TUGAS 1

KEAMANAN KOMPUTER/KRIPTOGRAFI

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NIM : 202018

KELAS : 5TKKO-E

FAKULTAS TEKNIK

PROGRAM STUDI TEKNIK INFORMATIKA

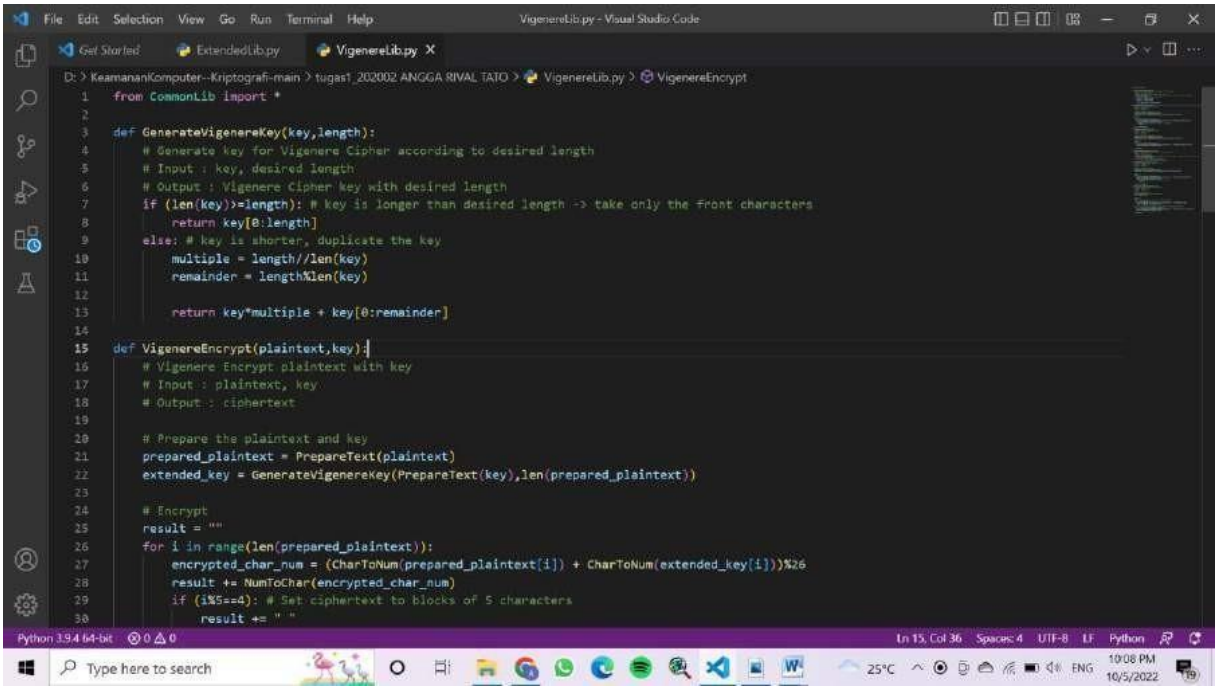
2022/2023

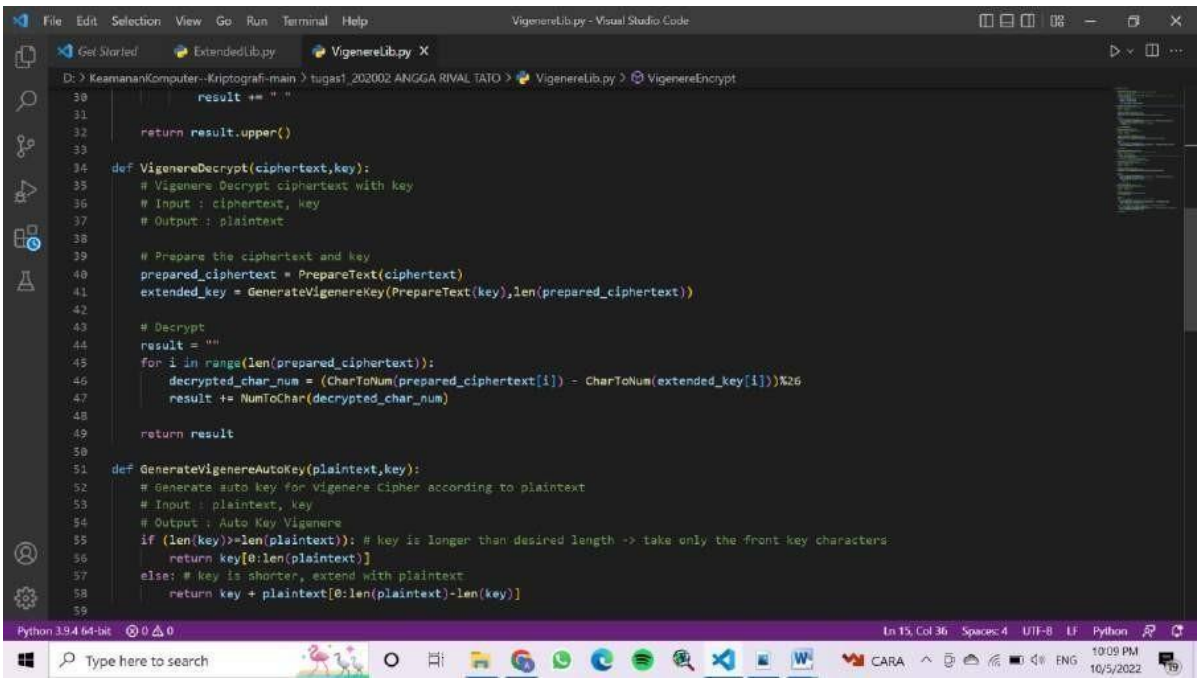
DAFTAR ISI

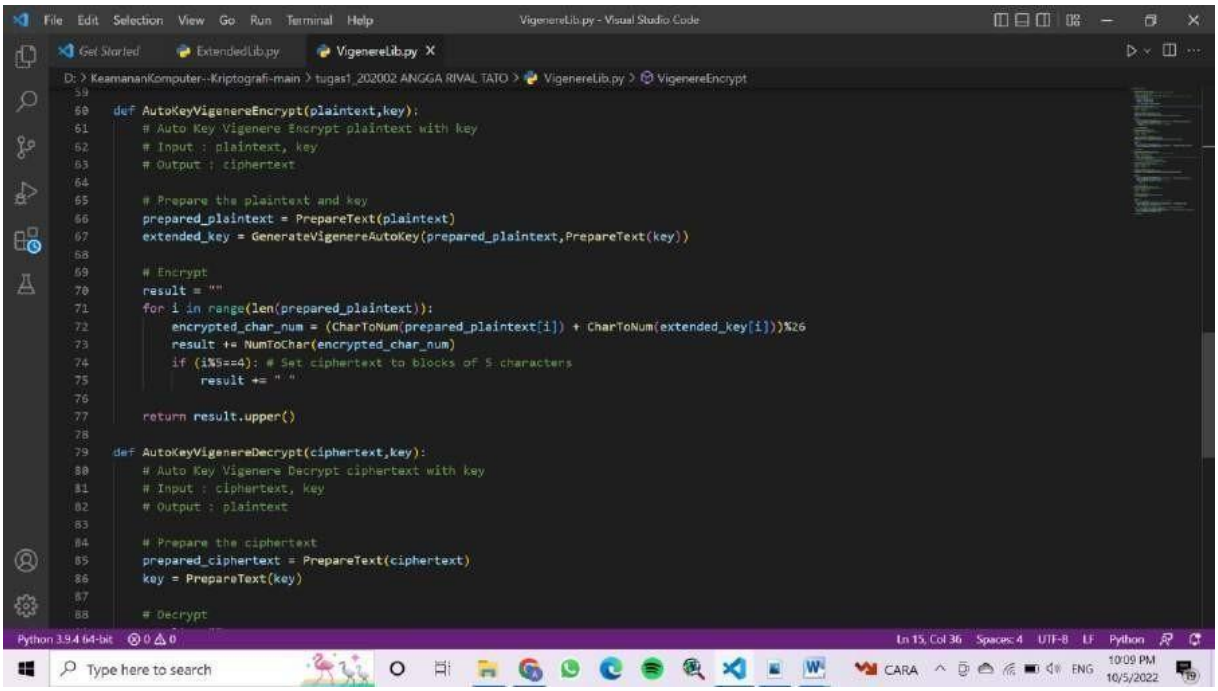
1. Source Code Program

Pembuatan source code di lakukan dalam bahasa python. Pembuatan GUI di lakukan dalam tkinter yang terdapat pada bahasa perograman python. Terdapat 5 file yang ber extention py (python) yang akan di build pada text editor visual studio code.

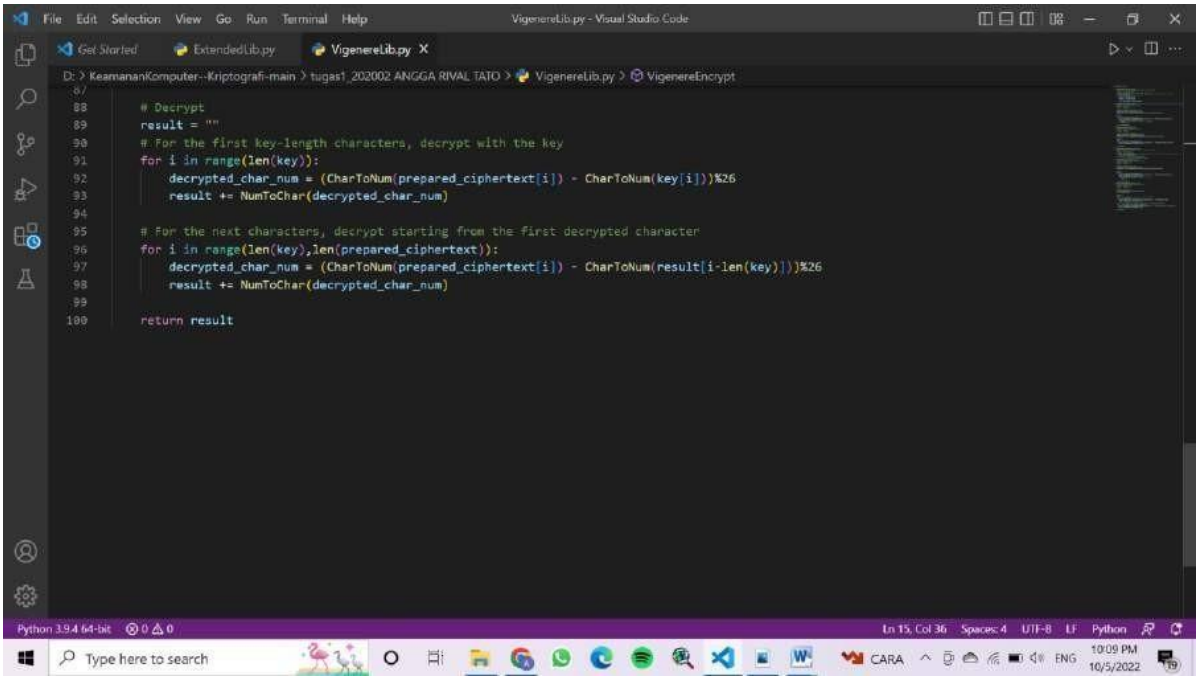
Vigenere Cipher.py





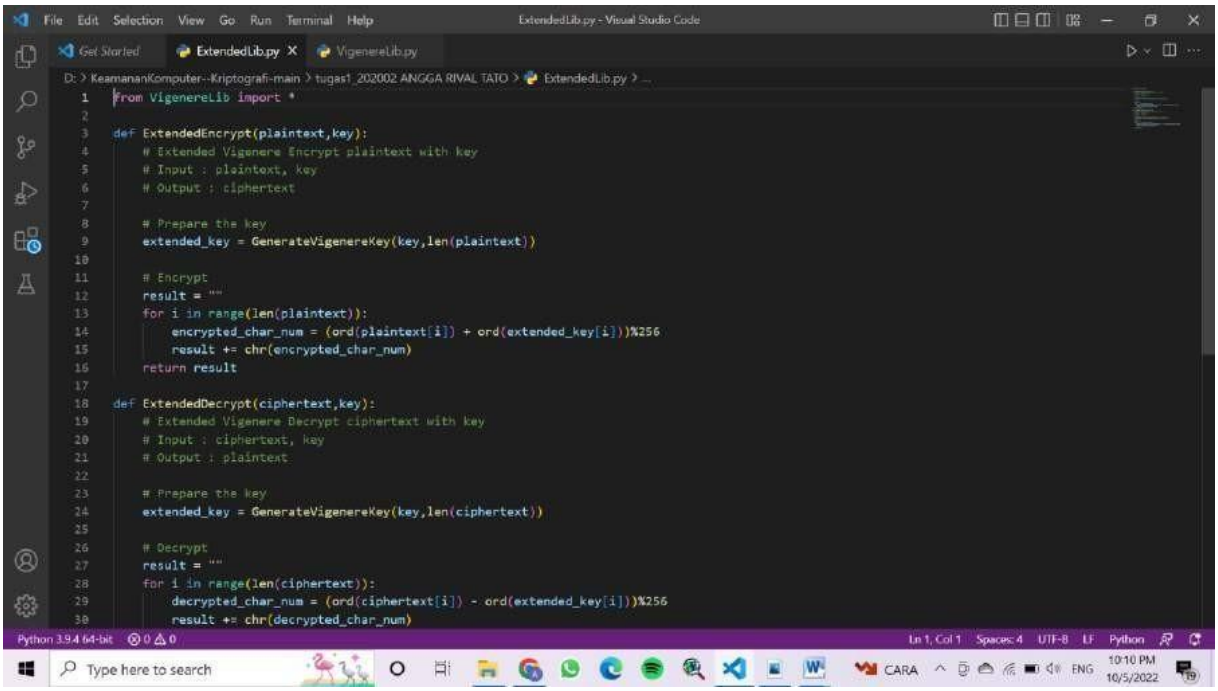


```
def AutoKeyVigenereEncrypt(plaintext,key):
    # Auto Key Vigenere Encrypt plaintext with key
    # Input : plaintext, key
    # Output : ciphertext

    # Prepare the plaintext and key
    prepared_plaintext = PrepareText(plaintext)
    extended_key = GenerateVigenereAutoKey(prepared_plaintext,PrepareText(key))

    # Encrypt
    result = ""
    for i in range(len(prepared_plaintext)):
        encrypted_char_num = (CharToNum(prepared_plaintext[i]) + CharToNum(extended_key[i]))%26
        result += NumToChar(encrypted_char_num)
        if (i%5==4): # Set ciphertext to blocks of 5 characters
            result += " "

    return result.upper()

def AutoKeyVigenereDecrypt(ciphertext,key):
    # Auto Key Vigenere Decrypt ciphertext with key
    # Input : ciphertext, key
    # Output : plaintext

    # Prepare the ciphertext
    prepared_ciphertext = PrepareText(ciphertext)
    key = PrepareText(key)

    # Decrypt
```



```
    # Decrypt
    result = ""
    # For the first key-length characters, decrypt with the key
    for i in range(len(key)):
        decrypted_char_num = (CharToNum(prepared_ciphertext[i]) - CharToNum(key[i]))%26
        result += NumToChar(decrypted_char_num)

    # For the next characters, decrypt starting from the first decrypted character
    for i in range(len(key),len(prepared_ciphertext)):
        decrypted_char_num = (CharToNum(prepared_ciphertext[i]) - CharToNum(result[i-len(key)]))%26
        result += NumToChar(decrypted_char_num)

    return result
```

Extended vigenere cipher.py


File Edit Selection View Go Run Terminal Help
ExtendedLib.py - Visual Studio Code
Get Started
ExtendedLib.py
VigenereLib.py
D: > KeamananKomputer--Kriptografi-main > tugas1_202002 ANGGA RIVAL TATO > ExtendedLib.py > ...
from VigenereLib import *
def ExtendedEncrypt(plaintext,key):
# Extended Vigenere Encrypt plaintext with key
# Input : plaintext, key
# Output : ciphertext
# Prepare the key
extended_key = GenerateVigenereKey(key,len(plaintext))
# Encrypt
result = ""
for i in range(len(plaintext)):
encrypted_char_num = (ord(plaintext[i]) + ord(extended_key[i]))%256
result += chr(encrypted_char_num)
return result
def ExtendedDecrypt(ciphertext,key):
# Extended Vigenere Decrypt ciphertext with key
# Input : ciphertext, key
# Output : plaintext
# Prepare the key
extended_key = GenerateVigenereKey(key,len(ciphertext))
# Decrypt
result = ""
for i in range(len(ciphertext)):
decrypted_char_num = (ord(ciphertext[i]) - ord(extended_key[i]))%256
result += chr(decrypted_char_num)
Python 3.9.4 64-bit
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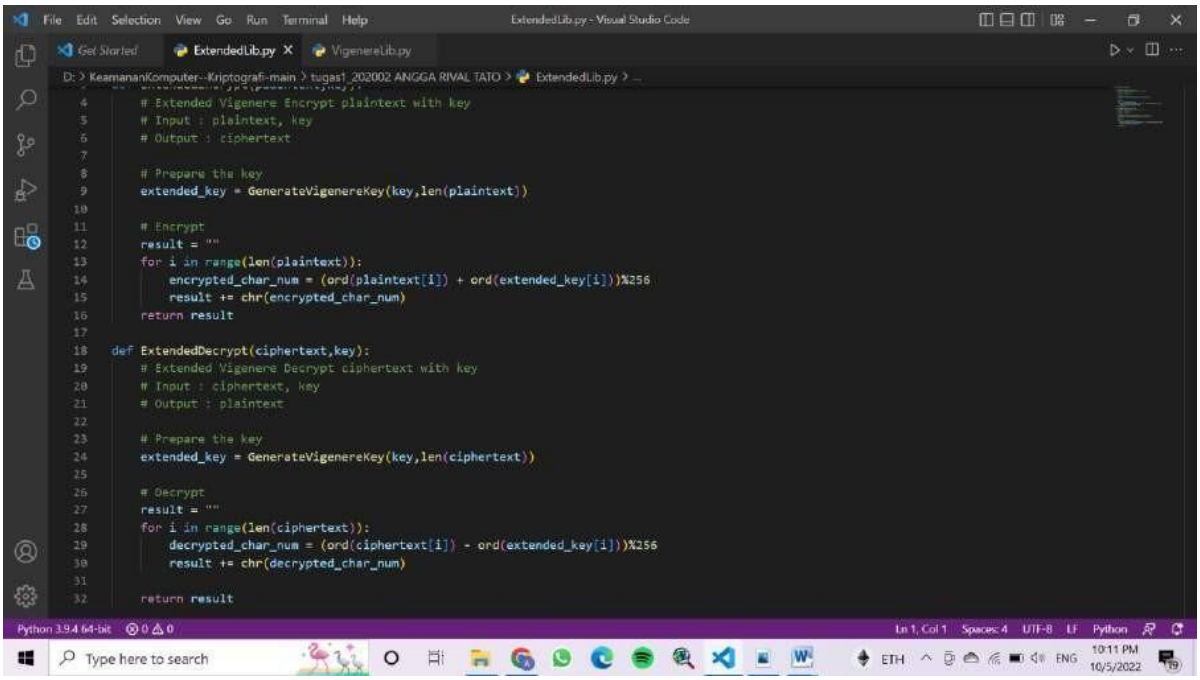
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# Extended Vigenere Encrypt plaintext with key
# Input : plaintext, key
# Output : ciphertext
# Prepare the key
extended_key = GenerateVigenereKey(key,len(plaintext))
# Encrypt
result = ""
for i in range(len(plaintext)):
encrypted_char_num = (ord(plaintext[i]) + ord(extended_key[i]))%256
result += chr(encrypted_char_num)
return result
def ExtendedDecrypt(ciphertext,key):
# Extended Vigenere Decrypt ciphertext with key
# Input : ciphertext, key
# Output : plaintext
# Prepare the key
extended_key = GenerateVigenereKey(key,len(ciphertext))
# Decrypt
result = ""
for i in range(len(ciphertext)):
decrypted_char_num = (ord(ciphertext[i]) - ord(extended_key[i]))%256
result += chr(decrypted_char_num)
return result
Python 3.9.4 64-bit
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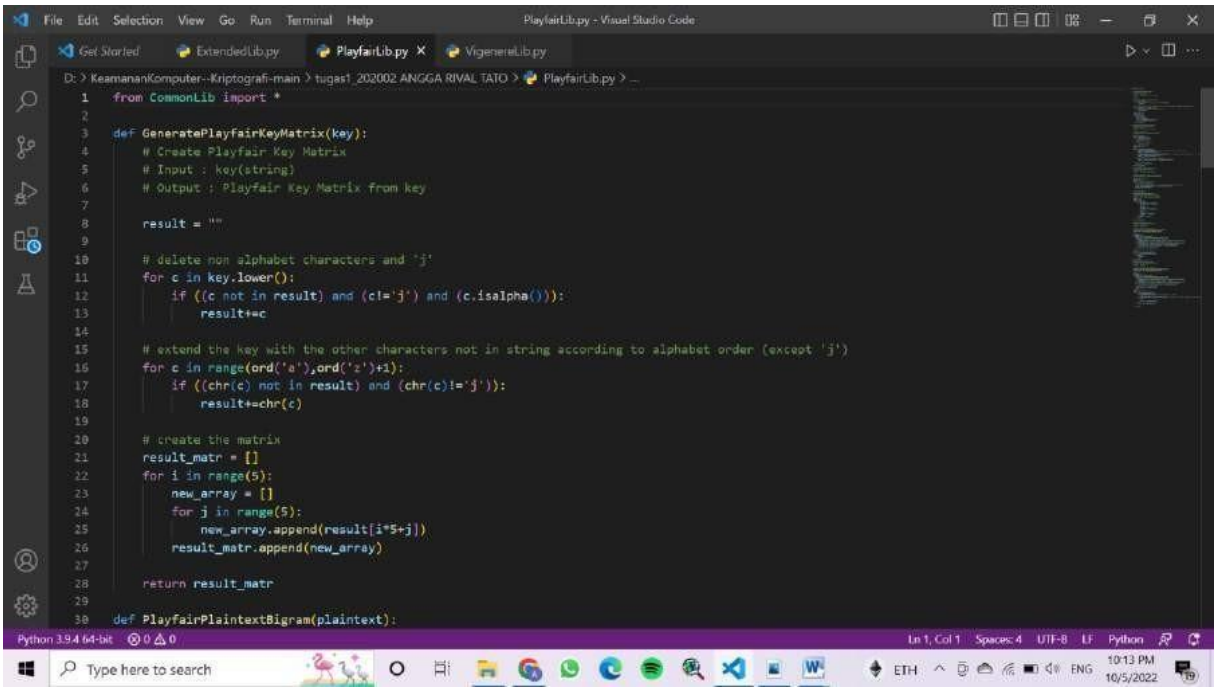
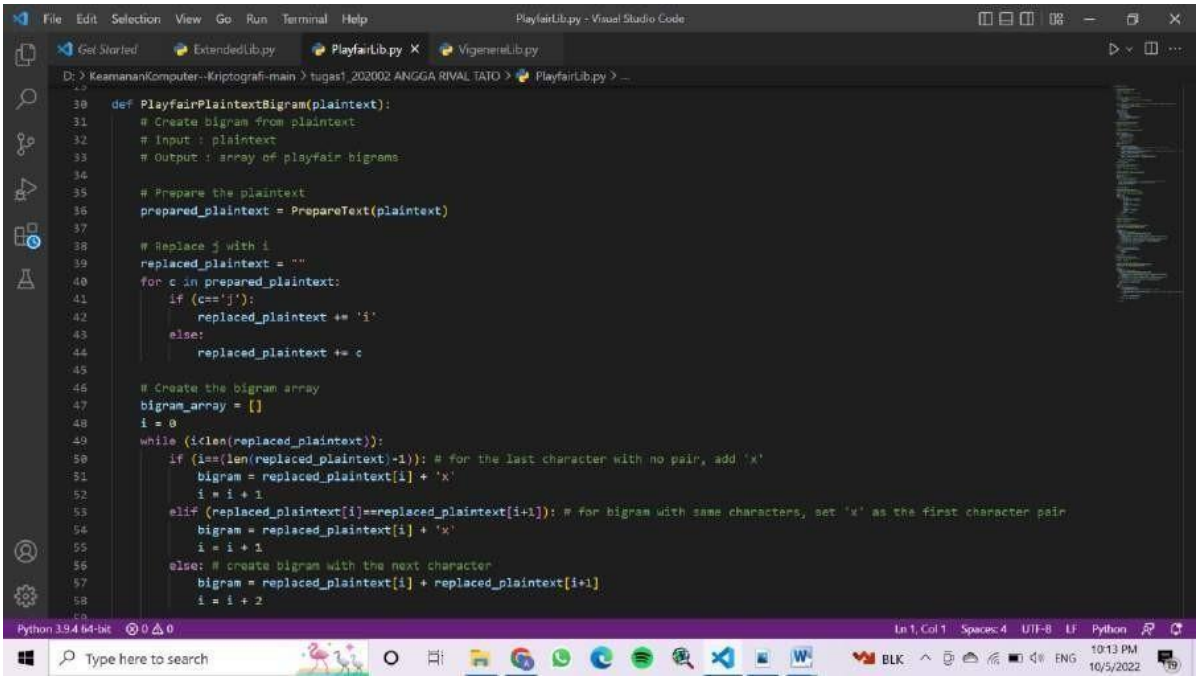
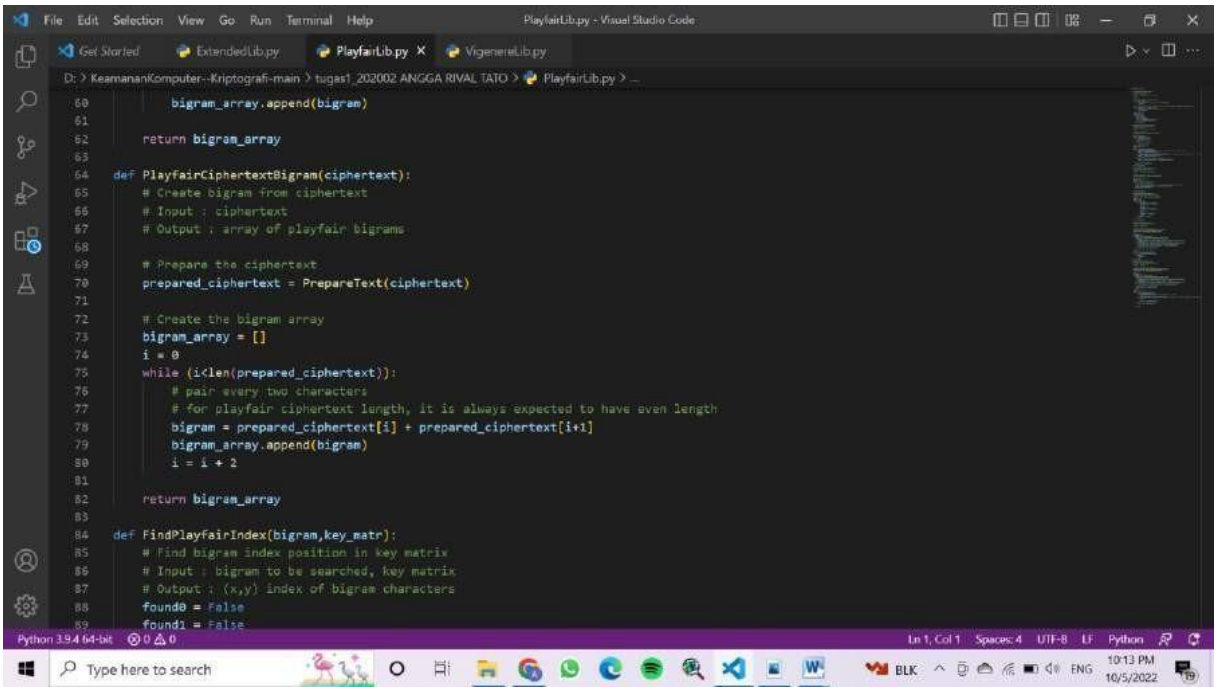
Playfair cipher.py



```python
from CommonLib import *

def GeneratePlayfairKeyMatrix(key):
    # Create Playfair Key Matrix
    # Input : key(string)
    # Output : Playfair Key Matrix from key

    result = ""

    # delete non alphabet characters and 'j'
    for c in key.lower():
        if ((c not in result) and (c!='j') and (c.isalpha())):
            result+=c

    # extend the key with the other characters not in string according to alphabet order (except 'j')
    for c in range(ord('a'),ord('z')+1):
        if ((chr(c) not in result) and (chr(c)!='j')):
            result+=chr(c)

    # create the matrix
    result_matr = []
    for i in range(5):
        new_array = []
        for j in range(5):
            new_array.append(result[i*5+j])
        result_matr.append(new_array)

    return result_matr

def PlayfairPlaintextBigram(plaintext):
```



```python
def PlayfairPlaintextBigram(plaintext):
    # Create bigram from plaintext
    # Input : plaintext
    # Output : array of playfair bigrams

    # Prepare the plaintext
    prepared_plaintext = PrepareText(plaintext)

    # Replace j with i
    replaced_plaintext = ""
    for c in prepared_plaintext:
        if (c=='j'):
            replaced_plaintext += 'i'
        else:
            replaced_plaintext += c

    # Create the bigram array
    bigram_array = []
    i = 0
    while (i<len(replaced_plaintext)):
        if (i==(len(replaced_plaintext)-1)): # for the last character with no pair, add 'x'
            bigram = replaced_plaintext[i] + 'x'
            i = i + 1
        elif (replaced_plaintext[i]==replaced_plaintext[i+1]): # for bigram with same characters, set 'x' as the first character pair
            bigram = replaced_plaintext[i] + 'x'
            i = i + 1
        else: # create bigram with the next character
            bigram = replaced_plaintext[i] + replaced_plaintext[i+1]
            i = i + 2
```


File Edit Selection View Go Run Terminal Help
PlayfairLib.py - Visual Studio Code
Get Started
ExtendedLib.py
PlayfairLib.py
VigenereLib.py
D: > KeamananKomputer--Kriptografi-main > tugas1_202002 ANGGA RIVAL TATO > PlayfairLib.py > ...
bigram_array.append(bigram)
return bigram_array
def PlayfairCiphertextBigram(ciphertext):
# Create bigram from ciphertext
# Input : ciphertext
# Output : array of playfair bigrams
# Prepare the ciphertext
prepared_ciphertext = PrepareText(ciphertext)
# Create the bigram array
bigram_array = []
i = 0
while (i<len(prepared_ciphertext)):
# pair every two characters
# for playfair ciphertext length, it is always expected to have even length
bigram = prepared_ciphertext[i] + prepared_ciphertext[i+1]
bigram_array.append(bigram)
i = i + 2
return bigram_array
def FindPlayfairIndex(bigram,key_matr):
# Find bigram index position in key matrix
# Input : bigram to be searched, key matrix
# Output : (x,y) index of bigram characters
found0 = False
found1 = False
Python 3.9.4 64-bit
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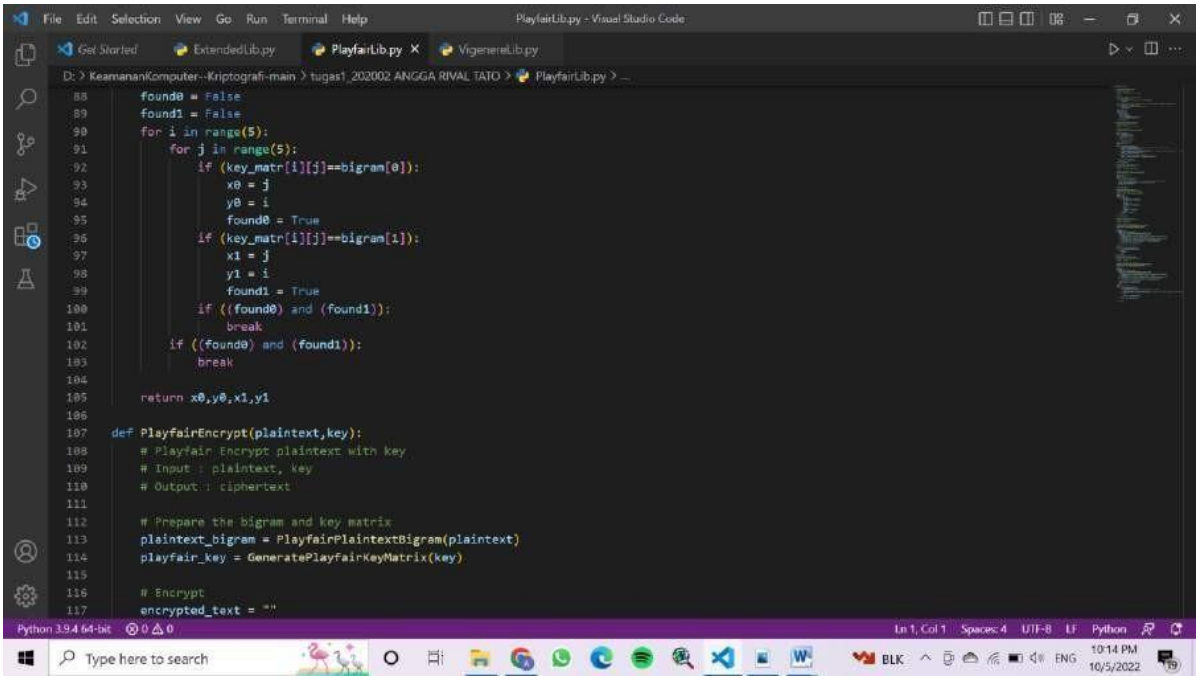
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VigenereLib.py
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found0 = False
found1 = False
for i in range(5):
for j in range(5):
if (key_matr[i][j]==bigram[0]):
x0 = j
y0 = i
found0 = True
if (key_matr[i][j]==bigram[1]):
x1 = j
y1 = i
found1 = True
if ((found0) and (found1)):
break
if ((found0) and (found1)):
break
return x0,y0,x1,y1
def PlayfairEncrypt(plaintext,key):
# Playfair Encrypt plaintext with key
# Input : plaintext, key
# Output : ciphertext
# Prepare the bigram and key matrix
plaintext_bigram = PlayfairPlaintextBigram(plaintext)
playfair_key = GeneratePlayfairKeyMatrix(key)
# Encrypt
encrypted_text = ""
Python 3.9.4 64-bit
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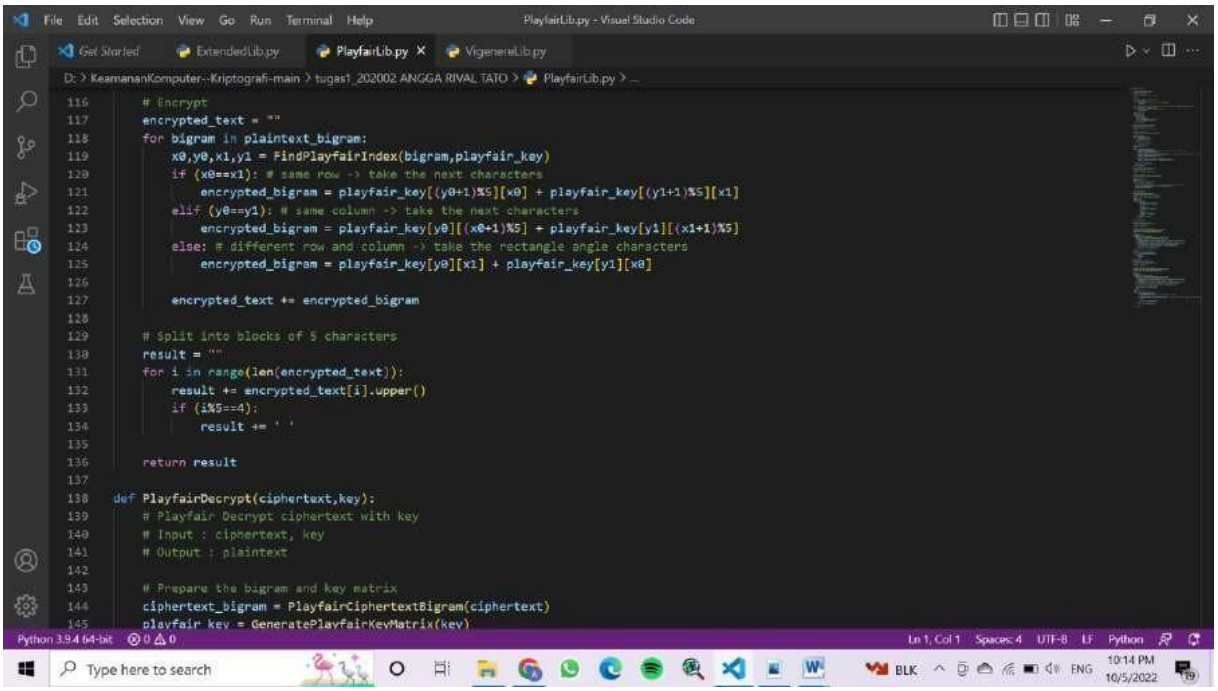
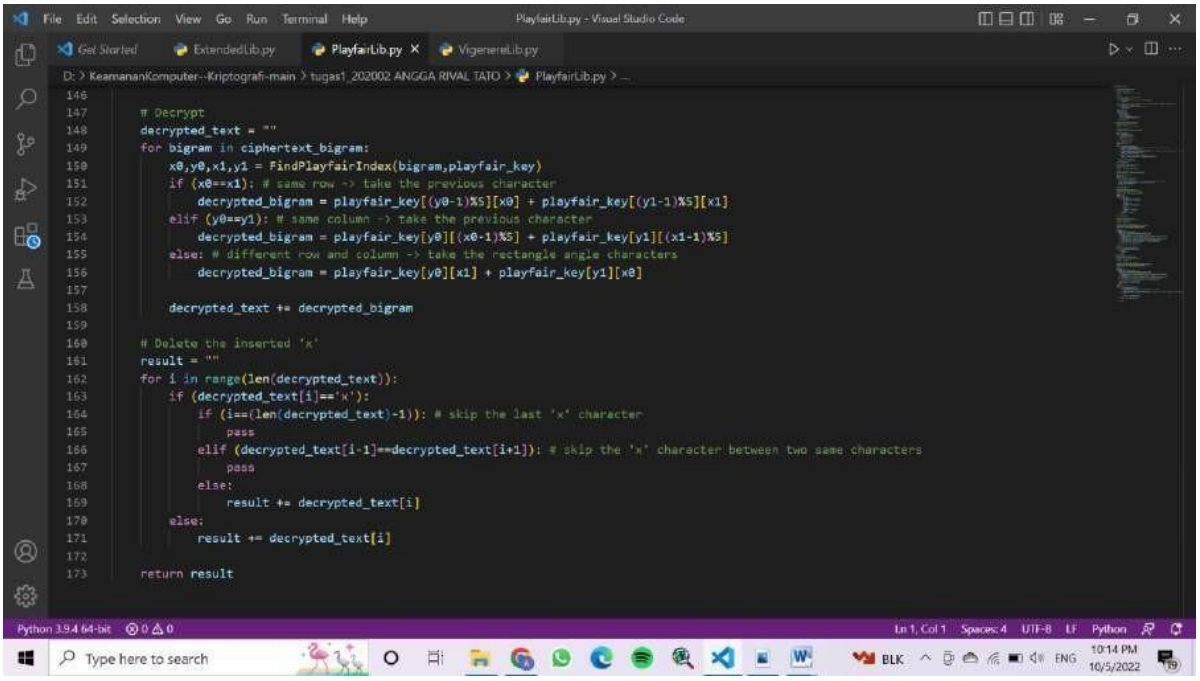
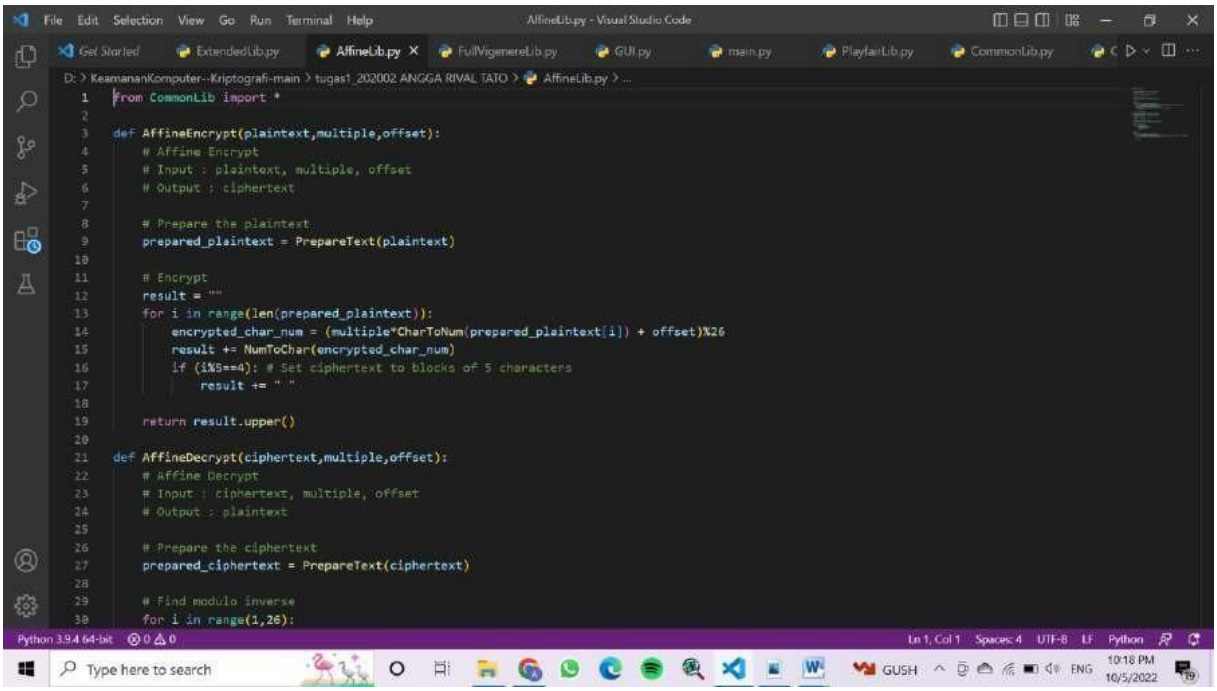
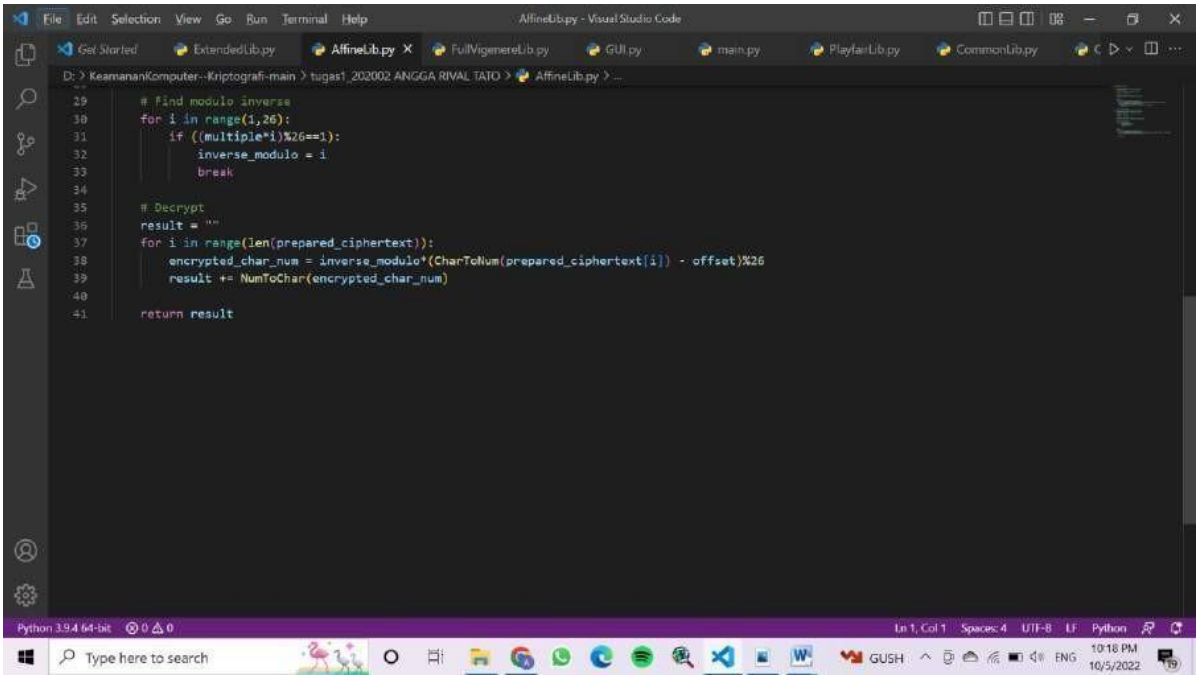


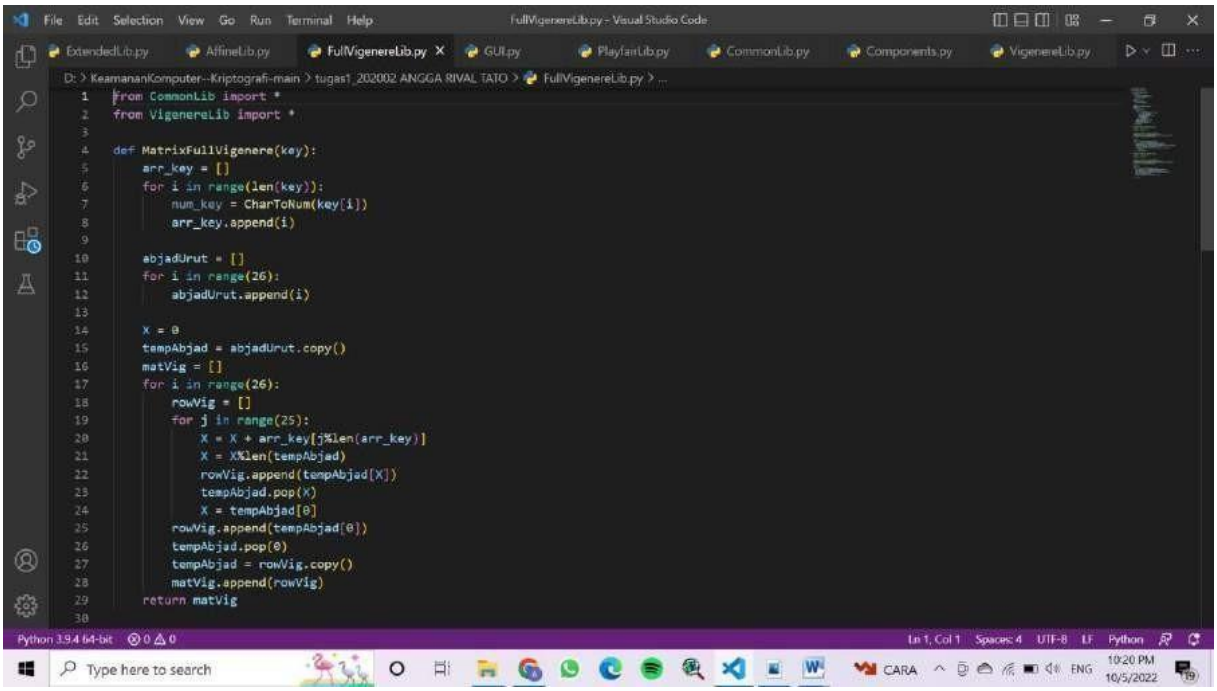


Enigma cipher.py





One-time pad.py


File Edit Selection View Go Run Terminal Help
FullVigenereLib.py - Visual Studio Code
ExtendedLib.py
AffineLib.py
FullVigenereLib.py
GUI.py
PlayfairLib.py
CommonLib.py
Components.py
VigenereLib.py
D: > KeamananKomputer--Kriptografi-main > tugas1_202002 ANGGA RIVAL TATO > FullVigenereLib.py > ...
from CommonLib import *
from VigenereLib import *
def MatrixFullVigenere(key):
arr_key = []
for i in range(len(key)):
num_key = CharToNum(key[i])
arr_key.append(i)
abjadUrut = []
for i in range(26):
abjadUrut.append(i)
X = 0
tempAbjad = abjadUrut.copy()
matVig = []
for i in range(26):
rowVig = []
for j in range(25):
X = X + arr_key[j%len(arr_key)]
X = X%len(tempAbjad)
rowVig.append(tempAbjad[X])
tempAbjad.pop(X)
X = tempAbjad[0]
rowVig.append(tempAbjad[0])
tempAbjad.pop(0)
tempAbjad = rowVig.copy()
matVig.append(rowVig)
return matVig
Python 3.9.4 64-bit
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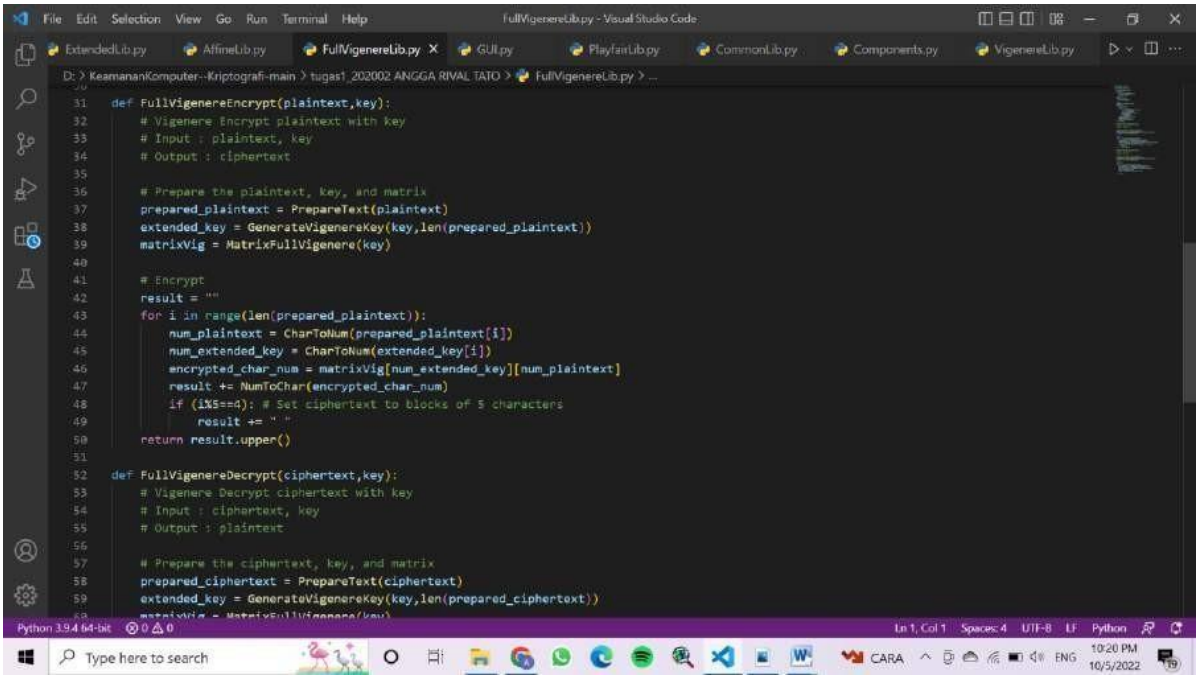
File Edit Selection View Go Run Terminal Help
FullVigenereLib.py - Visual Studio Code
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CommonLib.py
Components.py
VigenereLib.py
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def FullVigenereEncrypt(plaintext,key):
# Vigenere Encrypt plaintext with key
# Input : plaintext, key
# Output : ciphertext
# Prepare the plaintext, key, and matrix
prepared_plaintext = PrepareText(plaintext)
extended_key = GenerateVigenereKey(key,len(prepared_plaintext))
matrixVig = MatrixFullVigenere(key)
# Encrypt
result = ""
for i in range(len(prepared_plaintext)):
num_plaintext = CharToNum(prepared_plaintext[i])
num_extended_key = CharToNum(extended_key[i])
encrypted_char_num = matrixVig[num_extended_key][num_plaintext]
result += NumToChar(encrypted_char_num)
if (i%5==4): # Set ciphertext to blocks of 5 characters
result += " "
return result.upper()
def FullVigenereDecrypt(ciphertext,key):
# Vigenere Decrypt ciphertext with key
# Input : ciphertext, key
# Output : plaintext
# Prepare the ciphertext, key, and matrix
prepared_ciphertext = PrepareText(ciphertext)
extended_key = GenerateVigenereKey(key,len(prepared_ciphertext))
Python 3.9.4 64-bit
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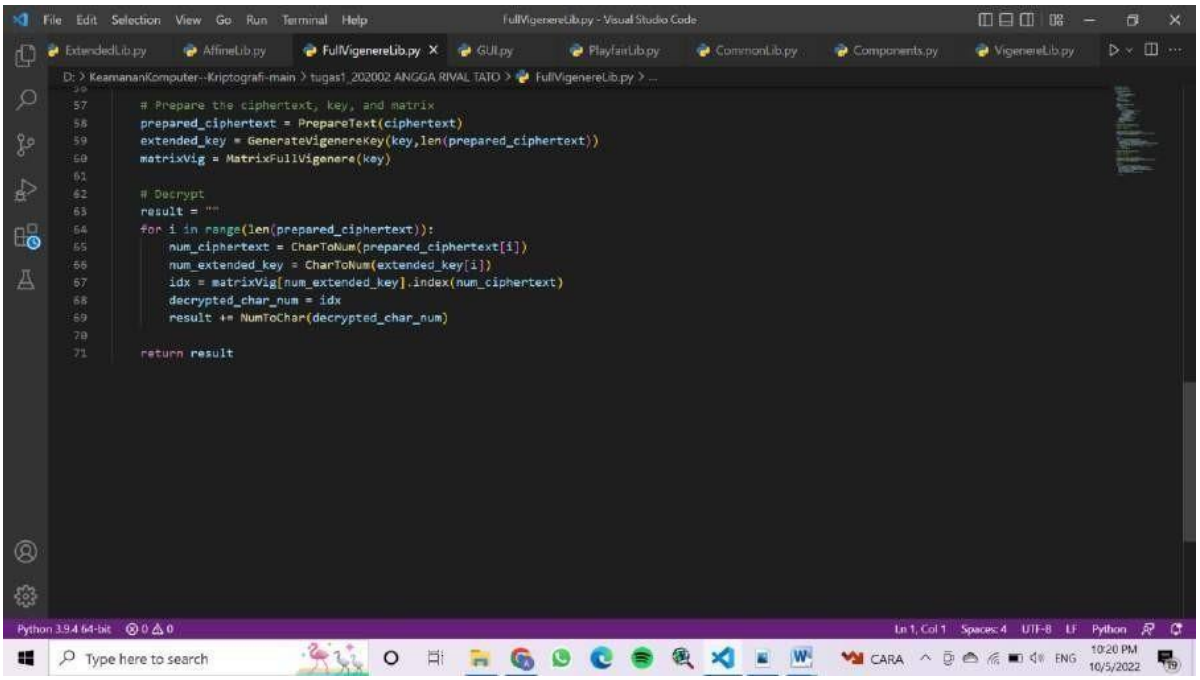
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FullVigenereLib.py - Visual Studio Code
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VigenereLib.py
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# Prepare the ciphertext, key, and matrix
prepared_ciphertext = PrepareText(ciphertext)
extended_key = GenerateVigenereKey(key,len(prepared_ciphertext))
matrixVig = MatrixFullVigenere(key)
# Decrypt
result = ""
for i in range(len(prepared_ciphertext)):
num_ciphertext = CharToNum(prepared_ciphertext[i])
num_extended_key = CharToNum(extended_key[i])
idx = matrixVig[num_extended_key].index(num_ciphertext)
decrypted_char_num = idx
result += NumToChar(decrypted_char_num)
return result
Python 3.9.4 64-bit
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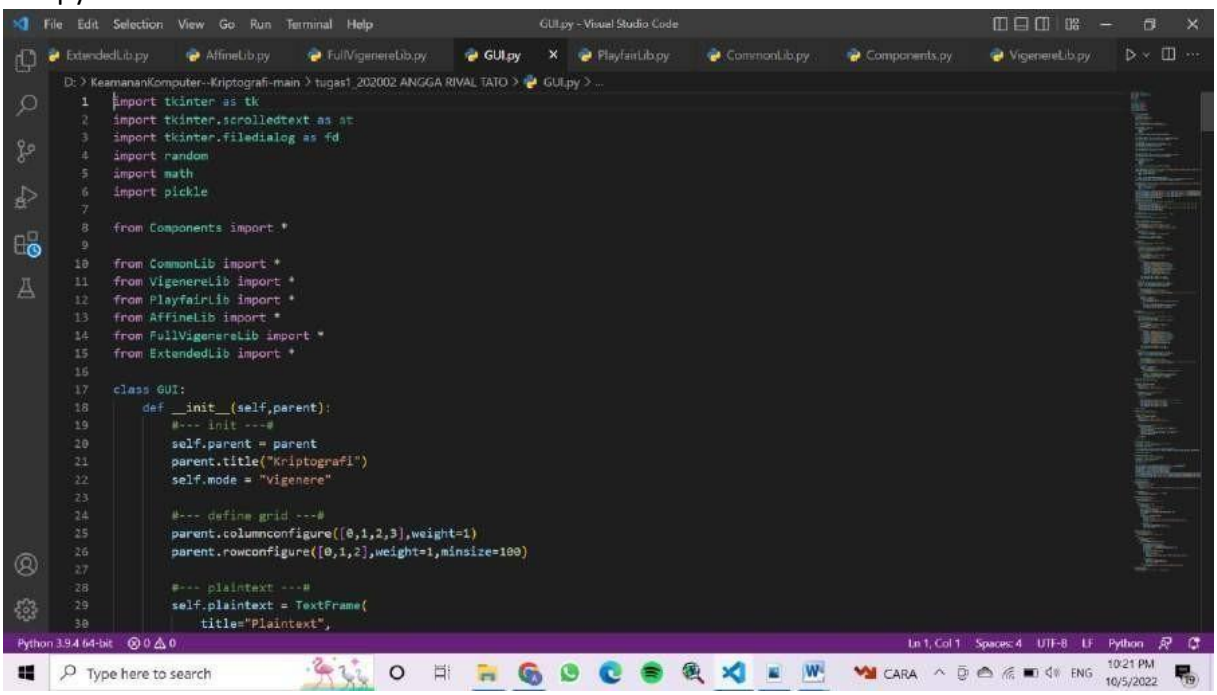
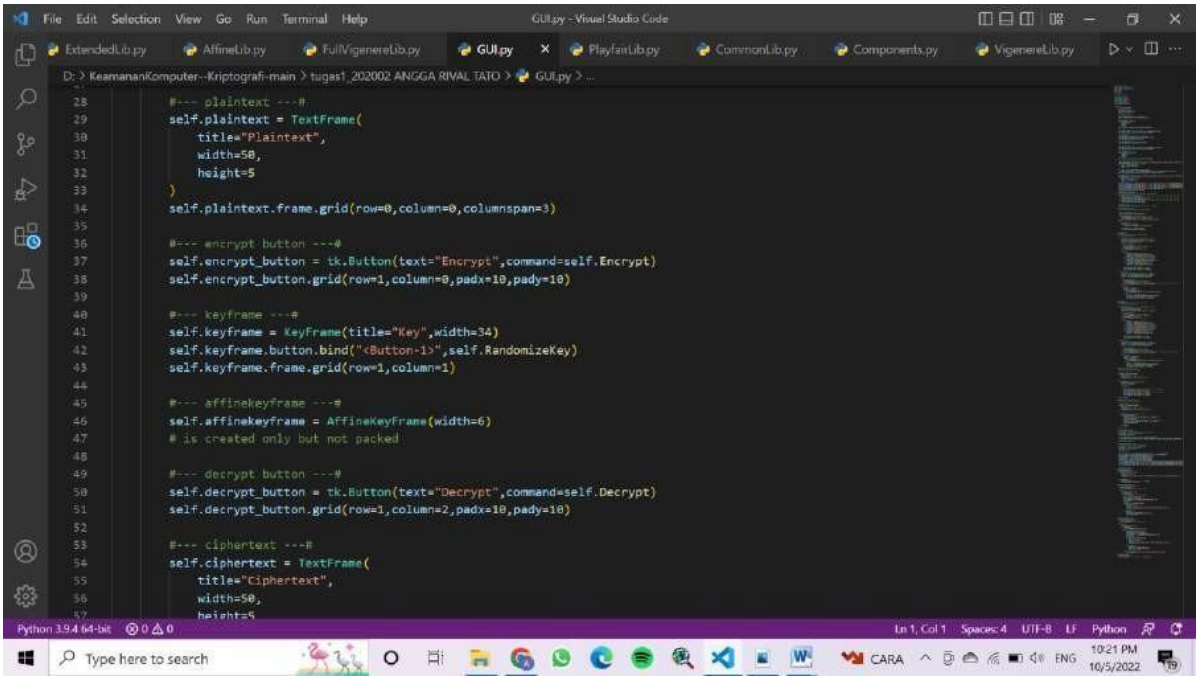
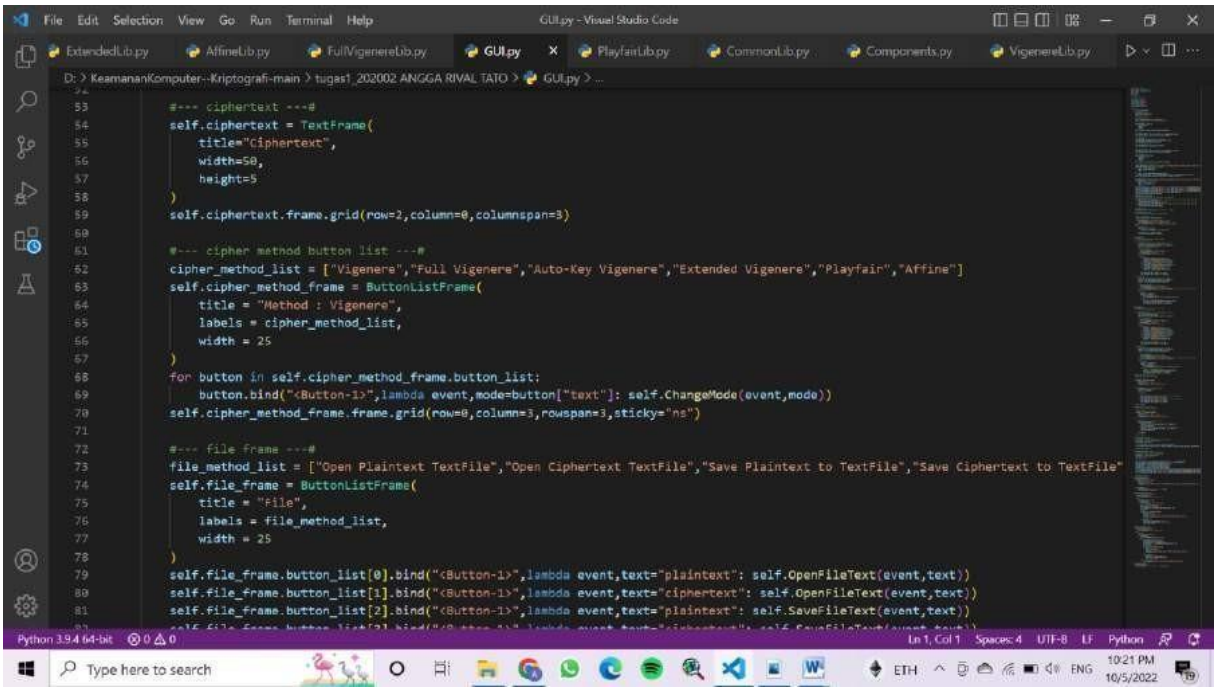
GUI.py



```python
import tkinter as tk
import tkinter.scrolledtext as st
import tkinter.filedialog as fd
import random
import math
import pickle

from Components import *

from CommonLib import *
from VigenereLib import *
from PlayfairLib import *
from AffineLib import *
from FullVigenereLib import *
from ExtendedLib import *

class GUI:
    def __init__(self,parent):
        #--- init ---#
        self.parent = parent
        parent.title("Kriptografi")
        self.mode = "Vigenere"

        #--- define grid ---#
        parent.columnconfigure([0,1,2,3],weight=1)
        parent.rowconfigure([0,1,2],weight=1,minsize=100)

        #--- plaintext ---#
        self.plaintext = TextFrame(
            title="Plaintext",
```



```python
        #--- plaintext ---#
        self.plaintext = TextFrame(
            title="Plaintext",
            width=50,
            height=5
        )
        self.plaintext.frame.grid(row=0,column=0,columnspan=3)

        #--- encrypt button ---#
        self.encrypt_button = tk.Button(text="Encrypt",command=self.Encrypt)
        self.encrypt_button.grid(row=1,column=0,padx=10,pady=10)

        #--- keyframe ---#
        self.keyframe = KeyFrame(title="Key",width=34)
        self.keyframe.button.bind("<Button-1>",self.RandomizeKey)
        self.keyframe.frame.grid(row=1,column=1)

        #--- affinekeyframe ---#
        self.affinekeyframe = AffineKeyFrame(width=6)
        # is created only but not packed

        #--- decrypt button ---#
        self.decrypt_button = tk.Button(text="Decrypt",command=self.Decrypt)
        self.decrypt_button.grid(row=1,column=2,padx=10,pady=10)

        #--- ciphertext ---#
        self.ciphertext = TextFrame(
            title="Ciphertext",
            width=50,
            height=5
```


File Edit Selection View Go Run Terminal Help
GUI.py - Visual Studio Code
ExtendedLib.py
AffineLib.py
FullVigenereLib.py
GUI.py
PlayfairLib.py
CommonLib.py
Components.py
VigenereLib.py
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#--- ciphertext ---#
self.ciphertext = TextFrame(
title="Ciphertext",
width=50,
height=5
)
self.ciphertext.frame.grid(row=2,column=0,columnspan=3)
#--- cipher method button list ---#
cipher_method_list = ["Vigenere","Full Vigenere","Auto-Key Vigenere","Extended Vigenere","Playfair","Affine"]
self.cipher_method_frame = ButtonListFrame(
title = "Method : Vigenere",
labels = cipher_method_list,
width = 25
)
for button in self.cipher_method_frame.button_list:
button.bind("<Button-1>",lambda event,mode=button["text"]: self.ChangeMode(event,mode))
self.cipher_method_frame.frame.grid(row=0,column=3,rowspan=3,sticky="ns")
#--- file frame ---#
file_method_list = ["Open Plaintext TextFile","Open Ciphertext TextFile","Save Plaintext to TextFile","Save Ciphertext to TextFile"
self.file_frame = ButtonListFrame(
title = "File",
labels = file_method_list,
width = 25
)
self.file_frame.button_list[0].bind("<Button-1>",lambda event,text="plaintext": self.OpenFileText(event,text))
self.file_frame.button_list[1].bind("<Button-1>",lambda event,text="ciphertext": self.OpenFileText(event,text))
self.file_frame.button_list[2].bind("<Button-1>",lambda event,text="plaintext": self.SaveFileText(event,text))
Python 3.9.4 64-bit
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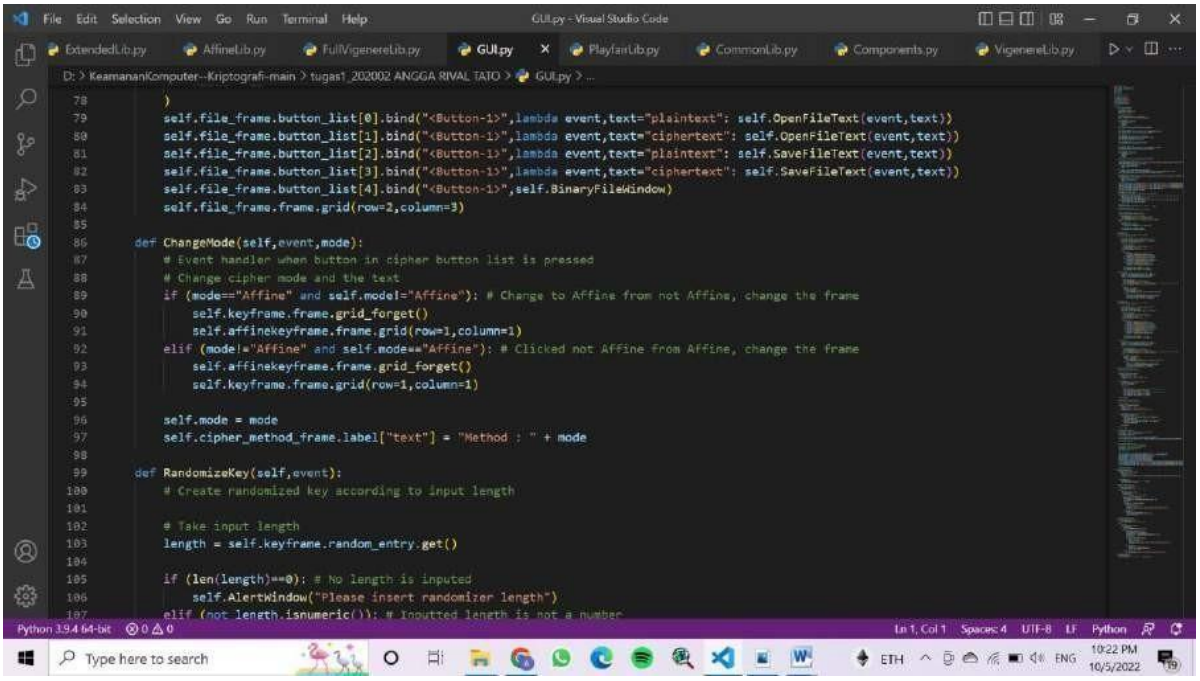
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GUI.py - Visual Studio Code
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AffineLib.py
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CommonLib.py
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)
self.file_frame.button_list[0].bind("<Button-1>",lambda event,text="plaintext": self.OpenFileText(event,text))
self.file_frame.button_list[1].bind("<Button-1>",lambda event,text="ciphertext": self.OpenFileText(event,text))
self.file_frame.button_list[2].bind("<Button-1>",lambda event,text="plaintext": self.SaveFileText(event,text))
self.file_frame.button_list[3].bind("<Button-1>",lambda event,text="ciphertext": self.SaveFileText(event,text))
self.file_frame.button_list[4].bind("<Button-1>",self.BinaryFileWindow)
self.file_frame.frame.grid(row=2,column=3)
def ChangeMode(self,event,mode):
# Event handler when button in cipher button list is pressed
# Change cipher mode and the text
if (mode=="Affine" and self.mode!="Affine"): # Change to Affine from not Affine, change the frame
self.keyframe.frame.grid_forget()
self.affinekeyframe.frame.grid(row=1,column=1)
elif (mode!="Affine" and self.mode=="Affine"): # Clicked not Affine from Affine, change the frame
self.affinekeyframe.frame.grid_forget()
self.keyframe.frame.grid(row=1,column=1)
self.mode = mode
self.cipher_method_frame.label["text"] = "Method : " + mode
def RandomizeKey(self,event):
# Create randomized key according to input length
# Take input length
length = self.keyframe.random_entry.get()
if (len(length)==0): # No length is inputed
self.AlertWindow("Please insert randomizer length")
elif (not length.isnumeric()): # Inputted length is not a number
Python 3.9.4 64-bit
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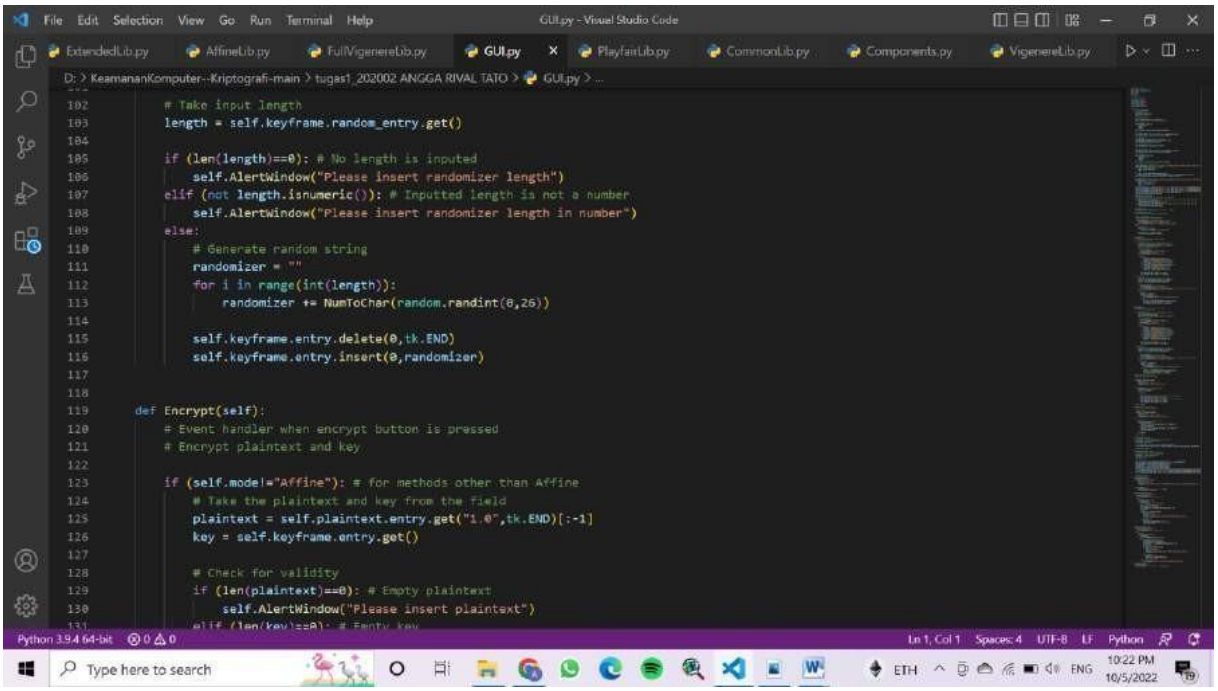
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# Take input length
length = self.keyframe.random_entry.get()
if (len(length)==0): # No length is inputed
self.AlertWindow("Please insert randomizer length")
elif (not length.isnumeric()): # Inputted length is not a number
self.AlertWindow("Please insert randomizer length in number")
else:
# Generate random string
randomizer = ""
for i in range(int(length)):
randomizer += NumToChar(random.randint(0,26))
self.keyframe.entry.delete(0,tk.END)
self.keyframe.entry.insert(0,randomizer)
def Encrypt(self):
# Event handler when encrypt button is pressed
# Encrypt plaintext and key
if (self.mode!="Affine"): # for methods other than Affine
# Take the plaintext and key from the field
plaintext = self.plaintext.entry.get("1.0",tk.END)[:-1]
key = self.keyframe.entry.get()
# Check for validity
if (len(plaintext)==0): # Empty plaintext
self.AlertWindow("Please insert plaintext")
Python 3.9.4 64-bit
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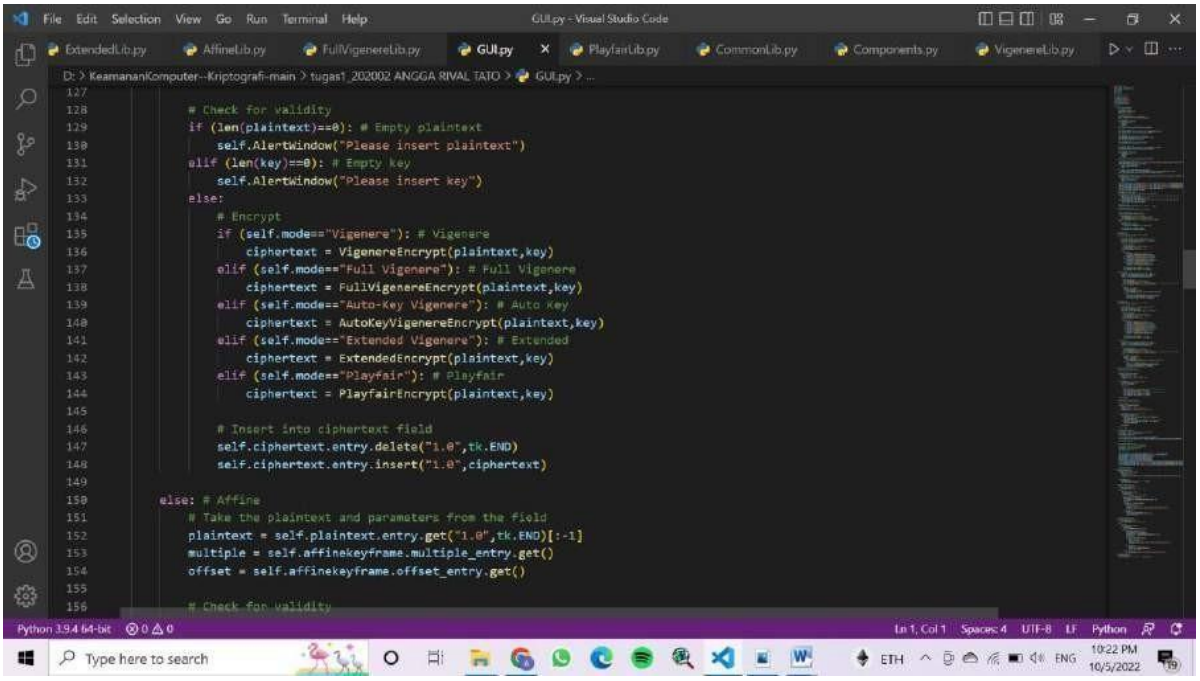
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# Check for validity
if (len(plaintext)==0): # Empty plaintext
self.AlertWindow("Please insert plaintext")
elif (len(key)==0): # Empty key
self.AlertWindow("Please insert key")
else:
# Encrypt
if (self.mode=="Vigenere"): # Vigenere
ciphertext = VigenereEncrypt(plaintext,key)
elif (self.mode=="Full Vigenere"): # Full Vigenere
ciphertext = FullVigenereEncrypt(plaintext,key)
elif (self.mode=="Auto-Key Vigenere"): # Auto Key
ciphertext = AutoKeyVigenereEncrypt(plaintext,key)
elif (self.mode=="Extended Vigenere"): # Extended
ciphertext = ExtendedEncrypt(plaintext,key)
elif (self.mode=="Playfair"): # Playfair
ciphertext = PlayfairEncrypt(plaintext,key)
# Insert into ciphertext field
self.ciphertext.entry.delete("1.0",tk.END)
self.ciphertext.entry.insert("1.0",ciphertext)
else: # Affine
# Take the plaintext and parameters from the field
plaintext = self.plaintext.entry.get("1.0",tk.END)[:-1]
multiple = self.affinekeyframe.multiple_entry.get()
offset = self.affinekeyframe.offset_entry.get()
# Check for validity
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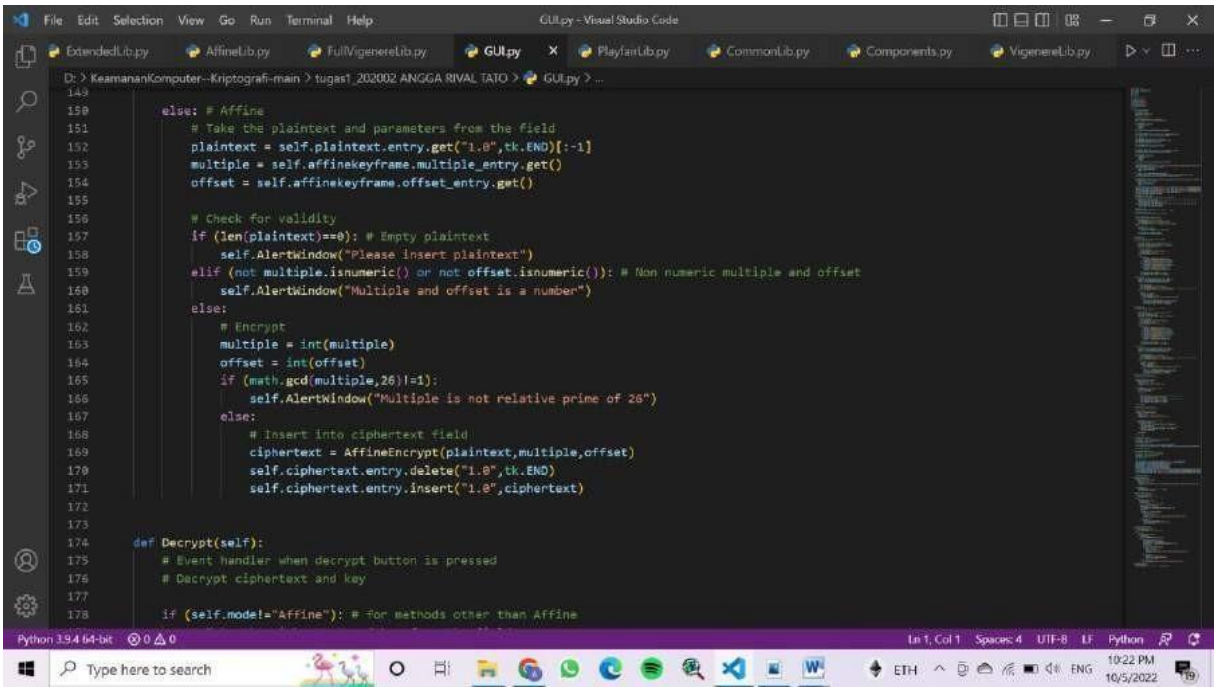
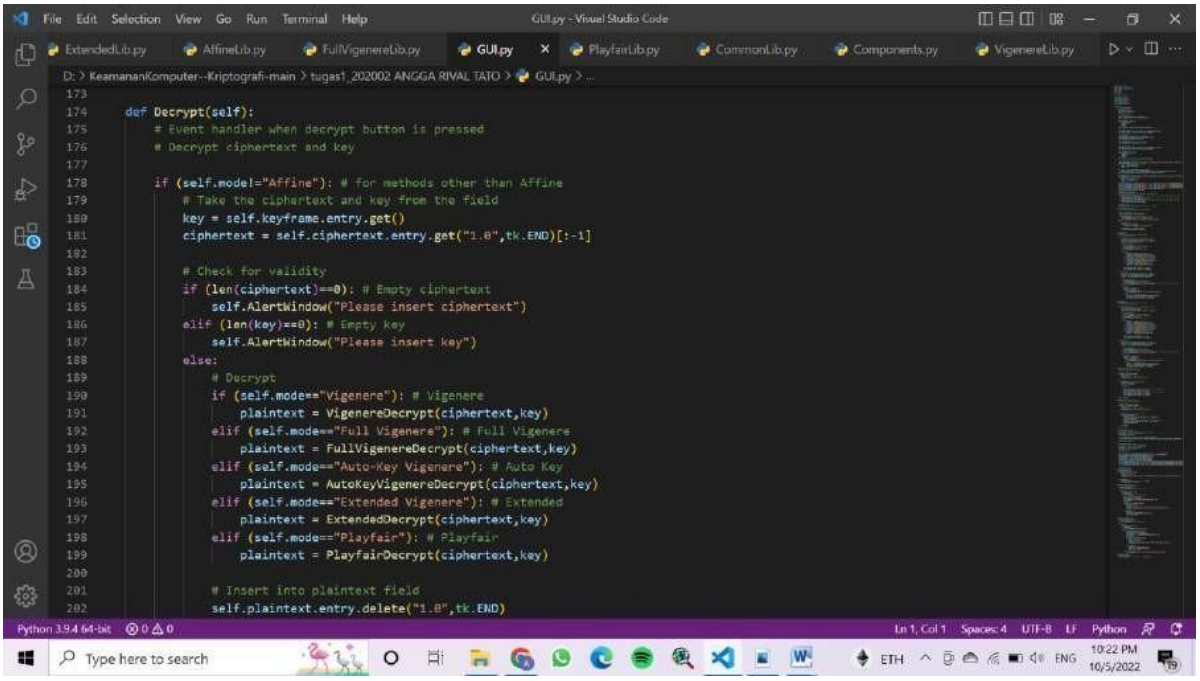


```
        else: # Affine
            # Take the plaintext and parameters from the field
            plaintext = self.plaintext.entry.get("1.0",tk.END)[:-1]
            multiple = self.affinekeyframe.multiple_entry.get()
            offset = self.affinekeyframe.offset_entry.get()

            # Check for validity
            if (len(plaintext)==0): # Empty plaintext
                self.AlertWindow("Please insert plaintext")
            elif (not multiple.isnumeric() or not offset.isnumeric()): # Non numeric multiple and offset
                self.AlertWindow("Multiple and offset is a number")
            else:
                # Encrypt
                multiple = int(multiple)
                offset = int(offset)
                if (math.gcd(multiple,26)!=1):
                    self.AlertWindow("Multiple is not relative prime of 26")
                else:
                    # Insert into ciphertext field
                    ciphertext = AffineEncrypt(plaintext,multiple,offset)
                    self.ciphertext.entry.delete("1.0",tk.END)
                    self.ciphertext.entry.insert("1.0",ciphertext)


    def Decrypt(self):
        # Event handler when decrypt button is pressed
        # Decrypt ciphertext and key

        if (self.mode!="Affine"): # for methods other than Affine
```

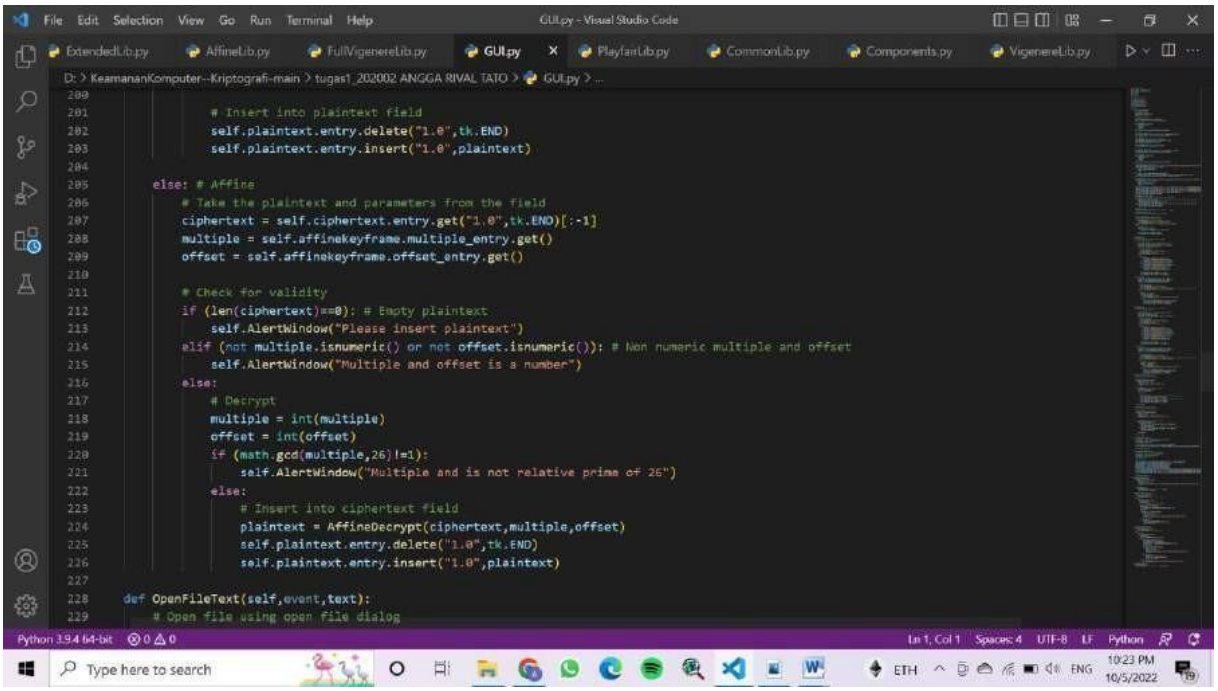


```
    def Decrypt(self):
        # Event handler when decrypt button is pressed
        # Decrypt ciphertext and key

        if (self.mode!="Affine"): # for methods other than Affine
            # Take the ciphertext and key from the field
            key = self.keyframe.entry.get()
            ciphertext = self.ciphertext.entry.get("1.0",tk.END)[:-1]

            # Check for validity
            if (len(ciphertext)==0): # Empty ciphertext
                self.AlertWindow("Please insert ciphertext")
            elif (len(key)==0): # Empty key
                self.AlertWindow("Please insert key")
            else:
                # Decrypt
                if (self.mode=="Vigenere"): # Vigenere
                    plaintext = VigenereDecrypt(ciphertext,key)
                elif (self.mode=="Full Vigenere"): # Full Vigenere
                    plaintext = FullVigenereDecrypt(ciphertext,key)
                elif (self.mode=="Auto-Key Vigenere"): # Auto Key
                    plaintext = AutoKeyVigenereDecrypt(ciphertext,key)
                elif (self.mode=="Extended Vigenere"): # Extended
                    plaintext = ExtendedDecrypt(ciphertext,key)
                elif (self.mode=="Playfair"): # Playfair
                    plaintext = PlayfairDecrypt(ciphertext,key)

                # Insert into plaintext field
                self.plaintext.entry.delete("1.0",tk.END)
```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# Insert into plaintext field
self.plaintext.entry.delete("1.0",tk.END)
self.plaintext.entry.insert("1.0",plaintext)
else: # Affine
# Take the plaintext and parameters from the field
ciphertext = self.ciphertext.entry.get("1.0",tk.END)[:-1]
multiple = self.affinekeyframe.multiple_entry.get()
offset = self.affinekeyframe.offset_entry.get()
# Check for validity
if (len(ciphertext)==0): # Empty plaintext
self.AlertWindow("Please insert plaintext")
elif (not multiple.isnumeric() or not offset.isnumeric()): # Non numeric multiple and offset
self.AlertWindow("Multiple and offset is a number")
else:
# Decrypt
multiple = int(multiple)
offset = int(offset)
if (math.gcd(multiple,26)!=1):
self.AlertWindow("Multiple and is not relative prima of 26")
else:
# Insert into ciphertext field
plaintext = AffineDecrypt(ciphertext,multiple,offset)
self.plaintext.entry.delete("1.0",tk.END)
self.plaintext.entry.insert("1.0",plaintext)
def OpenFileText(self,event,text):
# Open file using open file dialog
Python 3.9.4 64-bit
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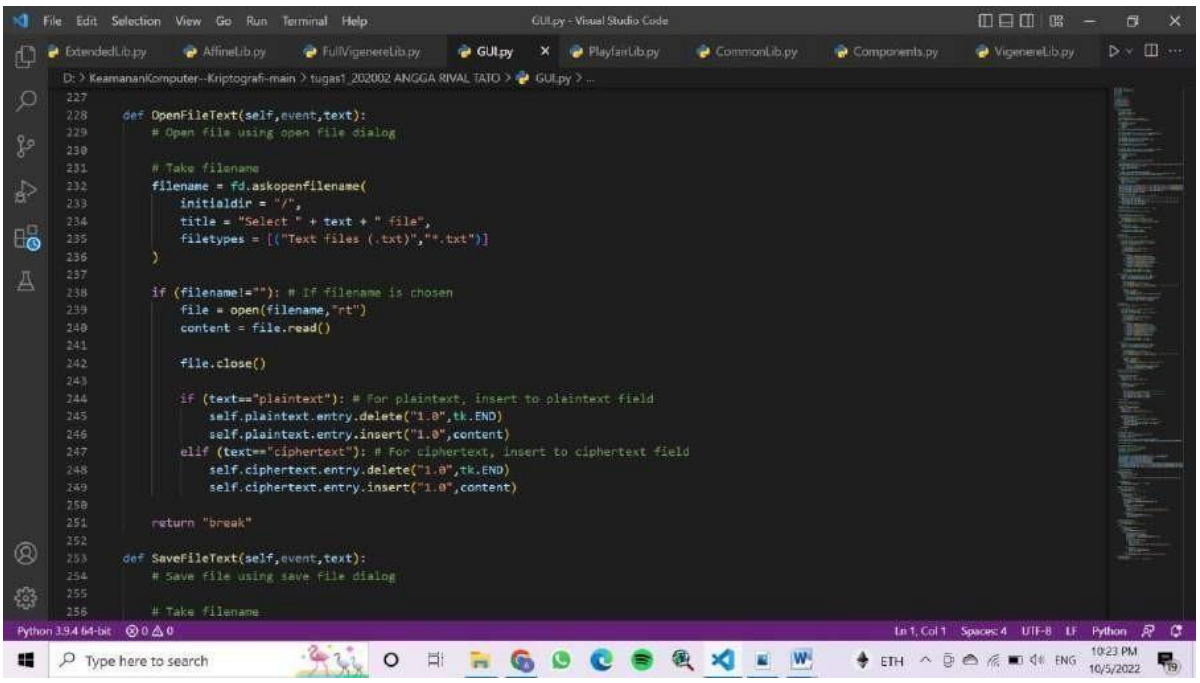
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def OpenFileText(self,event,text):
# Open file using open file dialog
# Take filename
filename = fd.askopenfilename(
initialdir = "/",
title = "Select " + text + " file",
filetypes = [("Text files (.txt)","*.txt")]
)
if (filename!=""): # If filename is chosen
file = open(filename,"rt")
content = file.read()
file.close()
if (text=="plaintext"): # For plaintext, insert to plaintext field
self.plaintext.entry.delete("1.0",tk.END)
self.plaintext.entry.insert("1.0",content)
elif (text=="ciphertext"): # For ciphertext, insert to ciphertext field
self.ciphertext.entry.delete("1.0",tk.END)
self.ciphertext.entry.insert("1.0",content)
return "break"
def SaveFileText(self,event,text):
# Save file using save file dialog
# Take filename
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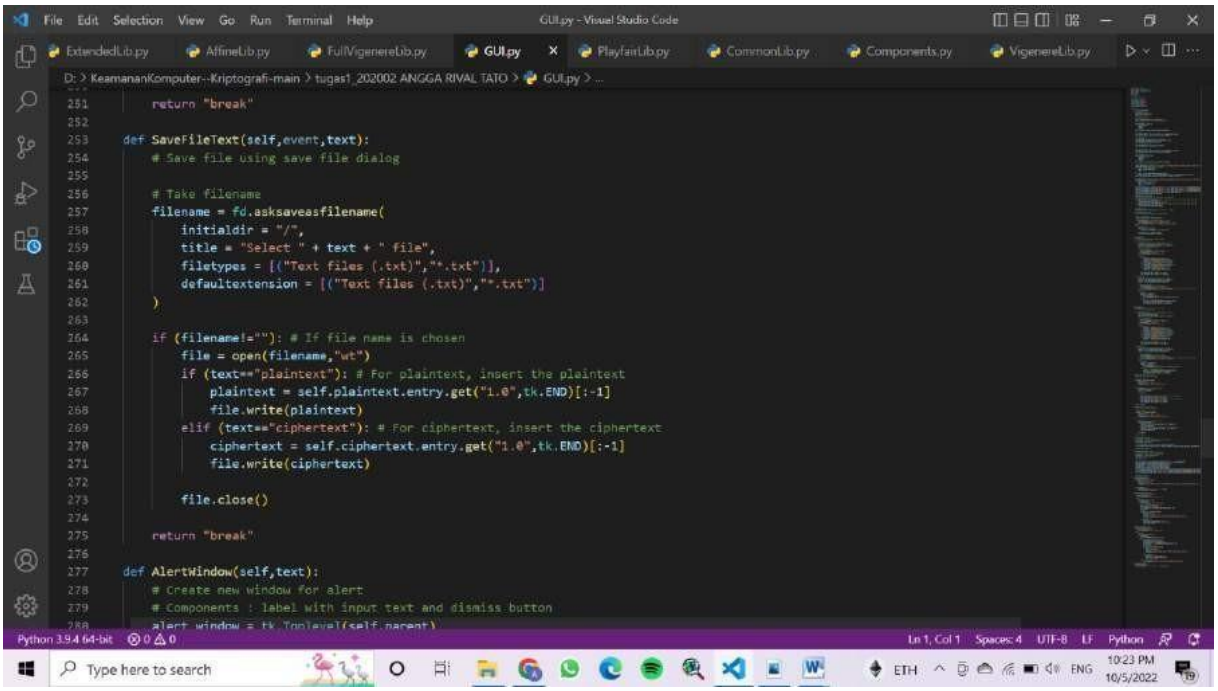
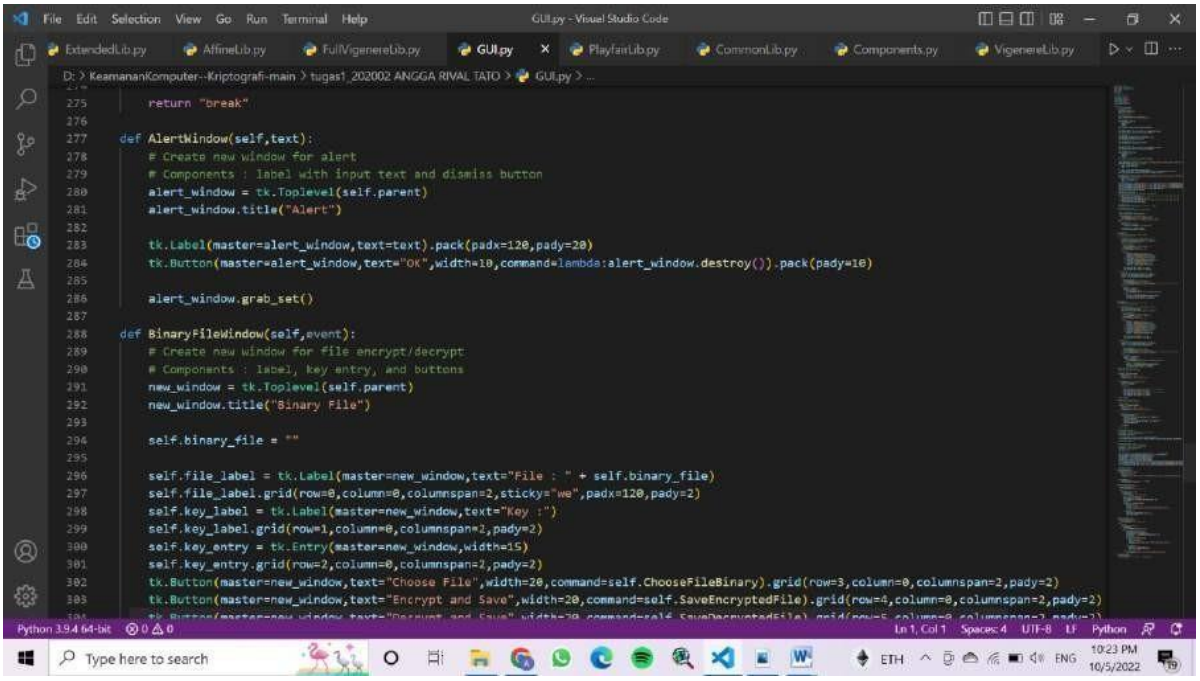
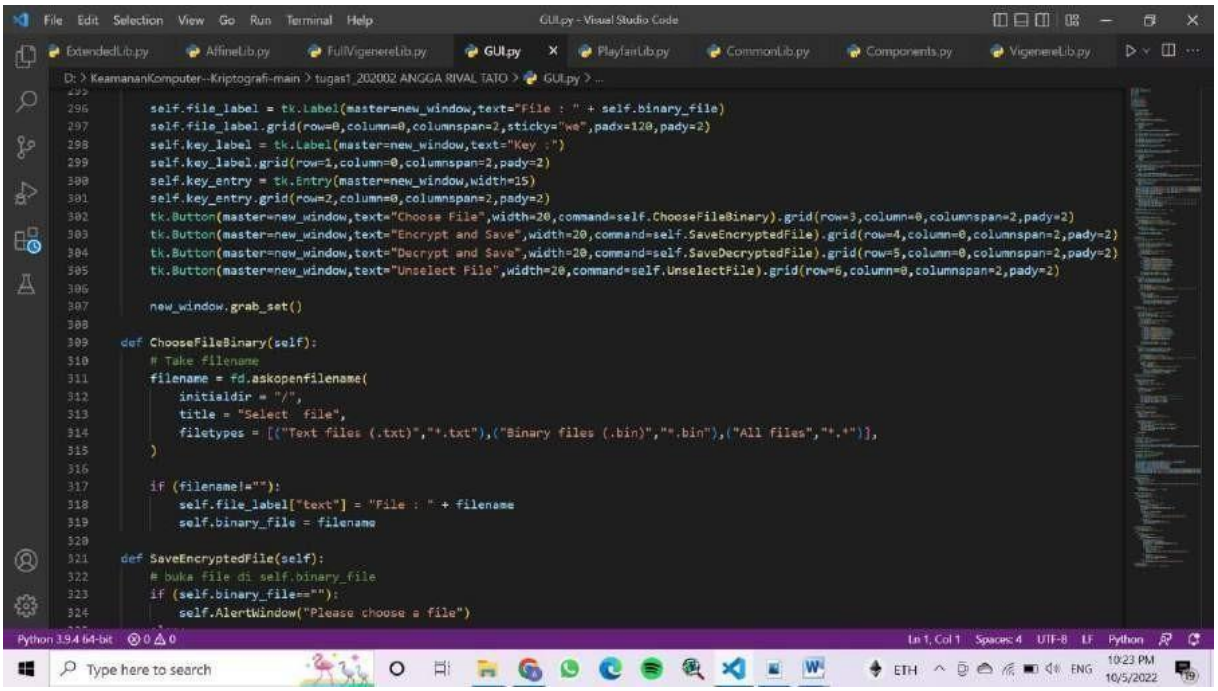


```
        return "break"

    def SaveFileText(self,event,text):
        # Save file using save file dialog

        # Take filename
        filename = fd.asksaveasfilename(
            initialdir = "/",
            title = "Select " + text + " file",
            filetypes = [("Text files (.txt)","*.txt")],
            defaultextension = [("Text files (.txt)","*.txt")]
        )

        if (filename!=""): # If file name is chosen
            file = open(filename,"wt")
            if (text=="plaintext"): # For plaintext, insert the plaintext
                plaintext = self.plaintext.entry.get("1.0",tk.END)[:-1]
                file.write(plaintext)
            elif (text=="ciphertext"): # For ciphertext, insert the ciphertext
                ciphertext = self.ciphertext.entry.get("1.0",tk.END)[:-1]
                file.write(ciphertext)

            file.close()

        return "break"

    def AlertWindow(self,text):
        # Create new window for alert
        # Components : label with input text and dismiss button
        alert_window = tk.Toplevel(self.parent)
```



```
        return "break"

    def AlertWindow(self,text):
        # Create new window for alert
        # Components : label with input text and dismiss button
        alert_window = tk.Toplevel(self.parent)
        alert_window.title("Alert")

        tk.Label(master=alert_window,text=text).pack(padx=120,pady=20)
        tk.Button(master=alert_window,text="OK",width=10,command=lambda:alert_window.destroy()).pack(pady=10)

        alert_window.grab_set()

    def BinaryFileWindow(self,event):
        # Create new window for file encrypt/decrypt
        # Components : label, key entry, and buttons
        new_window = tk.Toplevel(self.parent)
        new_window.title("Binary File")

        self.binary_file = ""

        self.file_label = tk.Label(master=new_window,text="File : " + self.binary_file)
        self.file_label.grid(row=0,column=0,columnspan=2,sticky="we",padx=120,pady=2)
        self.key_label = tk.Label(master=new_window,text="Key :")
        self.key_label.grid(row=1,column=0,columnspan=2,pady=2)
        self.key_entry = tk.Entry(master=new_window,width=15)
        self.key_entry.grid(row=2,column=0,columnspan=2,pady=2)
        tk.Button(master=new_window,text="Choose File",width=20,command=self.ChooseFileBinary).grid(row=3,column=0,columnspan=2,pady=2)
        tk.Button(master=new_window,text="Encrypt and Save",width=20,command=self.SaveEncryptedFile).grid(row=4,column=0,columnspan=2,pady=2)
```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self.file_label = tk.Label(master=new_window,text="File : " + self.binary_file)
self.file_label.grid(row=0,column=0,columnspan=2,sticky="we",padx=120,pady=2)
self.key_label = tk.Label(master=new_window,text="Key :")
self.key_label.grid(row=1,column=0,columnspan=2,pady=2)
self.key_entry = tk.Entry(master=new_window,width=15)
self.key_entry.grid(row=2,column=0,columnspan=2,pady=2)
tk.Button(master=new_window,text="Choose File",width=20,command=self.ChooseFileBinary).grid(row=3,column=0,columnspan=2,pady=2)
tk.Button(master=new_window,text="Encrypt and Save",width=20,command=self.SaveEncryptedFile).grid(row=4,column=0,columnspan=2,pady=2)
tk.Button(master=new_window,text="Decrypt and Save",width=20,command=self.SaveDecryptedFile).grid(row=5,column=0,columnspan=2,pady=2)
tk.Button(master=new_window,text="Unselect File",width=20,command=self.UnselectFile).grid(row=6,column=0,columnspan=2,pady=2)
new_window.grab_set()
def ChooseFileBinary(self):
# Take filename
filename = fd.askopenfilename(
initialdir = "/",
title = "Select file",
filetypes = [("Text files (.txt)","*.txt"),("Binary files (.bin)","*.bin"),("All files","*.*")],
)
if (filename!=""):
self.file_label["text"] = "File : " + filename
self.binary_file = filename
def SaveEncryptedFile(self):
# buka file di self.binary_file
if (self.binary_file==""):
self.AlertWindow("Please choose a file")
Python 3.9.4 64-bit
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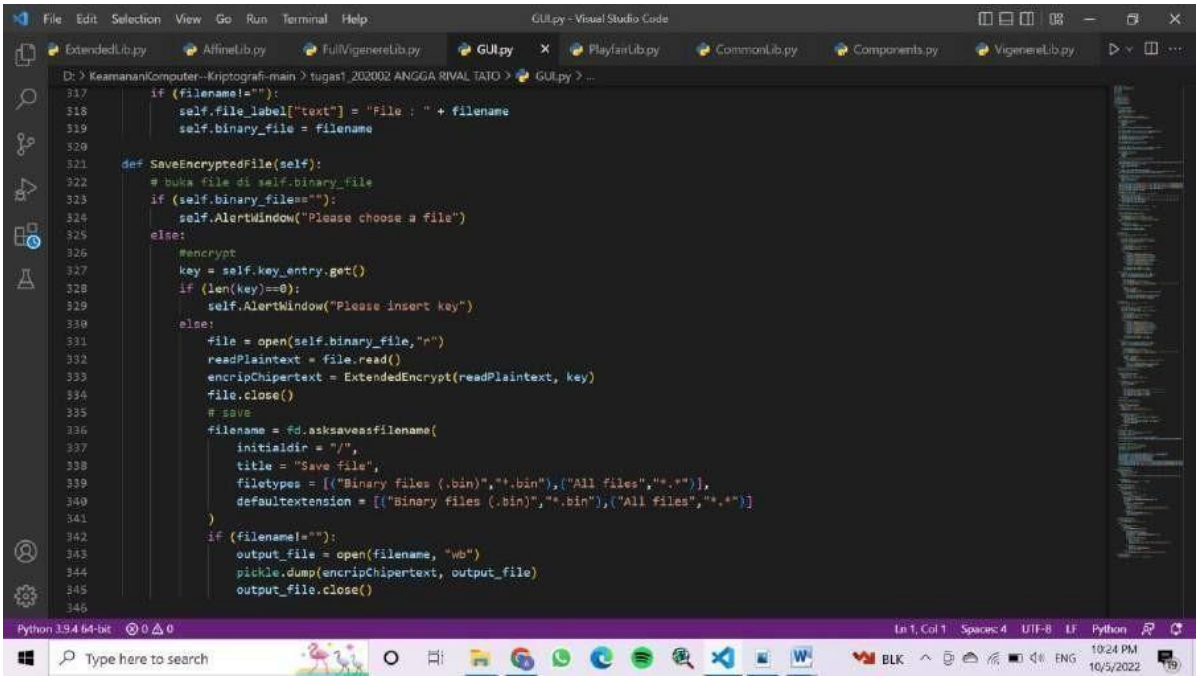
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if (filename!=""):
self.file_label["text"] = "File : " + filename
self.binary_file = filename
def SaveEncryptedFile(self):
# buka file di self.binary_file
if (self.binary_file==""):
self.AlertWindow("Please choose a file")
else:
#encrypt
key = self.key_entry.get()
if (len(key)==0):
self.AlertWindow("Please insert key")
else:
file = open(self.binary_file,"r")
readPlaintext = file.read()
encripChipertext = ExtendedEncrypt(readPlaintext, key)
file.close()
# save
filename = fd.asksaveasfilename(
initialdir = "/",
title = "Save file",
filetypes = [("Binary files (.bin)","*.bin"),("All files","*.*")],
defaultextension = [("Binary files (.bin)","*.bin"),("All files","*.*")]
)
if (filename!=""):
output_file = open(filename, "wb")
pickle.dump(encripChipertext, output_file)
output_file.close()
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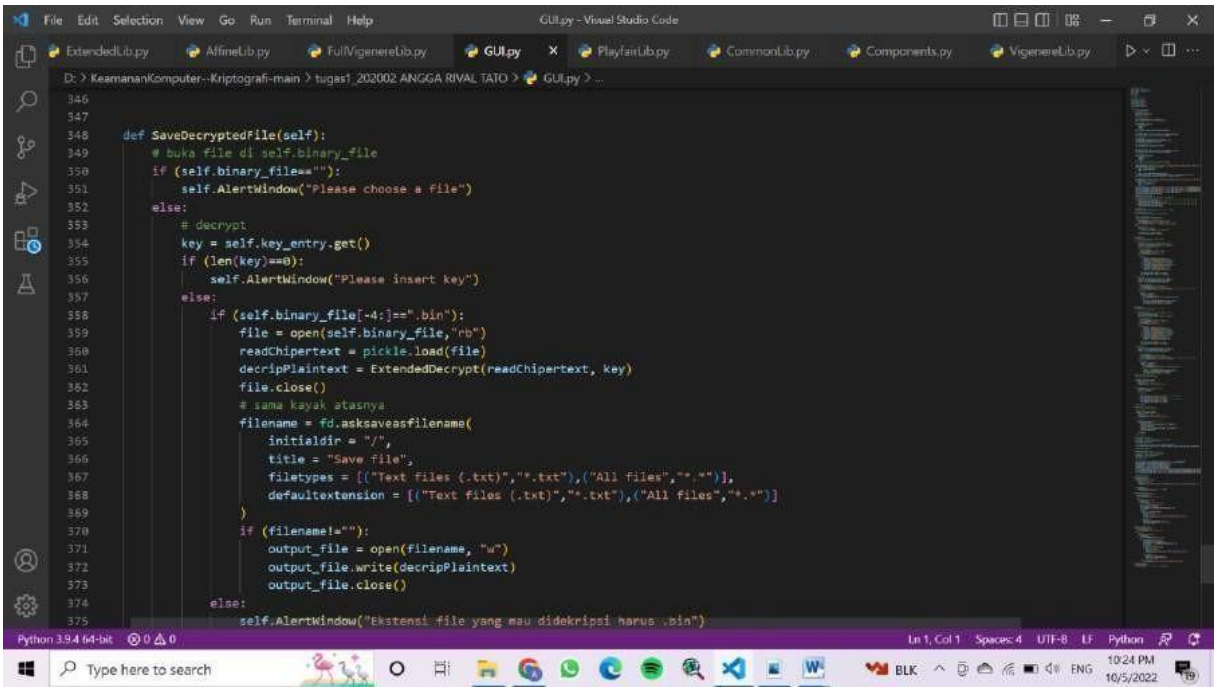
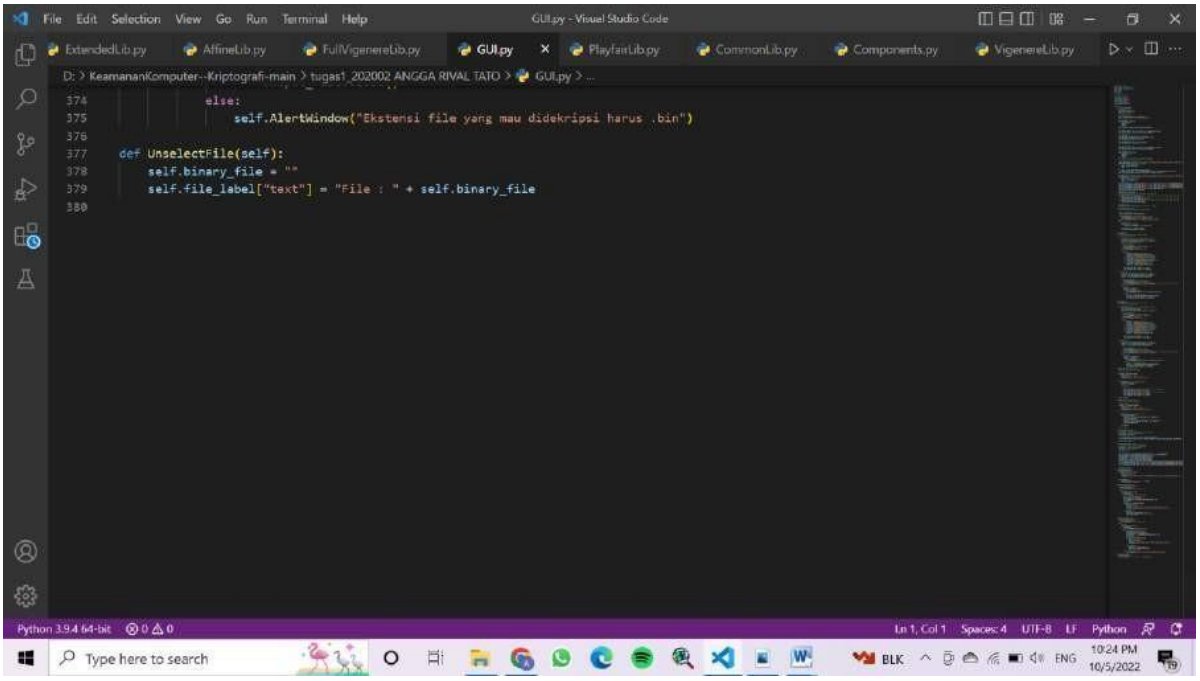
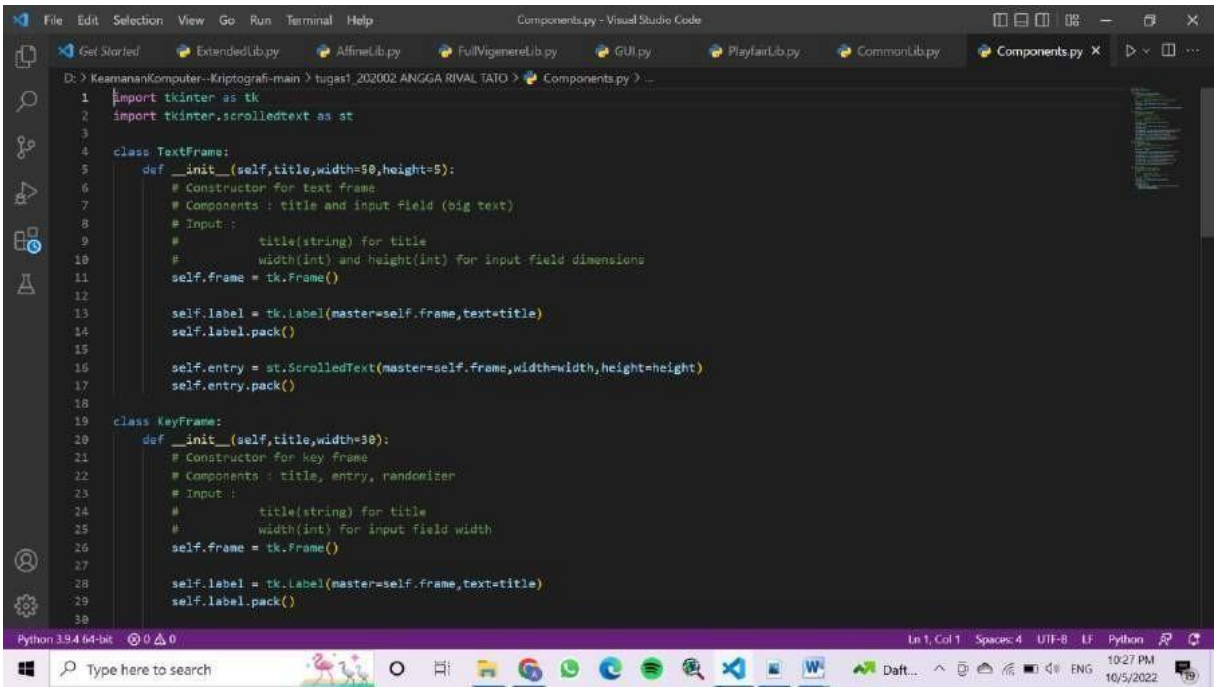


```
def SaveDecryptedFile(self):
    # buka file di self.binary_file
    if (self.binary_file==""):
        self.AlertWindow("Please choose a file")
    else:
        # decrypt
        key = self.key_entry.get()
        if (len(key)==0):
            self.AlertWindow("Please insert key")
        else:
            if (self.binary_file[-4:]==".bin"):
                file = open(self.binary_file,"rb")
                readChipertext = pickle.load(file)
                decripPlaintext = ExtendedDecrypt(readChipertext, key)
                file.close()
                # sama kayak atasnya
                filename = fd.asksaveasfilename(
                    initialdir = "/",
                    title = "Save file",
                    filetypes = [("Text files (.txt)","*.txt"),("All files","*.*")],
                    defaultextension = [("Text files (.txt)","*.txt"),("All files","*.*")]
                )
                if (filename!=""):
                    output_file = open(filename, "w")
                    output_file.write(decripPlaintext)
                    output_file.close()
            else:
                self.AlertWindow("Ekstensi file yang mau didekripsi harus .bin")
```

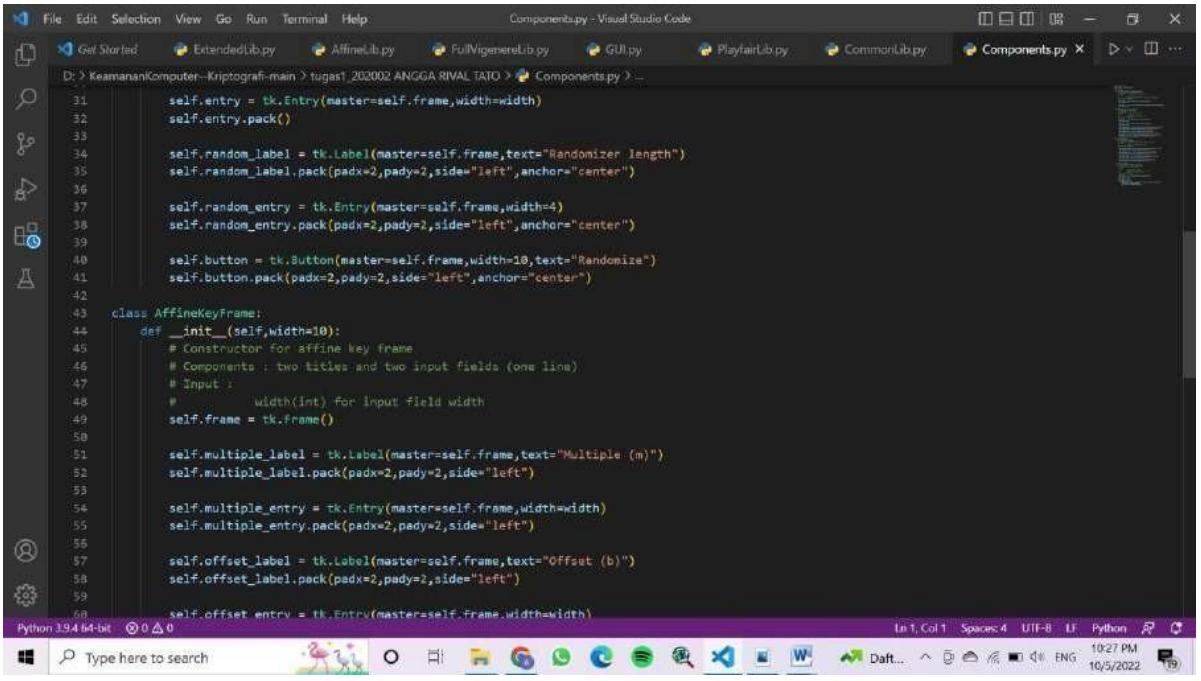


```
            else:
                self.AlertWindow("Ekstensi file yang mau didekripsi harus .bin")

    def UnselectFile(self):
        self.binary_file = ""
        self.file_label["text"] = "File : " + self.binary_file
```

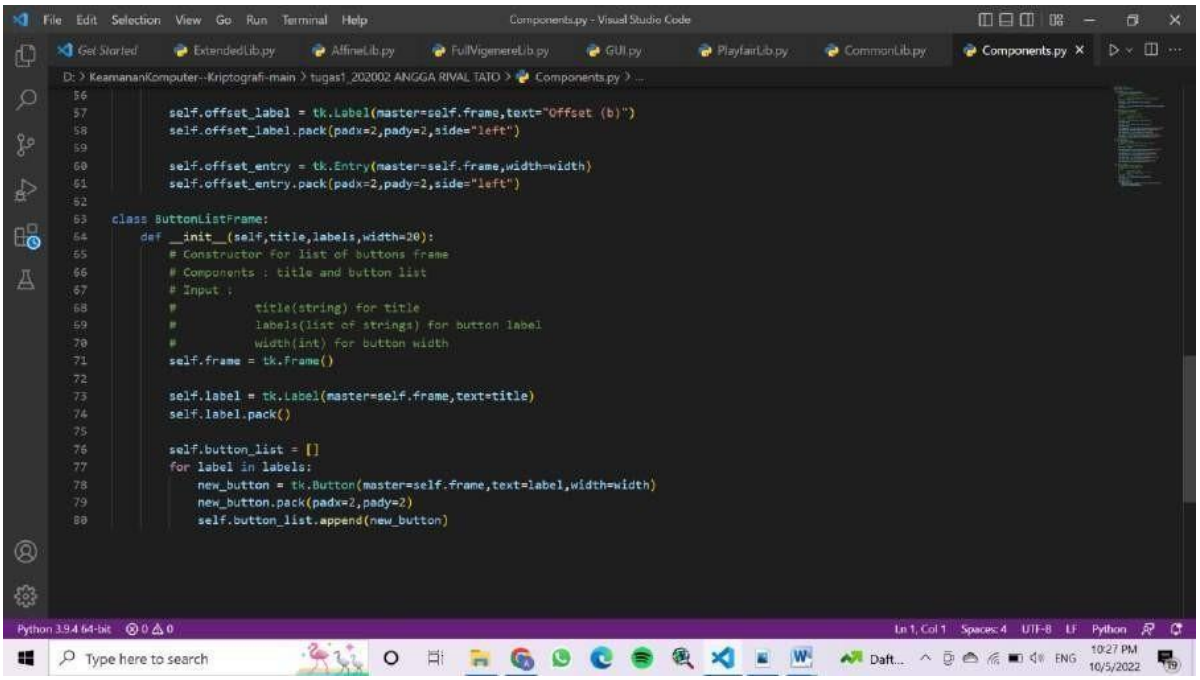
Componets.py



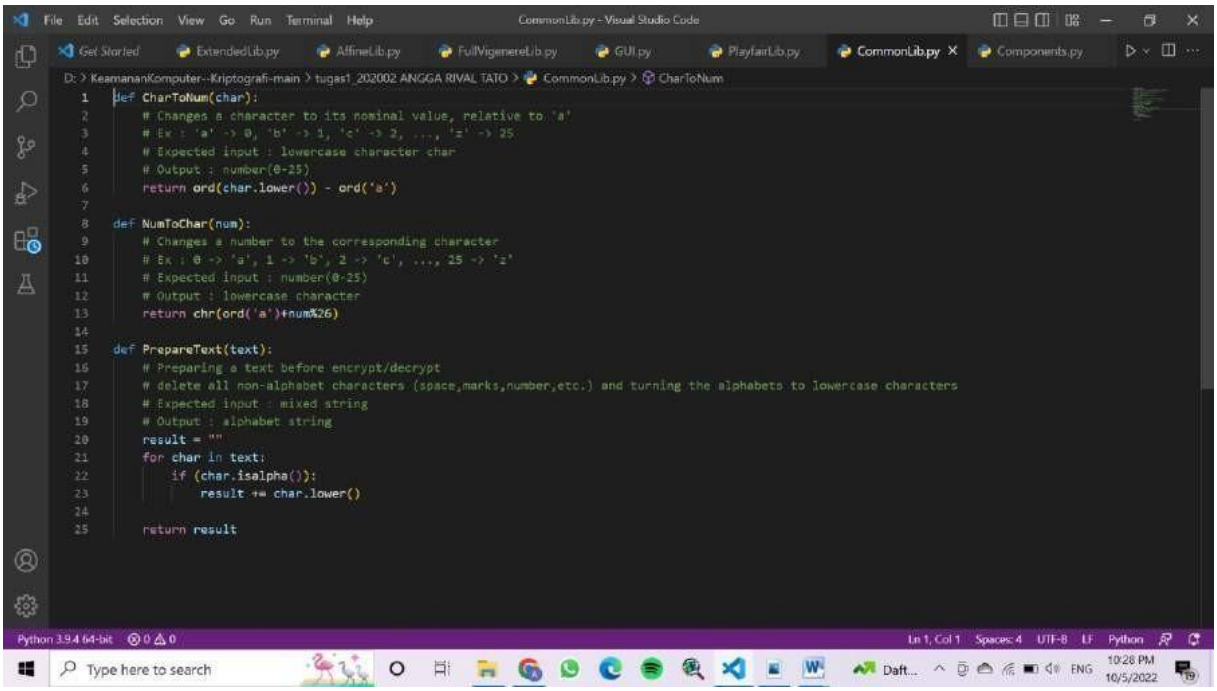
```python
import tkinter as tk
import tkinter.scrolledtext as st

class TextFrame:
    def __init__(self,title,width=50,height=5):
        # Constructor for text frame
        # Components : title and input field (big text)
        # Input :
        #          title(string) for title
        #          width(int) and height(int) for input field dimensions
        self.frame = tk.Frame()

        self.label = tk.Label(master=self.frame,text=title)
        self.label.pack()

        self.entry = st.ScrolledText(master=self.frame,width=width,height=height)
        self.entry.pack()

class KeyFrame:
    def __init__(self,title,width=30):
        # Constructor for key frame
        # Components : title, entry, randomizer
        # Input :
        #          title(string) for title
        #          width(int) for input field width
        self.frame = tk.Frame()

        self.label = tk.Label(master=self.frame,text=title)
        self.label.pack()
```



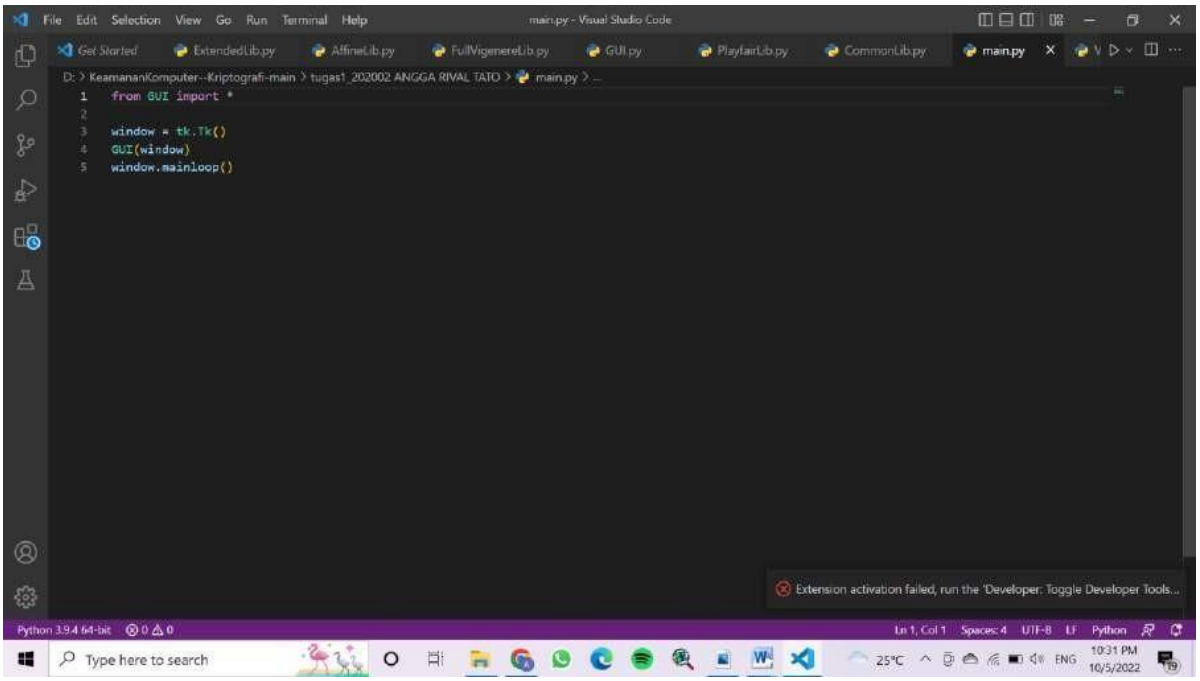
```python
        self.entry = tk.Entry(master=self.frame,width=width)
        self.entry.pack()

        self.random_label = tk.Label(master=self.frame,text="Randomizer length")
        self.random_label.pack(padx=2,pady=2,side="left",anchor="center")

        self.random_entry = tk.Entry(master=self.frame,width=4)
        self.random_entry.pack(padx=2,pady=2,side="left",anchor="center")

        self.button = tk.Button(master=self.frame,width=10,text="Randomize")
        self.button.pack(padx=2,pady=2,side="left",anchor="center")

class AffineKeyFrame:
    def __init__(self,width=10):
        # Constructor for affine key frame
        # Components : two titles and two input fields (one line)
        # Input :
        #          width(int) for input field width
        self.frame = tk.Frame()

        self.multiple_label = tk.Label(master=self.frame,text="Multiple (m)")
        self.multiple_label.pack(padx=2,pady=2,side="left")

        self.multiple_entry = tk.Entry(master=self.frame,width=width)
        self.multiple_entry.pack(padx=2,pady=2,side="left")

        self.offset_label = tk.Label(master=self.frame,text="Offset (b)")
        self.offset_label.pack(padx=2,pady=2,side="left")

        self.offset_entry = tk.Entry(master=self.frame,width=width)
```


File Edit Selection View Go Run Terminal Help
Components.py - Visual Studio Code
Get Started
ExtendedLib.py
AffineLib.py
FullVigenereLib.py
GUI.py
PlayfairLib.py
CommonLib.py
Components.py
D: > KeamananKomputer--Kriptografi-main > tugas1_202002 ANGGA RIVAL TATO > Components.py > ...
self.offset_label = tk.Label(master=self.frame,text="Offset (b)")
self.offset_label.pack(padx=2,pady=2,side="left")
self.offset_entry = tk.Entry(master=self.frame,width=width)
self.offset_entry.pack(padx=2,pady=2,side="left")
class ButtonListFrame:
def __init__(self,title,labels,width=20):
# Constructor for list of buttons frame
# Components : title and button list
# Input :
# title(string) for title
# labels(list of strings) for button label
# width(int) for button width
self.frame = tk.Frame()
self.label = tk.Label(master=self.frame,text=title)
self.label.pack()
self.button_list = []
for label in labels:
new_button = tk.Button(master=self.frame,text=label,width=width)
new_button.pack(padx=2,pady=2)
self.button_list.append(new_button)
Python 3.9.4 64-bit
Ln 1, Col 1
Spaces: 4
UTF-8
LF
Python
Type here to search
Daft...
ENG
10:27 PM
10/5/2022

CommonLib.py



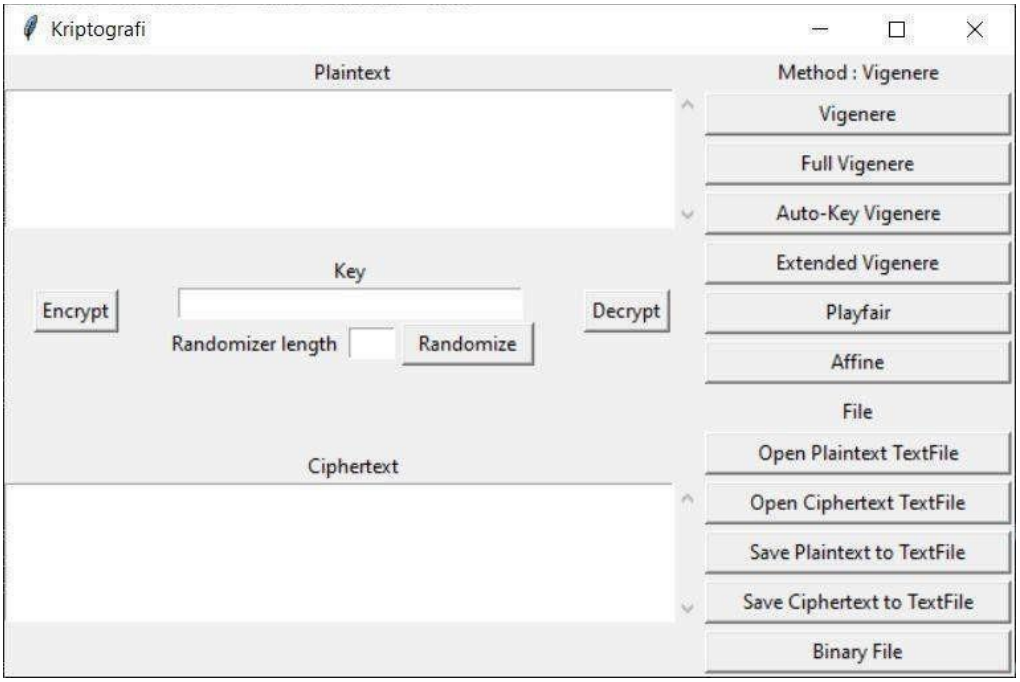
main.py



2. Tampilan antarmuka program (print screen)

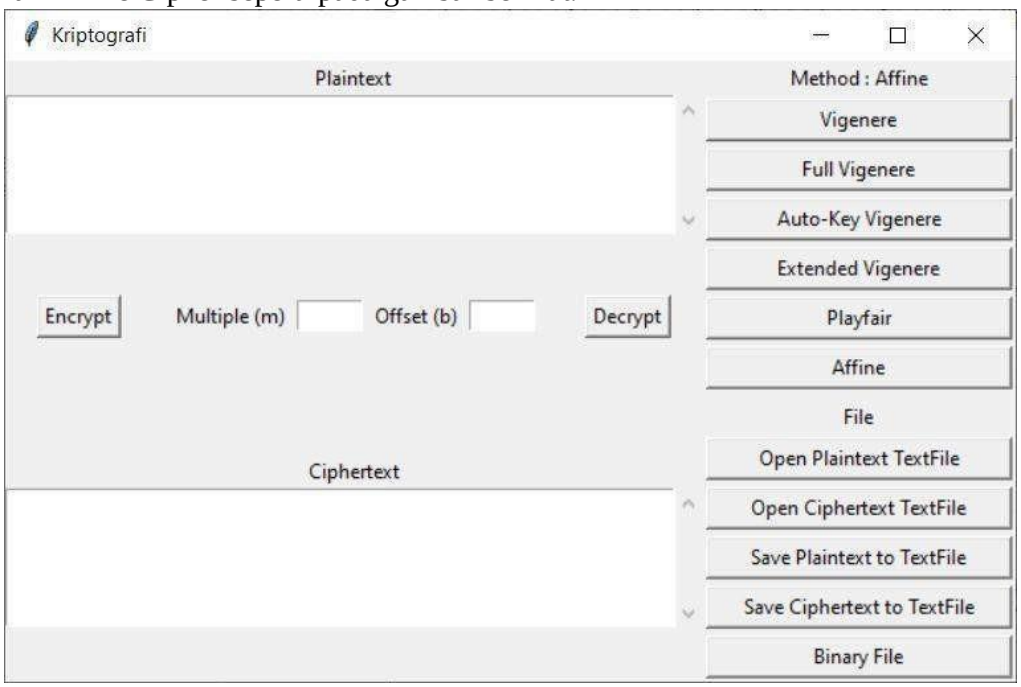
Antarmuka program dibuat dengan menggunakan tkinter pada dengan komponen pada Components.py dan digabungkan pada GUI.py.

Berikut adalah tampilan dari antarmuka program yang dibuat.



Gambar 1. Tampilan Antarmuka Program

Untuk metode Affine Cipher yang tidak menggunakan key, tampilan dari KeyFrame akan berubah ketika dipilih metode Affine Cipher. Pada tampilan ini, diminta input parameter m dan b untuk melakukan Affine Cipher seperti pada gambar berikut.



Gambar 2. Tampilan Antarmuka Program pada Affine Cipher

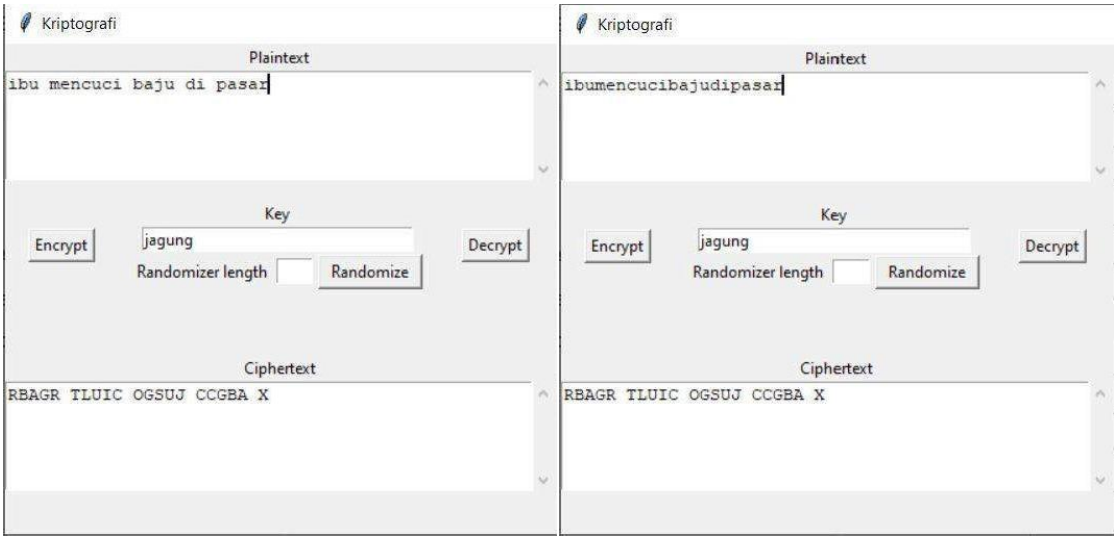
Untuk handling file binary, ketika button “Binary File” di pojok kanan bawah ditekan akan muncul window sebagai berikut.

Gambar 3. Tampilan Antarmuka Program untuk Binary File

3. Contoh plainteks dan cipherteks (text, gambar, file database, audio, video)

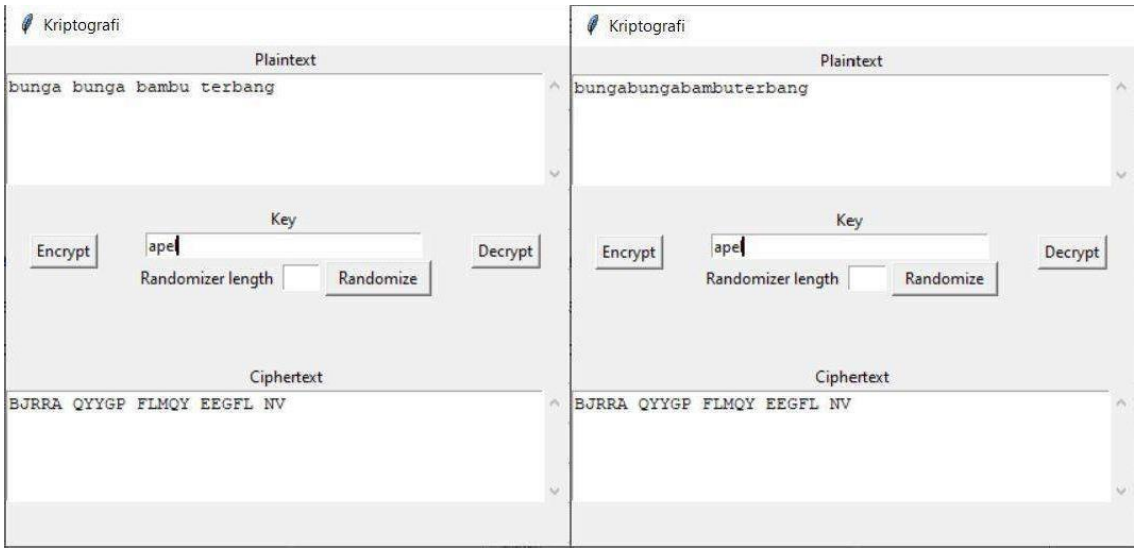
Pengujian Vigenere Cipher

Pada pengujian pertama, digunakan plaintext “ibu mencuci baju di pasar” dengan key “jagung” yang dienkripsi dengan Vigenere Cipher kemudian didekripsi lagi.



Gambar 4. Pengujian Vigenere Cipher 1

Selanjutnya, digunakan input plaintext “bunga bunga bambu terbang” dengan key “apel” yang memberikan hasil sebagai berikut.

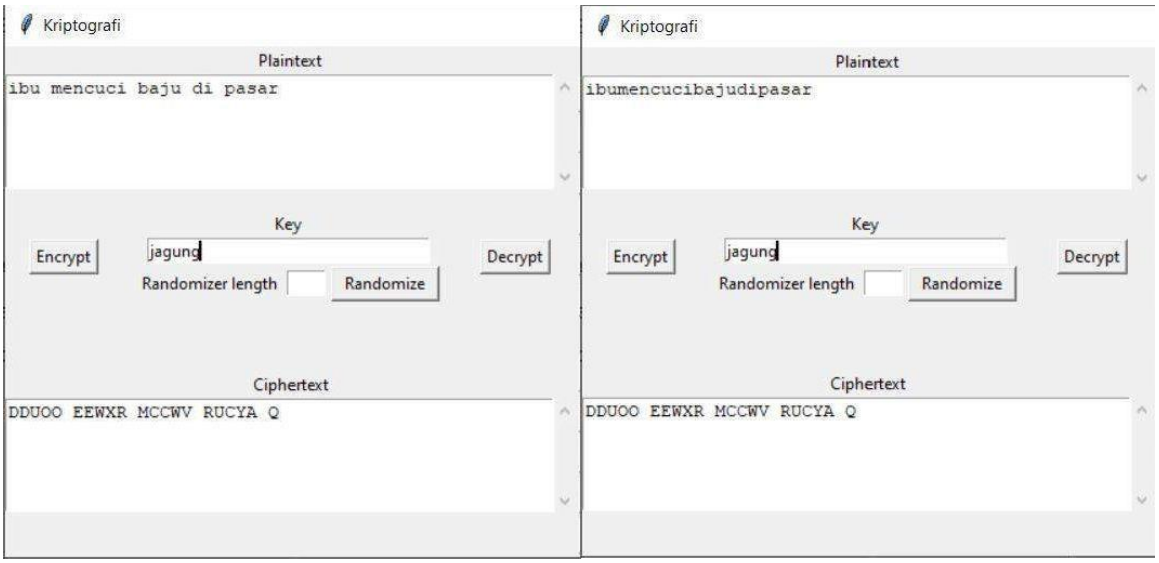


Gambar 5. Pengujian Vigenere Cipher 2

Dari hasil yang diperoleh, terlihat bahwa proses enkripsi-dekripsi yang terjadi berjalan dengan baik, hanya saja terjadi kehilangan informasi pada teks selain alfabet (seperti spasi). Hal ini sudah sesuai dengan spesifikasi yang diharapkan.

Pengujian Full Vigenere Cipher

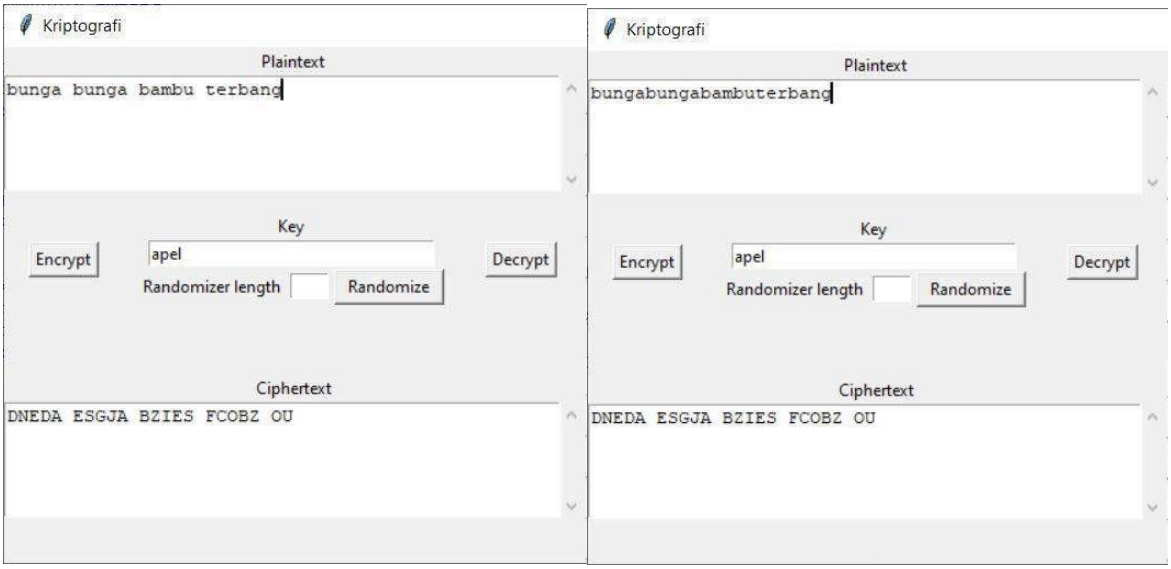
Pada pengujian pertama, digunakan plaintext “ibu mencuci baju di pasar” dengan key “jagung” yang dienkripsi dengan Full Vigenere Cipher kemudian didekripsi lagi.



Gambar 6. Pengujian Full Vigenere Cipher 1

Selanjutnya, digunakan input plaintext “bunga bunga bambu terbang” dengan key “apel” yang memberikan hasil sebagai berikut.

Dari hasil yang diperoleh, terlihat bahwa proses enkripsi-

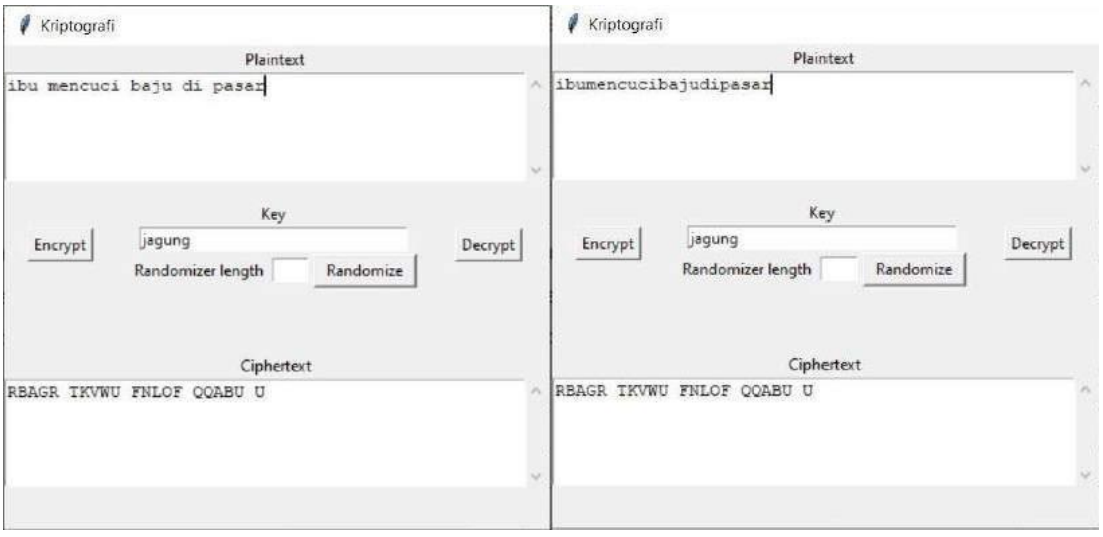


Gambar 7. Pengujian Full Vigenere Cipher 2

dekripsi yang terjadi berjalan dengan baik, hanya saja terjadi kehilangan informasi pada teks selain alfabet (seperti spasi). Hal ini sudah sesuai dengan spesifikasi yang diharapkan.

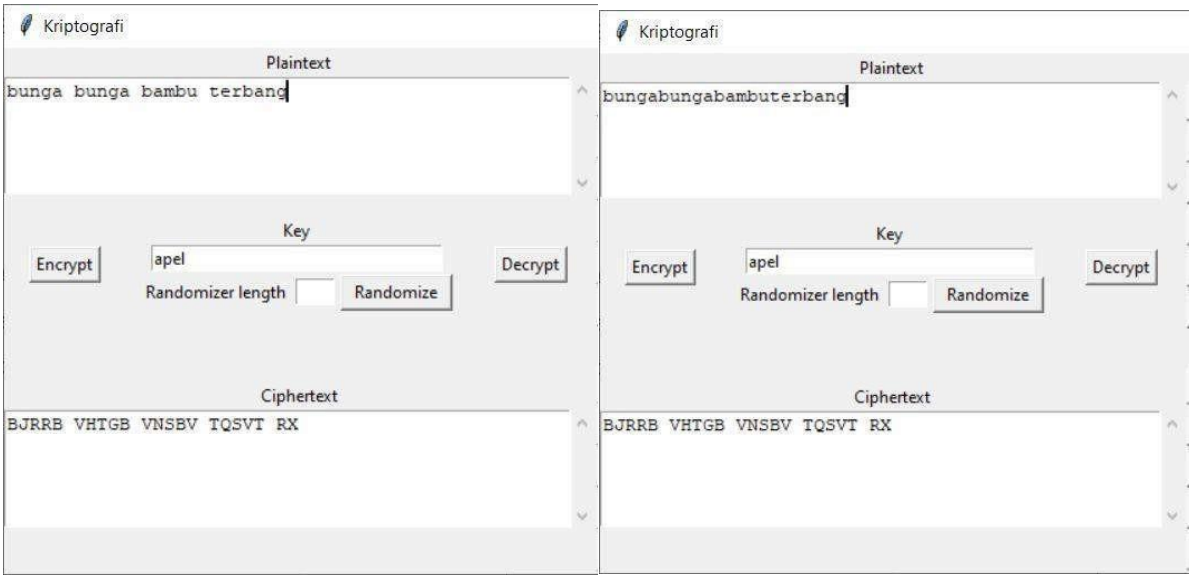
Pengujian Auto Key Vigenere Cipher

Pada pengujian pertama, digunakan plaintext “ibu mencuci baju di pasar” dengan key “jagung” yang dienkripsi dengan Auto Key Vigenere Cipher kemudian didekripsi lagi.



Gambar 8. Pengujian Auto Key Vigenere Cipher 1

Dari hasil yang diperoleh, terlihat bahwa proses enkripsi-dekripsi yang terjadi berjalan dengan
Selanjutnya, digunakan input plaintext “bunga bunga bambu terbang” dengan key “apel” yang memberikan hasil sebagai berikut.

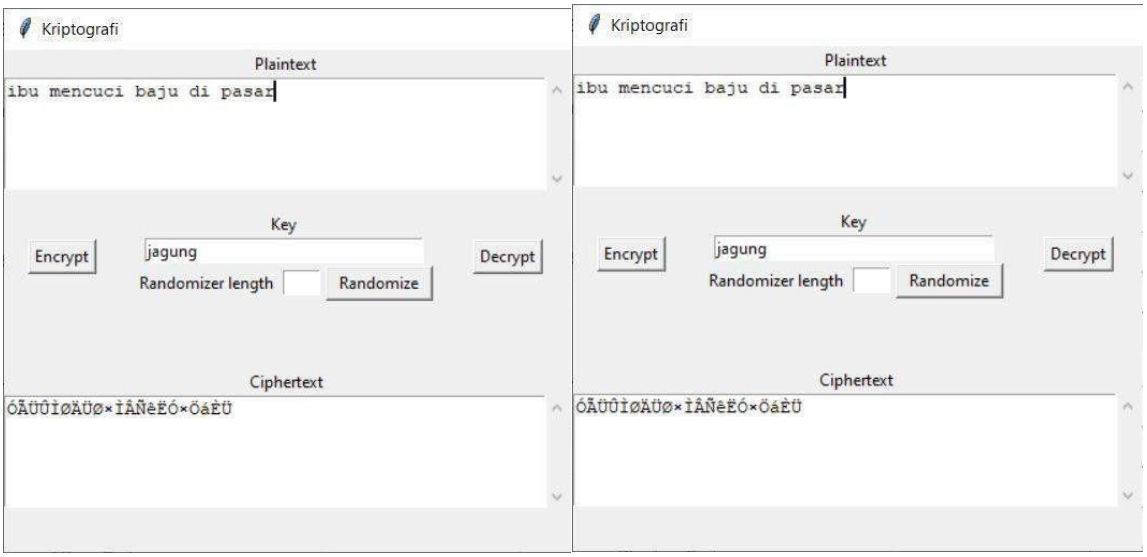


Gambar 10. Pengujian Auto Key Vigenere Cipher 2

baik, hanya saja terjadi kehilangan informasi pada teks selain alfabet (seperti spasi). Hal ini sudah sesuai dengan spesifikasi yang diharapkan.

Pengujian Extended Vigenere Cipher

Untuk pengujian Extended Vigenere Cipher pertama dilakukan dengan melakukan input pada GUI program yang dibuat, dengan mengisi bagian plaintext dan key kemudian melakukan enkripsi-dekripsi seperti biasa. Digunakan plaintext “ibu mencuci baju di pasar” dengan key “jagung” yang dienkripsi dengan Extended Vigenere Cipher kemudian didekripsi lagi.



Dari hasil yang diperoleh, terlihat bahwa proses enkripsi-

Gambar 10. Pengujian Extended Vigenere Cipher 1

Selanjutnya, dilakukan pengujian pada file binary. Digunakan plaintext yang sama yaitu “ibu mencuci baju di pasar” dengan key “jagung” yang dienkripsi dengan Extended Vigenere Cipher kemudian didekripsi lagi.

Gambar 11. Pengujian Extended Vigenere Cipher 2

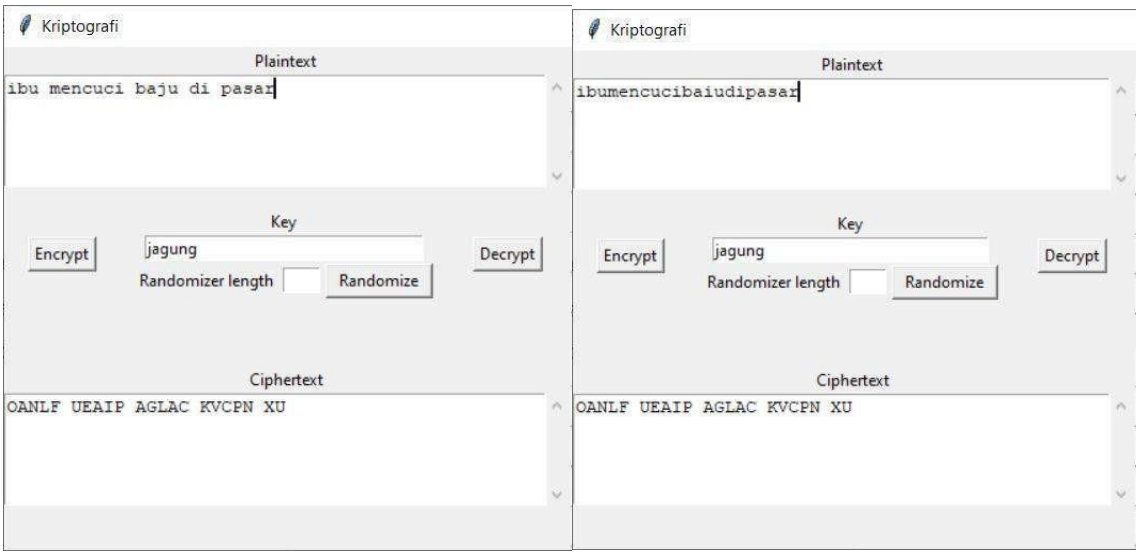
Dari hasil yang diperoleh, terlihat bahwa proses enkripsi-dekripsi yang terjadi berjalan cukup baik, masih terdapat sedikit masalah pada enkripsi-dekripsi biasa dimana terdapat 32 karakter ASCII hasil enkripsi yang tidak dapat ditampilkan (*not printable*) sehingga memengaruhi proses

dekripsi yang terjadi berjalan dengan

dekripsi (rentan salah). Keunggulan chiper ini adalah proses enkripsi tidak menghilangkan karakter selain abjad, sehingga karakter seperti spasi dan tanda baca dapat terbaca (dekripsi) dengan baik.

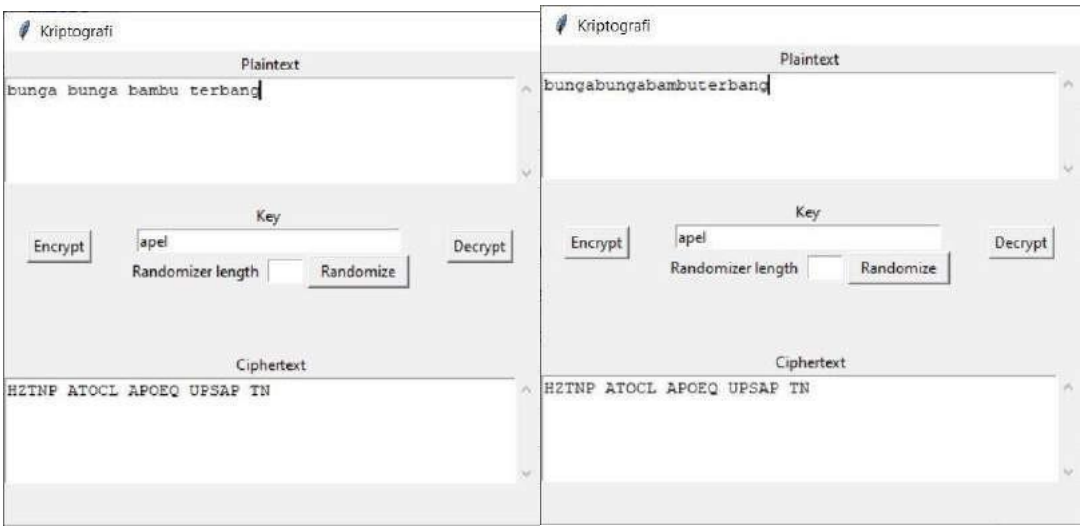
Pengujian Playfair Cipher

Pada pengujian pertama, digunakan plaintext “ibu mencuci baju di pasar” dengan key “jagung” yang dienkripsi dengan Playfair Cipher kemudian didekripsi lagi.



Gambar 12. Pengujian Playfair Cipher 1

Selanjutnya, digunakan input plaintext “bunga bunga bambu terbang” dengan key “apel” yang memberikan hasil sebagai berikut.

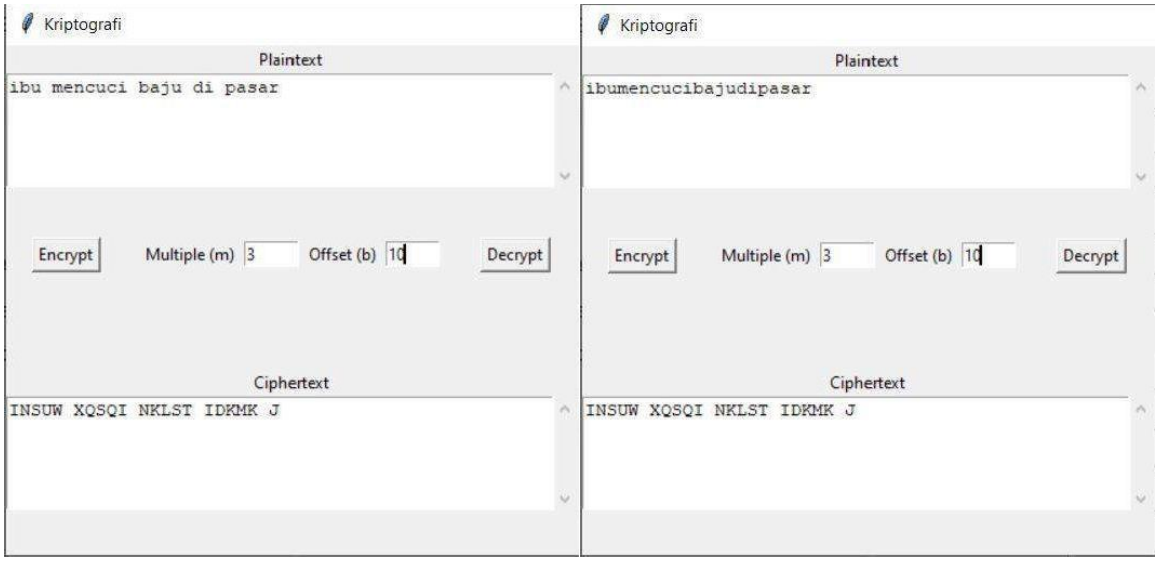


Gambar 13. Pengujian Playfair Cipher 2

Dari hasil yang diperoleh, terlihat bahwa proses enkripsi-
baik, hanya saja terjadi kehilangan informasi pada teks selain alfabet (seperti spasi), dan kehilangan informasi mengenai huruf ‘j’ pada plainteks (diganti dengan huruf ‘i’). Hal ini sudah sesuai dengan spesifikasi yang diharapkan.

Pengujian Affine Cipher

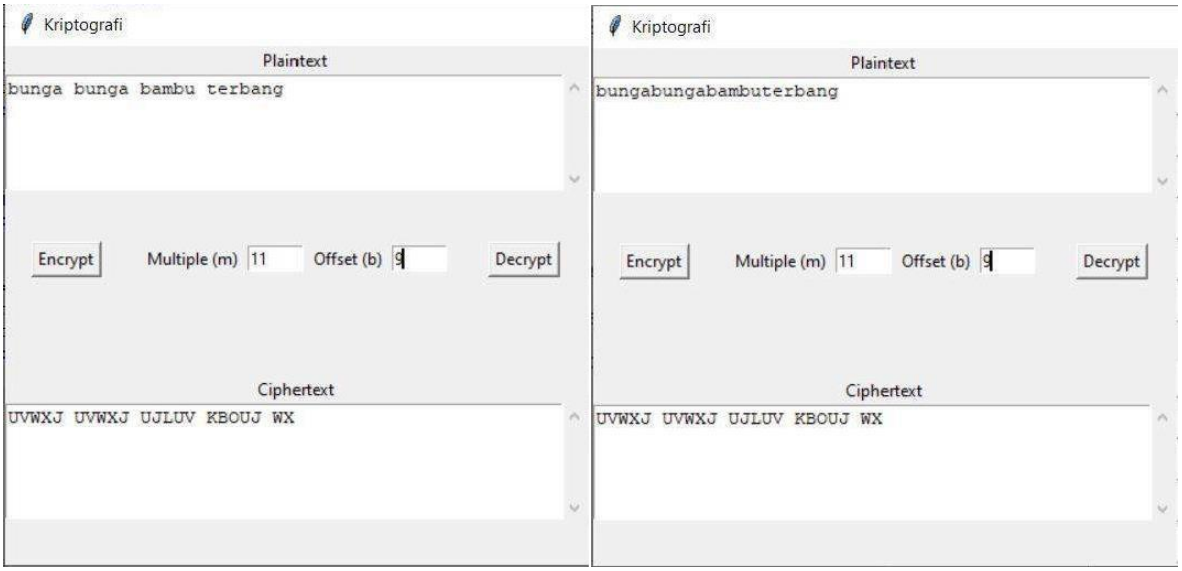
Pada pengujian pertama, digunakan plaintext “ibu mencuci baju di pasar” dengan m = 3 dan b = 10 yang dienkripsi dengan Affine Cipher kemudian didekripsi lagi.



Gambar 14. Pengujian Affine Cipher 1

Selanjutnya, digunakan input plaintext “bunga bunga bambu terbang” dengan m = 11 dan b = 9 yang memberikan hasil sebagai berikut.

dekripsi yang terjadi berjalan dengan



Gambar 15. Pengujian Affine Cipher 2

Dari hasil yang diperoleh, terlihat bahwa proses enkripsi-dekripsi yang terjadi berjalan dengan baik, hanya saja terjadi kehilangan informasi pada teks selain alfabet (seperti spasi). Hal ini sudah sesuai dengan spesifikasi yang diharapkan.

4. Link Ke GitHub

https://github.com/Najwar09/Tugas1-202018-Muh.-Najwar-Ramadhan-5TKKO-E

5. Keterangan Keberhasilan Program

NO	SPEK	Berhasil (V)	Kurang berhasil (V)	Keterangan
1	Vigenere Cipher			
2	Enigma Cipher			
3	Auto-Key Vigenere Cipher			
4	Extended Vigenere Cipher			Terdapat 32 karakter ASCII yang tidak dapat ditampilkan, membuat proses dekripsi rentan salah (dapat ditingkatkan melalui penyimpanan enkripsi dengan *file of bytes*), untuk file binary ekstensi hanya .bin
5	Playfair Cipher			
6	Bonus: Affine Cipher			