
- void fillRawText (const std::string &filename, std::string &rawText)

  Extracts raw alphabetical text from a file.
- void fillFrequencyTableFromText (const std::string &rawText, long long unsigned int ∗frequencyTable)

  Fills a frequency table based on the text.
- void decrypt (std::string &inputData, const std::string &key)

  Decrypts text data using a Vigenère cipher key.
- char getCaesarKey (std::string &inputData, long long unsigned int ∗frequencyTable)

  Determines the Caesar cipher key for a given text group.
- double getIndexOfCoincidence (long long unsigned int ∗frequencyTable)

  Calculates the index of coincidence for a frequency table.
- long long unsigned int getKeyLength (const std::string &rawText)

  Determines the likely key length for a Vigenère cipher.
- void printHelp ()

  Prints help information about the program's usage.
- bool parceArguments (int argc, char ∗∗argv, std::string &mode, std::string &inputFile, std::string &outputFile, std::string &keyFile)

  Parses command-line arguments to configure the program.

2.11.1 Function Documentation

2.11.1.1 decrypt()

```
void decrypt (
            std::string & inputData,
            const std::string & key )
```

Decrypts text data using a Vigenère cipher key.

Decrypts input data using the given key.

This function decrypts the input data using the provided key and modifies the data in place.

Parameters

inputData	The encrypted text to decrypt.
key	The Vigenère cipher key.

2.11.1.2 fillFrequencyTableFromText()

```
void fillFrequencyTableFromText (
            const std::string & rawText,
            long long unsigned int * frequencyTable )
```

Fills a frequency table based on the text.

Populates a frequency table from the given text.

This function updates the provided frequency table based on the occurrence of each letter in the raw text.

Parameters

rawText	The input text to analyze.
frequencyTable	An array to store the frequency of each letter.

2.11.1.3 fillRawText()

```
void fillRawText (
            const std::string & filename,
            std::string & rawText )
```

Extracts raw alphabetical text from a file.

Reads raw text from a file into a string.

This function reads a file, filters out non-alphabetical characters, and converts uppercase characters to lowercase.

Parameters

filename	The name of the file to process.
rawText	The string where the raw text will be stored.

2.11.1.4 getCaesarKey()

```
char getCaesarKey (
            std::string & inputData,
            long long unsigned int * frequencyTable )
```

Determines the Caesar cipher key for a given text group.

Determines the Caesar cipher key from input data.

Analyzes the input data and determines the most likely Caesar cipher key by comparing letter frequencies.

Parameters

inputData	The text to analyze.
frequencyTable	A frequency table to be used during analysis.

Returns

char The most likely Caesar cipher key.

2.11.1.5 getIndexOfCoincidence()

```
double getIndexOfCoincidence (
            long long unsigned int * frequencyTable )
```

Calculates the index of coincidence for a frequency table.

Computes the Index of Coincidence for a frequency table.

This metric is used to analyze the likelihood of a particular key length in cryptographic analysis.

Parameters

frequencyTable	A table of letter frequencies.

Returns

double The calculated index of coincidence.

2.11.1.6 getKeyDataFromFile()

```
bool getKeyDataFromFile (
            const std::string & filename,
            std::string & key )
```

Reads the key data from a file into a string.

Reads key data from a file.

This function reads the contents of the specified file and stores the data in the provided key string.

Parameters

filename	The name of the file containing the key.
key	The string where the key data will be stored.

Returns

bool True if the key data is successfully read, false otherwise.

2.11.1.7 getKeyLength()

```
long long unsigned int getKeyLength (
            const std::string & rawText )
```

Determines the likely key length for a Vigenère cipher.

Determines the key length of the given text.

Analyzes the input text and determines the most likely key length based on statistical analysis.

Parameters

rawText	The text to analyze.

Returns

long long unsigned int The most likely key length, or 0 if none is found.

2.11.1.8 getTextDataFromFile()

```
bool getTextDataFromFile (
            const std::string & filename,
            std::string & textData )
```

Reads text data from a file into a string.

Reads text data from a file.

This function reads the contents of a file line by line and appends it to the provided string.

Parameters

filename	The name of the file containing the text data.
textData	The string where the text data will be stored.

Returns

bool True if the text data is successfully read, false otherwise.

2.11.1.9 nextValidKeyIndex()

```
long long int nextValidKeyIndex (
            const std::string & key,
            long long int currentIndex )
```

Finds the next valid index in the key string.

Finds the next valid key index.

This function increments the index until it points to a valid lowercase alphabetical character. Returns -1 if no valid characters are found.

Parameters

key	The key string to iterate through.
currentIndex	The current index in the key string.

Returns

long long int The next valid index, or -1 if none exist.

2.11.1.10 parceArguments()

```
bool parceArguments (
            int argc,
            char ** argv,
            std::string & mode,
            std::string & inputFile,
            std::string & outputFile,
            std::string & keyFile )
```

Parses command-line arguments to configure the program.

Parses command-line arguments and extracts required values.

Parses and validates command-line arguments for setting operation mode, input file, output file, and key file paths.

Parameters

argc	The number of command-line arguments.

Parameters

argv	The array of command-line arguments.
mode	A reference to store the chosen mode.
inputFile	A reference to store the input file path.
outputFile	A reference to store the output file path.
keyFile	A reference to store the key file path.

Returns

bool True if arguments are successfully parsed, false otherwise.

2.11.1.11 printHelp()

```
void printHelp ( )
```

Prints help information about the program's usage.

Prints help information to the console.

Displays the supported flags, their purposes, and example usage.

2.11.1.12 saveToFile()

```
bool saveToFile (
            const std::string & filename,
            const std::string & data )
```

Saves data to a file.

Saves data to a file with a chosen separator.

Writes the provided data to a file with the specified filename.

Parameters

filename	The name of the file to save the data.
data	The string data to be written to the file.

Returns

bool True if the data is successfully saved, false otherwise.

2.11.1.13 stringToLowercase()

```
void stringToLowercase (
            std::string & str )
```

Converts a string to lowercase.

Converts every character of a string to its lowercase version.

This function modifies the provided string by converting all uppercase letters to their lowercase equivalents.

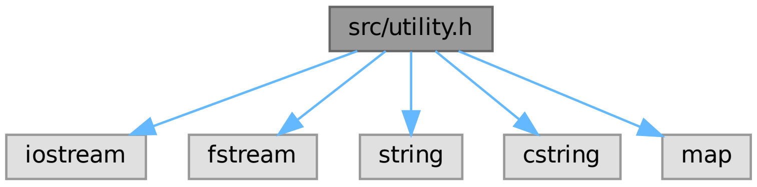
Parameters

str	The string to convert to lowercase.

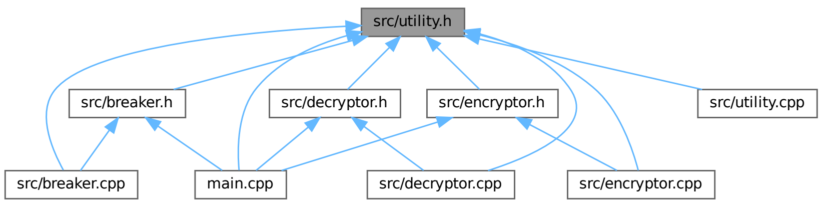
2.12 src/utility.h File Reference

```
#include <iostream>
#include <fstream>
#include <string>
#include <cstring>
#include <map>
```

Include dependency graph for utility.h:



This graph shows which files directly or indirectly include this file:



Functions

- double getIndexOfCoincidence (long long unsigned int ∗frequencyTable)

    Computes the Index of Coincidence for a frequency table.
- void decrypt (std::string &inputData, const std::string &key)

Decrypts input data using the given key.

- char getCaesarKey (std::string &inputData, long long unsigned int ∗frequencyTable)

  Determines the Caesar cipher key from input data.
- void fillRawText (const std::string &filename, std::string &rawText)

  Reads raw text from a file into a string.
- void fillFrequencyTableFromText (const std::string &rawText, long long unsigned int ∗frequencyTable)

  Populates a frequency table from the given text.
- long long unsigned int getKeyLength (const std::string &rawText)

  Determines the key length of the given text.
- long long int nextValidKeyIndex (const std::string &key, long long int currentIndex)

  Finds the next valid key index.
- bool saveToFile (const std::string &filename, const std::string &data)

  Saves data to a file with a chosen separator.
- void stringToLowercase (std::string &str)

  Converts every character of a string to its lowercase version.
- bool getTextDataFromFile (const std::string &filename, std::string &textData)

  Reads text data from a file.
- bool getKeyDataFromFile (const std::string &filename, std::string &key)

  Reads key data from a file.
- void printHelp ()

  Prints help information to the console.
- bool parceArguments (int argc, char ∗∗argv, std::string &mode, std::string &inputFile, std::string &outputFile, std::string &keyFile)

  Parses command-line arguments and extracts required values.

Variables

- const int ASCII_TEXT_MARGIN = 97

  ASCII margin value for text processing.
- const double FREQUENCY_TABLE [ ]

  Percent frequency of every letter in English text.

2.12.1 Function Documentation

2.12.1.1 decrypt()

```
void decrypt (
            std::string & inputData,
            const std::string & key )
```

Decrypts input data using the given key.

Parameters

inputData	The data to be decrypted.
key	The decryption key.

Decrypts input data using the given key.

This function decrypts the input data using the provided key and modifies the data in place.

Parameters

inputData	The encrypted text to decrypt.
key	The Vigenère cipher key.

2.12.1.2 fillFrequencyTableFromText()

```
void fillFrequencyTableFromText (
            const std::string & rawText,
            long long unsigned int * frequencyTable )
```

Populates a frequency table from the given text.

Parameters

rawText	The text to analyze.
frequencyTable	The frequency table to populate.

Populates a frequency table from the given text.

This function updates the provided frequency table based on the occurrence of each letter in the raw text.

Parameters

rawText	The input text to analyze.
frequencyTable	An array to store the frequency of each letter.

2.12.1.3 fillRawText()

```
void fillRawText (
            const std::string & filename,
            std::string & rawText )
```

Reads raw text from a file into a string.

Parameters

filename	The name of the file to read.
rawText	The string to store the raw text.

Reads raw text from a file into a string.

This function reads a file, filters out non-alphabetical characters, and converts uppercase characters to lowercase.

Parameters

filename	The name of the file to process.
rawText	The string where the raw text will be stored.

2.12.1.4 getCaesarKey()

```
char getCaesarKey (
            std::string & inputData,
            long long unsigned int * frequencyTable )
```

Determines the Caesar cipher key from input data.

Parameters

inputData	The data to analyze.
frequencyTable	The frequency table to use for analysis.

Returns

The determined Caesar cipher key.

Determines the Caesar cipher key from input data.

Analyzes the input data and determines the most likely Caesar cipher key by comparing letter frequencies.

Parameters

inputData	The text to analyze.
frequencyTable	A frequency table to be used during analysis.

Returns

char The most likely Caesar cipher key.

2.12.1.5 getIndexOfCoincidence()

```
double getIndexOfCoincidence (
            long long unsigned int * frequencyTable )
```

Computes the Index of Coincidence for a frequency table.

Parameters

frequencyTable	The frequency table to analyze.

Returns

The Index of Coincidence.

Computes the Index of Coincidence for a frequency table.

This metric is used to analyze the likelihood of a particular key length in cryptographic analysis.

Parameters

frequencyTable	A table of letter frequencies.

Returns

double The calculated index of coincidence.

2.12.1.6 getKeyDataFromFile()

```
bool getKeyDataFromFile (
            const std::string & filename,
            std::string & key )
```

Reads key data from a file.

Parameters

filename	The name of the file to read.
key	The string to store the key data.

Returns

True if the operation succeeds, false otherwise.

Reads key data from a file.

This function reads the contents of the specified file and stores the data in the provided key string.

Parameters

filename	The name of the file containing the key.
key	The string where the key data will be stored.

Returns

bool True if the key data is successfully read, false otherwise.

2.12.1.7 getKeyLength()

```
long long unsigned int getKeyLength (
            const std::string & rawText )
```

Determines the key length of the given text.

Parameters

rawText	The text to analyze.

Returns

The determined key length.

Determines the key length of the given text.

Analyzes the input text and determines the most likely key length based on statistical analysis.

Parameters

rawText	The text to analyze.

Returns

long long unsigned int The most likely key length, or 0 if none is found.

2.12.1.8 getTextDataFromFile()

```
bool getTextDataFromFile (
            const std::string & filename,
            std::string & textData )
```

Reads text data from a file.

Parameters

filename	The name of the file to read.
textData	The string to store the text data.

Returns

True if the operation succeeds, false otherwise.

Reads text data from a file.

This function reads the contents of a file line by line and appends it to the provided string.

Parameters

filename	The name of the file containing the text data.
textData	The string where the text data will be stored.

Returns

bool True if the text data is successfully read, false otherwise.

2.12.1.9 nextValidKeyIndex()

```
long long int nextValidKeyIndex (
            const std::string & key,
            long long int currentIndex )
```

Finds the next valid key index.

Parameters

key	The key string to analyze.
currentIndex	The current index to start from.

Returns

The next valid key index, or -1 if none are found.

Finds the next valid key index.

This function increments the index until it points to a valid lowercase alphabetical character. Returns -1 if no valid characters are found.

Parameters

key	The key string to iterate through.
currentIndex	The current index in the key string.

Returns

long long int The next valid index, or -1 if none exist.

2.12.1.10 parceArguments()

```
bool parceArguments (
            int argc,
            char ** argv,
            std::string & mode,
            std::string & inputFile,
            std::string & outputFile,
            std::string & keyFile )
```

Parses command-line arguments and extracts required values.

Parameters

argc	The number of arguments.
argv	The array of argument strings.
mode	The mode of operation (e.g., "-en", "-de", "-br").
inputFile	The input file path.
outputFile	The output file path.
keyFile	The key file path.

Returns

True if arguments are parsed successfully, false otherwise.

Parses command-line arguments and extracts required values.

Parses and validates command-line arguments for setting operation mode, input file, output file, and key file paths.

Parameters

argc	The number of command-line arguments.
argv	The array of command-line arguments.
mode	A reference to store the chosen mode.
inputFile	A reference to store the input file path.
outputFile	A reference to store the output file path.
keyFile	A reference to store the key file path.

Returns

bool True if arguments are successfully parsed, false otherwise.

2.12.1.11 printHelp()

```
void printHelp ( )
```

Prints help information to the console.

Prints help information to the console.

Displays the supported flags, their purposes, and example usage.

2.12.1.12 saveToFile()

```
bool saveToFile (
             const std::string & filename,
             const std::string & data )
```

Saves data to a file with a chosen separator.

Parameters

filename	The name of the file to save to.
data	The data to save.

Returns

True if the save operation succeeds, false otherwise.

Saves data to a file with a chosen separator.

Writes the provided data to a file with the specified filename.

Parameters

filename	The name of the file to save the data.
data	The string data to be written to the file.

Returns

bool True if the data is successfully saved, false otherwise.

2.12.1.13 stringToLowercase()

```
void stringToLowercase (
            std::string & str )
```

Converts every character of a string to its lowercase version.

Parameters

str	The string to convert.

Converts every character of a string to its lowercase version.

This function modifies the provided string by converting all uppercase letters to their lowercase equivalents.

Parameters

str	The string to convert to lowercase.

2.12.2 Variable Documentation

2.12.2.1 ASCII_TEXT_MARGIN

```
const int ASCII_TEXT_MARGIN = 97
```

ASCII margin value for text processing.

2.12.2.2 FREQUENCY_TABLE

```
const double FREQUENCY_TABLE[]
```

Initial value:

```
= {
  0.08167, 0.01492, 0.02782, 0.04253, 0.02702, 0.02228, 0.02015, 0.06094,
  0.06966, 0.00153, 0.00772, 0.04025, 0.02406, 0.06749, 0.07507, 0.01929,
  0.00095, 0.05987, 0.06327, 0.09056, 0.02758, 0.00978, 0.02360, 0.00150,
  0.01975, 0.00074
}
```

Percent frequency of every letter in English text.

2.13 utility.h

Go to the documentation of this file.

```cpp

#pragma once
#include <iostream>
#include <fstream>
#include <string>
#include <cstring>
#include <map>

const int ASCII_TEXT_MARGIN = 97;

const double FREQUENCY_TABLE[] = {
  0.08167, 0.01492, 0.02782, 0.04253, 0.02702, 0.02228, 0.02015, 0.06094,
  0.06966, 0.00153, 0.00772, 0.04025, 0.02406, 0.06749, 0.07507, 0.01929,
  0.00095, 0.05987, 0.06327, 0.09056, 0.02758, 0.00978, 0.02360, 0.00150,
  0.01975, 0.00074
};

double getIndexOfCoincidence(long long unsigned int*frequencyTable);

void decrypt(std::string& inputData, const std::string& key);

char getCaesarKey(std::string& inputData, long long unsigned int* frequencyTable);

void fillRawText(const std::string& filename, std::string& rawText);

void fillFrequencyTableFromText (const std::string& rawText , long long unsigned int* frequencyTable);

long long unsigned int getKeyLength(const std::string& rawText);

long long int nextValidKeyIndex(const std::string &key, long long int currentIndex);

bool saveToFile(const std::string& filename, const std::string& data);

void stringToLowercase(std::string& str);

bool getTextDataFromFile(const std::string& filename, std::string& textData);

bool getKeyDataFromFile(const std::string& filename, std::string& key);

void printHelp();

bool parceArguments(int argc, char** argv, std::string& mode, std::string& inputFile, std::string& outputFile, std::string& keyFile);

```

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