Base64 Encoder Documentation

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Introduction

This document is designed to provide information on the process, algorithm and code analysis of the base64 encoder. This document will consist of the following:

- Areas of research
- Algorithm
- Code Analysis
- Testing

Areas of research

Lifewire Website

This website was used to provide information on the process required to turn an ASCII text set into a base 64. The website helped to understand what the input and output of the encoding program will be. The information taken from this website helped to create an algorithm for later use.

https://www.lifewire.com/base64-encoding-overview-1166412

Base64encode Website

This website was used in order to provide evidence for all my base 64 encoded calculations. Provides both encoding and decoding options upon the website with a brief description on how to go about encoding from ASCII into base 64.

https://www.base64encode.org/

Rene Nyffenegger Website

This website provided a source code for a base 64 encoder in C++. This source code helped to provide an understanding of how other individuals programmed a base 64 encoder efficiently. The code also provided an understanding of a base 64 encoder in practise.

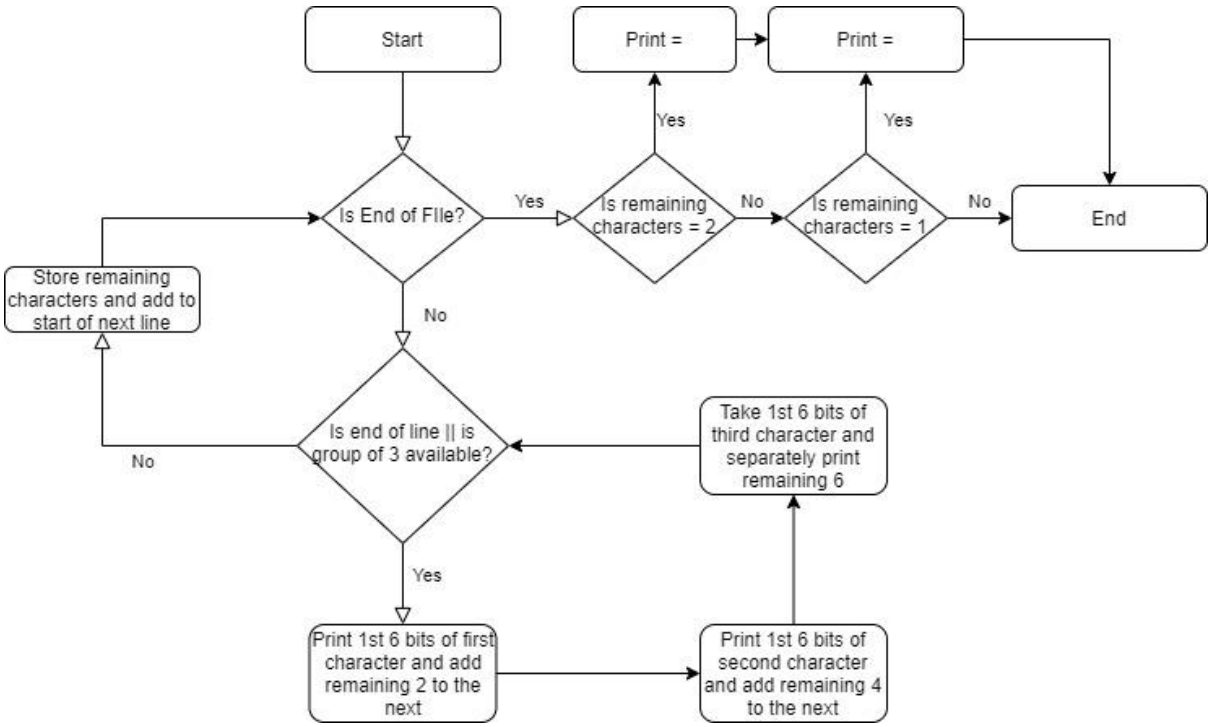
https://renenyffenegger.ch/notes/development/Base64/Encoding-and-decoding-base-64-with-cpp

CPlusPlus Website

This website helped to provide an understanding of file handling using C++ that would be used to help take data from a text file.

http://www.cplusplus.com/doc/tutorial/files/

Algorithm



Code Analysis

For full code, see attached cpp file.

Upon commencing the program, the program will firstly request for a file path of a text file suitable for encoding. A while loop will commence until a valid file path is provided. If the file path is valid, a while loop will run through each line of the text file. From here a for loop will run through the line, going through each character in groups of three (passing any leftovers onto the next line). Each group will go through a process identical to the algorithm provided above. When all lines of the text file have been encoded, = signs will be printed for each leftover character from the process.

Once this process has been completed the program will ask if the user would like to encode another text file, if yes then the process will repeat, otherwise will exit.

Testing

Test No.	*Description*	*Variables*	*Pass/Fail*	*Improvements*
1	Incorrect File Location Test	“FalseFileLocation”	Pass	N/A
2	Correct File Location Test	“C:\Users\thoma\Desktop\Test.txt”	Pass	N/A
3	Encoding Single Line	“Man”	Pass	N/A
4	Encode Long Single Line	“This is a Man”	Pass	N/A

5	Encoding Multiple Lines	“This is a Man” “This is a Woman” “These are their Children”	Pass	N/A
6	Incorrect Restart Loop Request	“Incorrect Entry”	Pass	N/A
7	Restart Loop Request	“Y”	Pass	N/A
8	Reject Restart Loop Request	“N”	Pass	N/A

Test 1

```
This program is designed to convert a set of text from a text file into base 64 for email

-----------------------------------------

Enter File Location of :
FalseFileLocation
```

```
FalseFileLocation
Unable to open file
Enter File Location of :
```

Test 2

```
Enter File Location of :
C:\Users\thoma\Desktop\Test.txt
```


```
QWNjb3JkaW5nIHRvIGFsbCBrbm93biBsYXdzIG9mIGF2aWF0aW9uLCB0aGVyZSBpcyBubyB3YXkgYSBiZWUgc2hvdWxkIGJlIGFibGUgdG8gZmx5Lk10cyB3
aW5ncyBhcmUgdG9vIHNtYWxsIHRvIGdldCBpdHMgZmF0IGxpdHRsZSBiR5IG9mZiB0aGUgZ3JvdW5kLlRoZSBiZWUsIG9mIGNvdXJzZSwgZmxpZXMgYW55
d2F5IGJlY2F1c2UgYmVlcyBkb24ndCBjYXJlIHdoYXQgaHVtYW5zIHRoaW5rIGlzIGltcG9zc2libGUuWWVsbG93LCBibGFjay4gWWVsbG93LCBibGFjay4g
WWVsbG93LCBibGFjay4gWWVsbG93LCBibGFjay5Pb2gsIGJsYWNrIGFuZCB5ZWxsb3chTGV0J3Mgc2hha2UgaXQgdXAgYSBsaXR0bGUuQmFycnkhIEJyZWFr
ZmFzdCBpcyByZWFkeSFDb21pbmchSGFuZyBvbiBhIHNlY29uZC5Vc2UgdGhlIHN0YWlycywgWW91ciBmYXRoZXIgcGFpCBmbHlpbmcgaW4gdGhlIGhhcHBlbmluZz9J
IGNhbid0LkknbGwgcGljayB5b3UgdXAuTG9va2luZyBzaGFycC5Vc2UgdGhlIHN0YWlycywgW91ciBmYXRoZXIgcGFpZCBnb29kIG1vbmV5IGZvciB0aG9z
ZS5Tb3JyeS4gSSdtIGV4Y2l0ZWQuSGVyZSdzIHRoZSBncmFkdWF0ZS5XZSdyZSB2ZXJ5IHByb3VkIG9mIHlvdSwgc29uLkEgcGVyZmVjdCByZXBvcnQgY2Fy
ZCwgYWxsIEIncy5WZXJ5IHByb3VkLk1hISBJIGdvdCBhIHRoaW5nIGdvaW5nIGhlcmUuWW91IGdvdCBsaW50IG9uIHlvdXIgZnV6ei5PdyEgVGhhdCdzIG1l
IVdhdmUgdG8gdXMhIFdlJ2xsIGJlIGluIHJvdyAxMTgsMDAwLkJ5ZSFCYXJyeSwgSSB0b2xkIHlvdSwgc3RvcCBmHlpbmcgaW4gdGhlIGhvdXNlIUhleSwg
QWRhbS5IZXksIEJhcnJ5LklzIHRoYXQgZnV6eiBnZWw/QSBsaXR0bGUuIFNwZWNpYWwgZGF5LCBncmFkdWF0aW9uLk5ldmVyIHRob3VnaHQgSSdkIG1ha2Ug
aXQuVGhyZWUgZGF5cyBncmFkZSBzY2hvb2wsIHRocmVlIGRheXMgaGlnaCBzY2hvb2wuVGhvc2Ugd2VyZSBhd2t3YXJkLlRocmVlIGRheXMgY29sbGVnZS4g
SSdtIGdsYWQgSSB0b29rIGEgZGF5IGFuZCBoaXRjaGhpa2VkIGFyb3VuZCBUaGUgSGl2ZS5Zb3UgZGlkIGNvbWUgYmFjayBkaWZmZXJlbnQuSGksIEJhcnJ5
LiBBcnRpZSwgZ3Jvd2luZyBhIG11c3RhY2hlPyBMb29rcyBnb29kLkhlYXIgYWJvdXQgRnJhbmtpZT9ZZWFoLllvdSBnb2luZyB0byB0aGUgZnVuZXJhbD9O
bywgSSdtIG5vdCBnb2luZy5FdmVyeWJvZHka25vd3MsIHN0aW5nIHIHlvdSBkaWUuRG9uJ3Qgd2FzdGUgaXQgb24gYSBzcXVpcnJlbC5TdWNo
IGEgaG90aGVhZC5JIGd1ZXNzIGhlIGNvdWxkIGhhdmUganVzdCBnb3R0ZW4gb3V0IG9mIHRoZSB3YXkuSSBsb3ZlIHRoaXMgaW5jb3Jwb3JhdGluZyBhbiBh
bXVzZW1lbnQgcGFyayBpbnRvIG91ciBkYXkuVGhhdCdzIHdoeSB3ZSBkb24ndCBuZWVkIHZhY2F0aW9ucy5Cb3ksIHF1aXRlIGEgYml0IG9mIHBvbXAgdW5k
ZXIgdGhlIGNpcmN1bXN0YW5jZXMuV2VsbCwgQWRhbSwgdG9kYXkgd2UgYXJlIG1lbi5XZSBhcmUhQmVlLW1lbi5BbWVuIUhhbGxlbHVqYWghU3R1ZGVudHMs
IGZhY3VsdHksIGRpc3Rpbmd1aXNoZWQgYmVlcyxwbGVhc2Ugd2VsY29tZSBEZWFuIEJ1enp3ZWxsLldlbGNvbWUsIE5ldyBIaXZlIENpdHkgZ3JhZHVhdGlu
ZyBjbGFzcyBvZiA5OjE1LlRoYXQgY29uY2x1ZGVzIG91ciBjZXJlbW9uaWVzIEFuZCBiZWdpbnMgeW91ciBjYXJlZXIgYXQgSG9uZXggSW5kdXN0cmllcyFX
aWxsIHdlIHBpY2sgb3VyIGpvYiB0b2RheT9JIGhlYXJkIGl0J3MganVzdCBvcmllbnRhdGlvbi5IZWFkcyB1cCEgSGVyZSB3ZSBnby5LZWVwIHlvdXIgaGFu
ZHMgYW5kIGFuZGVubmEzIGluc2lkZSB0aGUgdHJhbSBhdCBhbGwgdGltZXMuV29uZGVyIHdoYXQgaXQnbGwgYmUgbGlrZT9BIGxpdHRsZSBzY2EyeS5XZWxi
```


The above Base64 encoder is of a set of text contained within Test.txt at the given file location

Test 3

```
This program is designed to convert a set of text from a text file into base 64 for email

----------------------------------------

Enter File Location of :
C:\Users\thoma\Desktop\Test.txt
TWFu

----------------------------------------

Would you like to try a different file? (y/n)
```

Test 4

```
----------------------------------------

Enter File Location of :
C:\Users\thoma\Desktop\Test.txt
VGhpcyBpcyBhIE1hb==


----------------------------------------
```

Test 5

```
----------------------------------------

Enter File Location of :
C:\Users\thoma\Desktop\Test.txt
VGhpcyBpcyBhIE1hblRoaXMgaXMgYSBXb21hblRoZXNlIGFyZSB0aGVpciBjaGlsZHJlA==


----------------------------------------
```

Test 6

```
Would you like to try a different file? (y/n)
IncorrectEntry
Unknown response
Would you like to try a different file? (y/n)
```

Test 7

```
Would you like to try a different file? (y/n)
y
Enter File Location of :
```

NOTE: when entering a file location after Test 7, the program crashed when encoding. This was because when the repeated program occurred, the global variables were not reset. This has been fixed as shown below

```
base64_count = 6, leftover = "";
while (getline(myfile, line))//lo
    base64_Creator(line);
```

Test 8

```
Would you like to try a different file? (y/n)
n

C:\Users\thoma\OneDrive - Queen's University Belfast\Maths_And_Algorithms\Laboratory_Practicals\BinaryEncoder\x64\Debug\
BinaryEncoder.exe (process 4308) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the conso
le when debugging stops.
Press any key to close this window . . .
```