



Faculty of Engineering and Technology
Electrical and Computer Engineering Department

ENCS4370

Computer Architecture

Project #1

Testcases Explanation

Name: Shahd Abu-Daghash

Number: 1191448

Name: Mazen Batrawi

Number: 1190102

Instructor: Dr. Aziz Qaroush

Section: 2

Date: 28-12-2022

Testcase #1:

This testcase of the file “testcase1_toEncrypt.txt”. Opening the file, what is seen is two small paragraphs about Electronic Code Book encryption. The text contains uppercase letters, lowercase letters, special characters, and a lot of spaces.

When the program is executed to encrypt this file following is what appears in the console. Notice that the same text in the last part is saved to the file out.txt.

```
Please select your option:
( e ) for encryption
( d ) for decryption
Your choice is: e
Please input the name of the plain text file: testcase1_toEncrypt.txt

The content of the file is:
Electronic Code Book (ECB) is a simple mode of operation with a block cipher that's
mostly used with symmetric key encryption.
It is a straightforward way of processing a series of sequentially listed message blocks.

The input plaintext is broken into numerous blocks. The blocks are individually and independently
encrypted (ciphertext) using the encryption key.
As a result, each encrypted block can also be decrypted individually. ECB can
support a separate encryption key for each block type.

The content of the file after filtering is:
electronic code book ecb is a simple mode of operation with a block cipher thats mostly used with
symmetric key encryption
it is a straightforward way of processing a series of sequentially listed message blocks

the input plaintext is broken into numerous blocks the blocks are individually and independently
encrypted ciphertext using the encryption key
as a result each encrypted block can also be decrypted individually ecb can support a separate
encryption key for each block type

The maximum word length (The key) is: 15

The encrypted text is:
tatrigdcxr rdst qddz trq xh p hxbeat bdst du detgpixdc lxiw p qadrz rxewtg iwpih bdhian jhts lxiw
hnbbtigxr ztn tcrgneixdc
xi xh p higpxvwiudglpgs lpn du egdrthxcv p htgxth du htftjcixpaan axhits bthhpvt qadrzh

iwt xceji eapxcitmi xh qgdztc xcid cjbtdgjh qadrzh iwt qadrzh pgt xcsxkxsjpaan pcs xcstetctscian
tcrgneits rxewtgitmi jhxcv iwt tcrgneixdc ztn
ph p gthjai tprw tcrgneits qadrz rpc pahd qt strgneits xcsxkxsjpaan trq rpc hjeedgi p htepgpit
tcrgneixdc ztn udg tprw qadrz inet

Please enter the output file name: out.txt

The text is successfully saved in the file.

-- program is finished running --
```

In the previous run, the file is read as it is. Then, the special characters [(),'] are removed along with the extra spaces seen in the file. After that, all letters are converted to lowercase letters.

Afterwards, the maximum word length is found to be 15, which is the length of the word “straightforward”. This will be the shift amount done for the encryption.

Now, comes the encryption process using the shifting amount of 15. Here are some examples:

- The first letter “e” is encrypted to “t”, the ascii for them are 101 and 116 respectively, with a difference of 15
- The word “with” is encrypted to be “lxiw”. Looking at each pair of letters, we find that the difference between the ascii characters is 15

Testcase #2

The second testcase is the file “testcase2_toDecrypt.txt”. This file contains a ciphertext that was previously encrypted with a shifting value of the longest word in the file. Therefore, using the decryption of the same procedure will help us understand the content of the file.

Running the decryption process in the program gives the following result.

```
Please select your option:
( e ) for encryption
( d ) for decryption
Your choice is: d
Please input the name of the cipher text file: testcase2_toDecrypt.txt

The content of the file is:
p sr bdidg lxiw p bpvtixr tcrdstg xh p inet du sr bdidg iwpi wph p qjxaixc htchdg iwpi btphjgth
iwt gdipixdcpa edhxixdc du iwt bdidg hwpui
iwt htchdg jhth bpvtixrpaan tcrdsts sxhrh dg gxcvh piiprwts id iwt bdidg hwpui id vtctgpit p
htgxth du ejahth iwpi rdgghedcs id iwt edhxixdc du
iwt hwpui

p bpvtixr tcrdstg rpc qt jhts id egdkxst egtrxht uttsqprz dc iwt edhxixdc pcs hetts du iwt bdidg
lwrxw rpc qt jhts id rdcigda iwt bdidg bdgt
prjgpitan pcs prwxtkt wxvwtg atktah du egtrhxdc udg tmpbeat p sr bdidg lxiw p bpvtixr tcrdstg
rdjas qt jhts xc p gdqdir pgb id egtrxhtan
rdcigda iwt edhxixdc du iwt pgb dg xc p s egxcitg id prjgpitan rdcigda iwt bdkbtci du iwt egxci
wtps

id jht p sr bdidg lxiw p bpvtixr tcrdstg ndj lxaa ctts id rdctri iwt tcrdstg id p rdcigdaatg
iwpi rpc xcitgegti iwt ejahth hvcpah pcs jht iwtb
id rdcigda iwt bdidg iwxh rpc qt sdct jhxcv p bxrgdrdcigdaatg hjrw ph pc pgsjxcd dg p stsxrpits
bdidg rdcigda qdpgs iwt rdcigdaatg lxaa inextrpaan
wpkt p ejahth lxsiw bdsjapixdc elb xceji udg rdcigdaaxcv iwt hetts du iwt bdidg pcs sxvxipa xcejih
udg rdcigdaaxcv iwt sxgtrixdc du iwt
bdidg

The maximum word length (The key) is: 15

The decrypted text is:
a dc motor with a magnetic encoder is a type of dc motor that has a builtin sensor that measures
the rotational position of the motor shaft
the sensor uses magnetically encoded discs or rings attached to the motor shaft to generate a
series of pulses that correspond to the position of
the shaft

a magnetic encoder can be used to provide precise feedback on the position and speed of the motor
which can be used to control the motor more
accurately and achieve higher levels of precision for example a dc motor with a magnetic encoder
could be used in a robotic arm to precisely
control the position of the arm or in a d printer to accurately control the movement of the print
head
```

```
to use a dc motor with a magnetic encoder you will need to connect the encoder to a controller
that can interpret the pulse signals and use them
to control the motor this can be done using a microcontroller such as an arduino or a dedicated
motor control board the controller will typically
have a pulse width modulation pwm input for controlling the speed of the motor and digital inputs
for controlling the direction of the
motor
```

```
Please enter the output file name: out.txt
```

```
The text is successfully saved in the file.
```

```
-- program is finished running --
```

Notice that, the resulting text is understandable, and now we know it talks about the DC Motor with Magnetic Encoder.