B.M.S College of Engineering

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DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

Course –Java Programming
Course Code – 19IS4PCJAV
AY 2020-21

Final report on mini Project work

Cipher-It

An Encryption - Decryption Software

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CERTIFICATE

Certified that the Project has been successfully presented at **B.M.S College Of Engineering** by **H Nidhi** bearing USN: 1BM19IS056 and **Meghana Rathanraj** bearing USN: 1BM19IS087 in partial fulfilment of the requirements for the IV Semester degree in **Bachelor of Engineering in Information Science & Engineering** of **Visvesvaraya Technological University, Belgaum** as a part the course **JAVA programming (19IS4PCJAV)** during academic year 2020-2021.

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CONTENTS

ABSTRACT

In times where everything from entertainment to education to financial transactions is online, data security and thus data encryption becomes vital to prevent the misuse of our data.The goal of this project is to provide the interface for a user to encrypt or decrypt meaningful & important data for safety purposes.

Encryption is the process of translating plain text data into something that appears to be random and meaningless. Decryption is the process of converting ciphertext back to plaintext.

The goal of every encryption algorithm is to make it as difficult as possible to decrypt the generated ciphertext without using the key. If a really good encryption algorithm is used, there is no technique significantly better than methodically trying every possible key. When selecting an encryption algorithm, it is a good idea to choose one that has successfully resisted attacks.

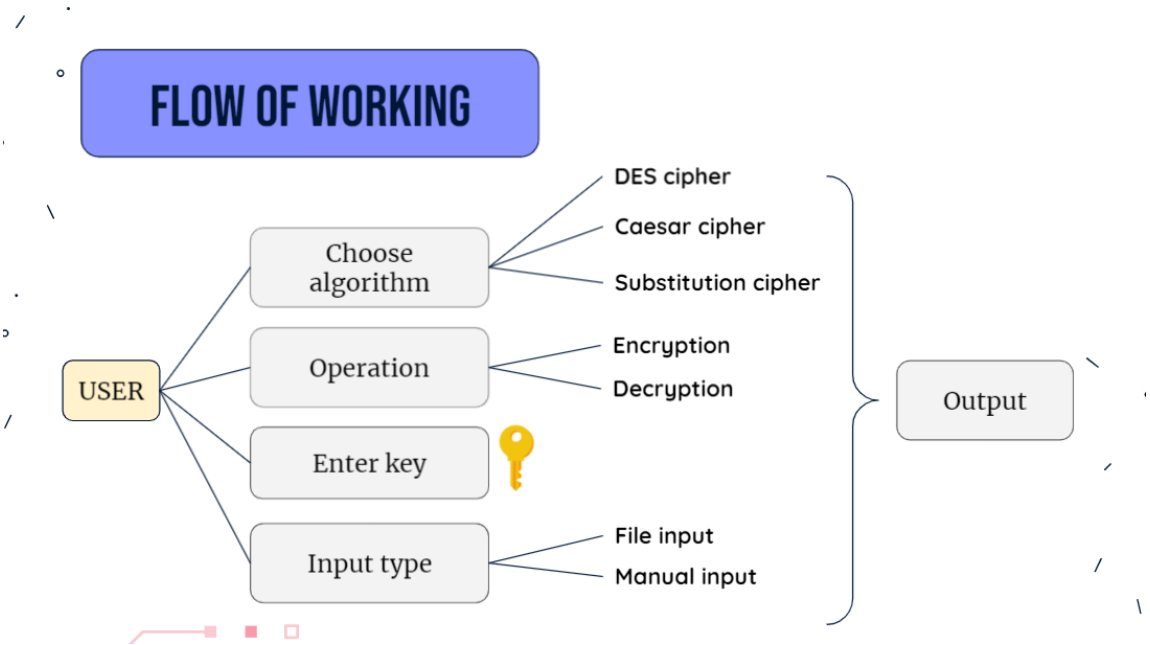
Following industry principles, Cipher-It has been developed to implement a very powerful encryption & decryption algorithm - DES (data encryption standard) as well as some basic algorithms such as Substitution and Caesar cipher.

PROBLEM STATEMENT

“Cipher It” is a Java based application which operates on both console and via GUI, to encrypt and decrypt text data, entered manually or present in a text file, using 3 different algorithms

INTRODUCTION

Java is a high-level, class-based, object-oriented programming language that is designed to have as few implementation dependencies as possible. It is a general-purpose programming language intended to let application developers *write once, run anywhere*, meaning that compiled Java code can run on all platforms that support Java without the need for recompilation. Java applications are typically compiled to bytecode that can run on any Java virtual machine (JVM) regardless of the underlying computer architecture.



Cipher-It was designed as follows

- User gets to decide if they want to encrypt or decrypt their text
- User gets the choice to choose the algorithm they want
- User is allowed to input text
- User enters a key based on the algorithm chosen
- Voila! Cipher It will give the output, according to the input parameters in the snap of a finger

OVERVIEW OF THE PROJECT

Index

Central class which accepts data from the console

CipherIT

Central class which accepts data from the GUI

GUI Files

FirstScreen

The first GUI frame that you see at the start which accepts Cryption and Algorithm used

Inputs

The second GUI frame which accepts the key, the type of input and the input data

Manual

Accepts data from the keyboard from user

OutputScreen

Last Frame which displays Output and key

Cipher

Interface for a basic Cipher structure, has the abstract methods “encrypt” and “decrypt”. Abstract methods must be implemented by the deriving classes

DES_P Package

DES

DES class implements Cipher interface, applies DES algorithm

and provides implementation for encrypt & decrypt methods

HexEntries

Converting Hexadecimal values to ASCII strings and vice versa

KeyGenerator

Generates 16-bit long hexadecimal key for encryption of DES

Parser

Provides implementation of all the logic requires for DES algorithm

Tokens

Stores all the constants required for DES algorithm

Caesar

Applies Caesar Cipher

Substitution

Applies Substitution Cipher based on code.txt

TOOLS & CONCEPTS USED

TOOLS USED :

- IntelliJ
- BlueJ
- Github
- Netbeans
- Jgrasp
- Vs Code

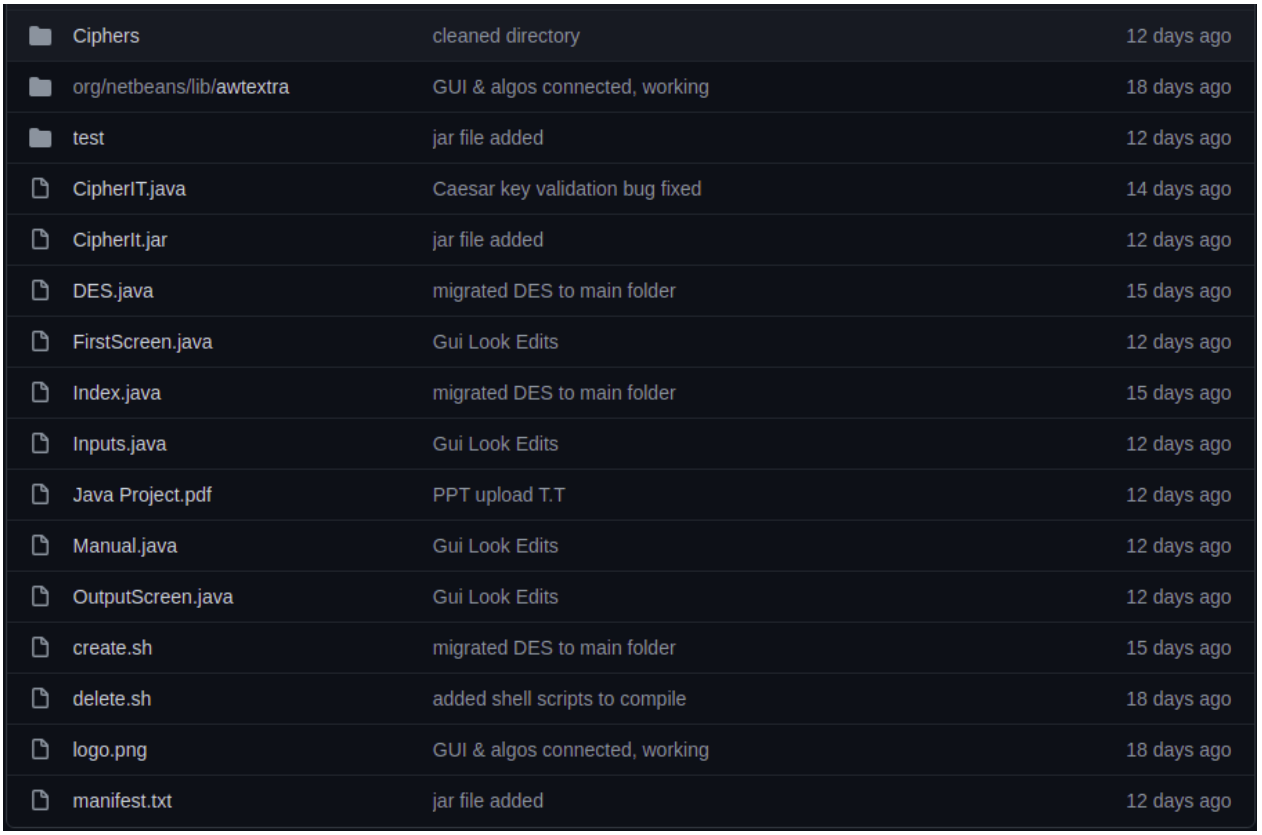
CONCEPTS USED :

- Packages
- Interfaces
- Exception handling
- File handling
- Multithreading
- Collection Framework
- Swings

IMPLEMENTATION

Since Code files are too elaborate, you can find them in the github link provided below

[GitHub Repository - Project Code]



Ciphers	cleaned directory	12 days ago
org/netbeans/lib/awtextra	GUI & algos connected, working	18 days ago
test	jar file added	12 days ago
CipherIT.java	Caesar key validation bug fixed	14 days ago
CipherIt.jar	jar file added	12 days ago
DES.java	migrated DES to main folder	15 days ago
FirstScreen.java	Gui Look Edits	12 days ago
Index.java	migrated DES to main folder	15 days ago
Inputs.java	Gui Look Edits	12 days ago
Java Project.pdf	PPT upload T.T	12 days ago
Manual.java	Gui Look Edits	12 days ago
OutputScreen.java	Gui Look Edits	12 days ago
create.sh	migrated DES to main folder	15 days ago
delete.sh	added shell scripts to compile	18 days ago
logo.png	GUI & algos connected, working	18 days ago
manifest.txt	jar file added	12 days ago

RESULT & OUTPUT

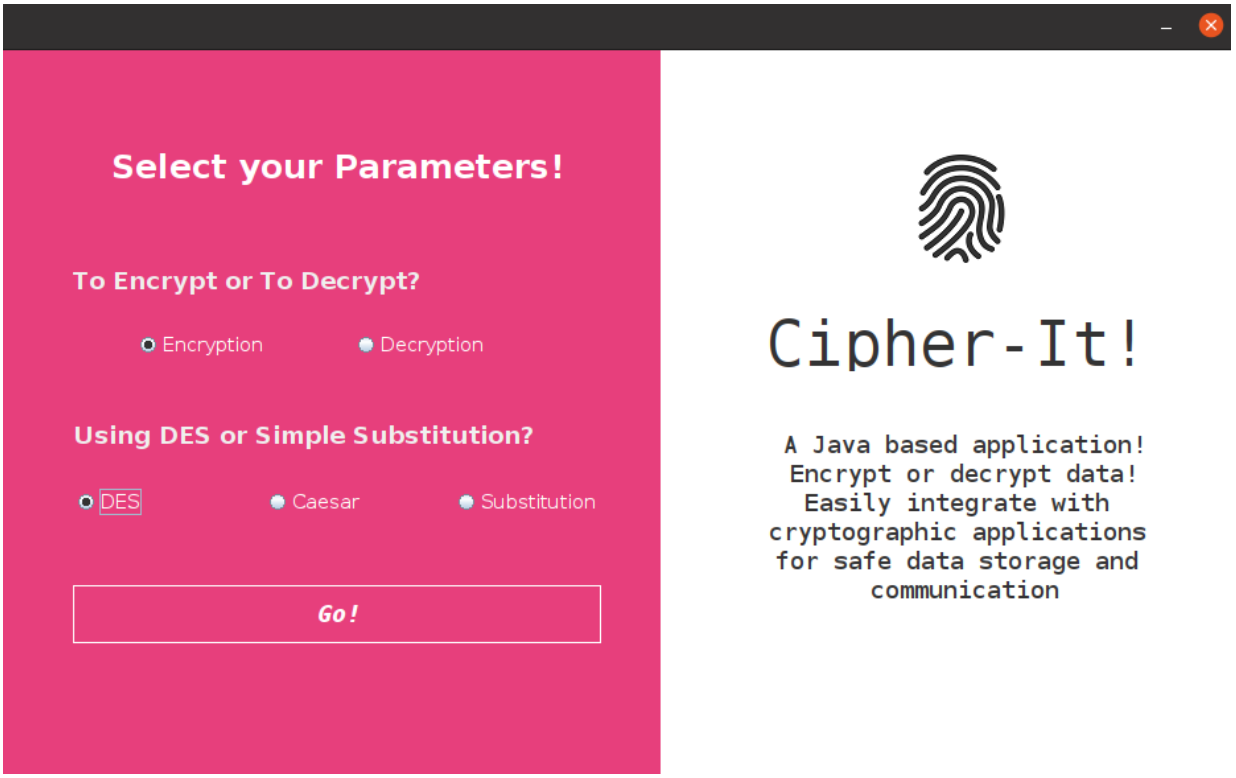


Fig 1: First GUI Screen

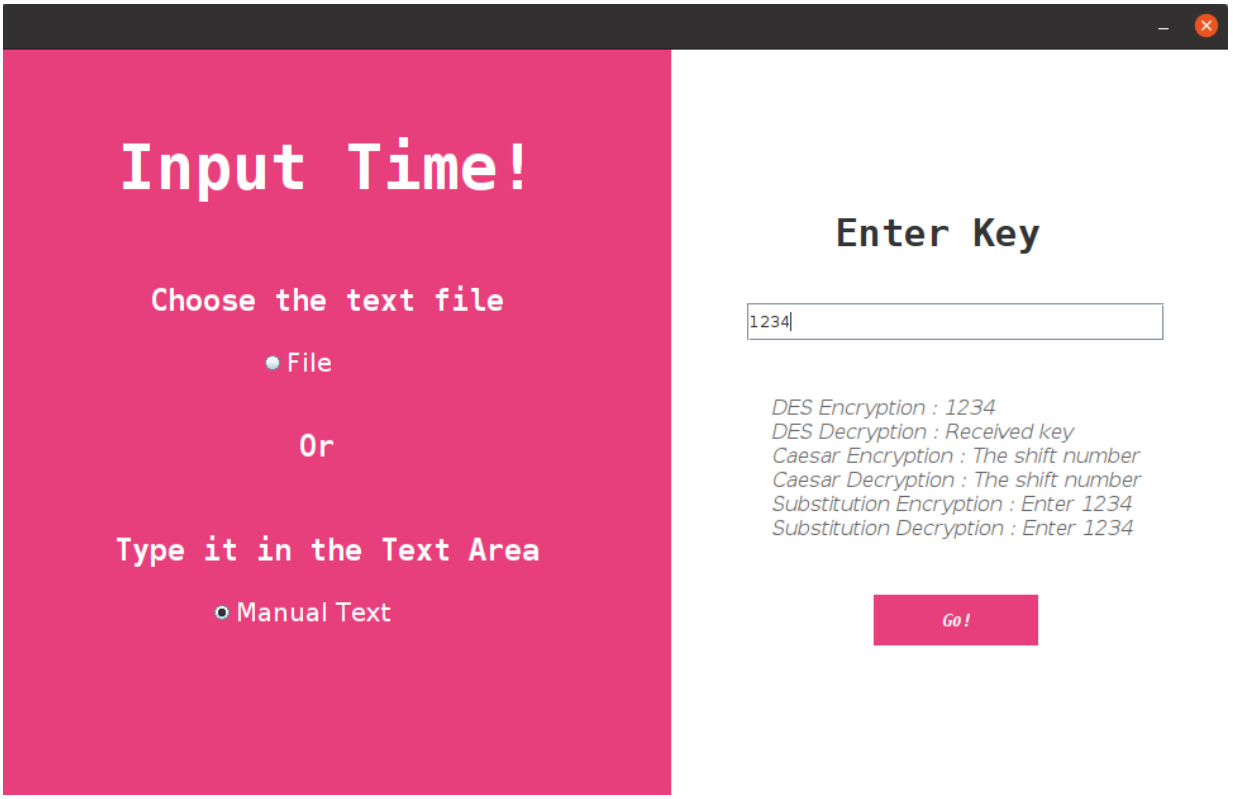


Fig 2: Second GUI Screen

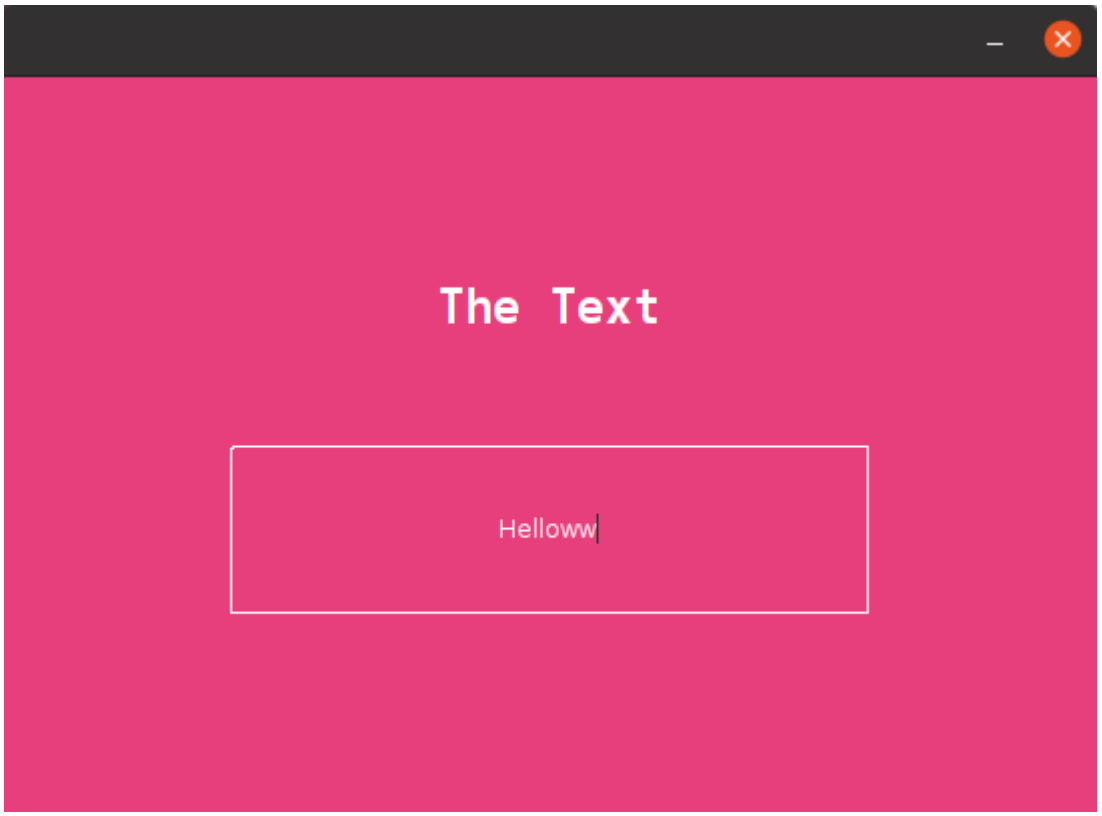


Fig 3: Pop-up to Enter text Manually

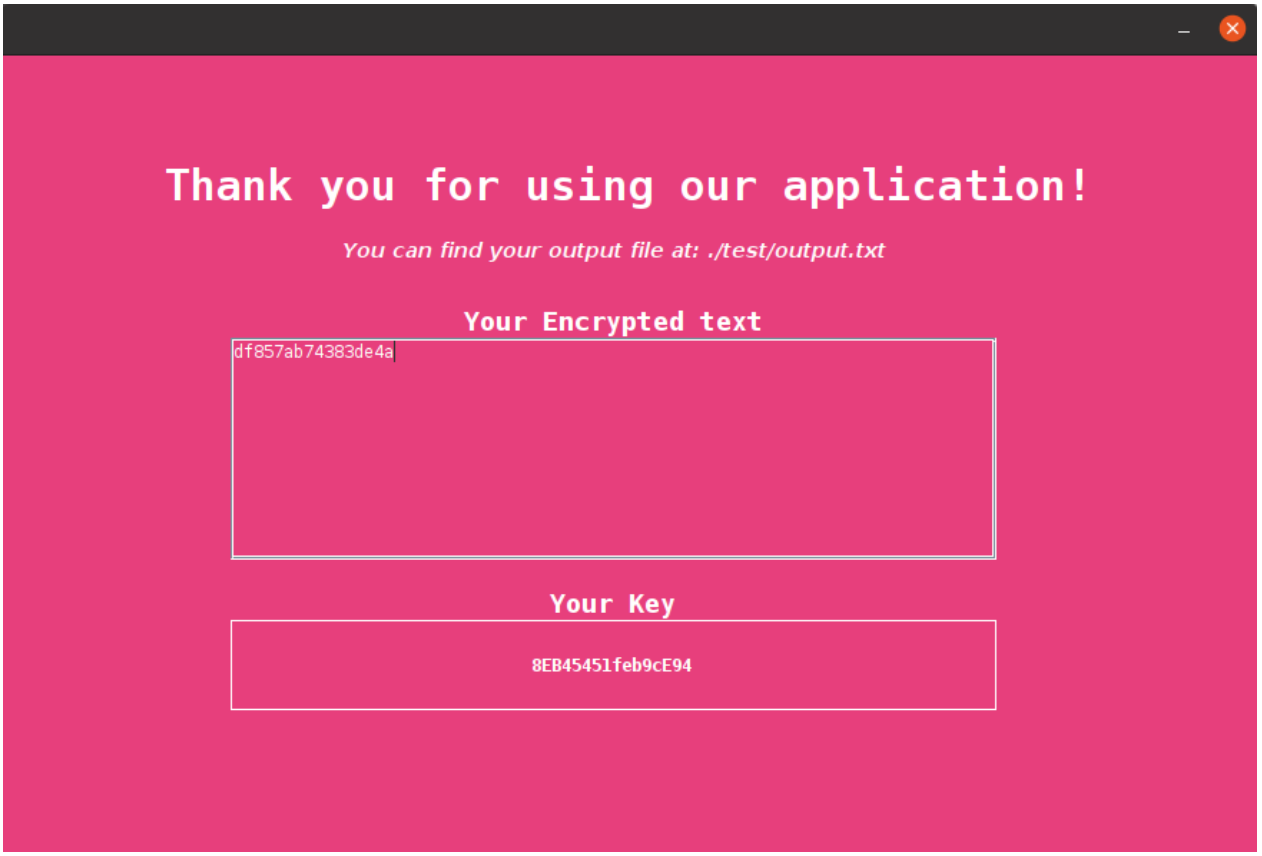


Fig 4: Output GUI Screen

```
Choose how you provide input
        1) console
        2) file input
        3) exit
Enter your choice : 1

Enter the text : Hello world

The input string is : Hello world

Choose which cipher do you want to use
        1) substitution cipher
        2) caesar cipher
        3) DES cipher
        4) exit
Enter your choice : 2

Hold up, what do you want to do though?
        1) encrypt
        2) decrypt
        3) exit
Enter your choice : 1

Enter the shift value: 5
The encrypted string: Mjqqt btwqi

Thank you for using our application
```

Fig 5: Console Output

REFERENCES

- https://netbeans.apache.org/
- https://en.wikipedia.org/wiki/Data_Encryption_Standard
- https://en.wikipedia.org/wiki/Cipher
- https://en.wikipedia.org/wiki/Substitution_cipher
- https://docs.oracle.com/javase/tutorial/deployment/jar/basicsindex.html
- Java The Complete Reference - Herbert Schildt