CAB201 Programming Principles - Semester 2, 2019 Report for Assignment: Project – Genomic Sequence Retrieval - Part I

Student name and number:

Callum McNeilage n10482652

Build and Run Instructions

Please provide clear step-by-step instructions here on how to build your program in Visual Studio and run your program in the command line, given your submitted zip folder. For each step, you should include a screenshot. You may expand the box if needed.

Step 1: The solution file is located on the same directory level as this report file. Click on the .sln file to open in Visual Studio.

Step 2: Go to the top tool bar and select Build -> Build Solution

Step 3: Navigate to Search16s -> Search16s -> bin -> Debug -> netcoreapp3.0 and look for the Search 16s.exe file

Step 4: Open command prompt by typing ‘cmd’ into search on taskbar

Step 5: Navigate to ‘netcoreapp3.0’ by typing ‘cd’ and dragging the netcoreapp3.0 link from the filepath to command prompt to automatically get the system file path

Step 6: Run the program by typing ‘start Search16s.exe’ followed by the desired command

Statement of Completeness

This statement of completeness will need to *accurately* state the functionality which has been implemented. There will be a penalty of 3.5 marks (loss of 3.5 marks) for a non-completed or submitted statement of completeness, and a penalty of 1 mark for each inaccurate statement to a maximum of 3 marks.

In the following section, you are required to mark which functionality you have implemented. <u>In the column on the right please mark 'Y' where you have completed this functionality, and 'N' where you have not</u>. Please fill in any additional text boxes requested, and please note any limitations or bugs in the box at the end of each section. You may expand the table if you need more room for comments.

Basic Functionality		
Basic itinerary output	The program displays the data from the file	Y
	The program displays the appropriate line	Y
	The correct amount of information is displayed, e.g. only the relevant entries	Y
	The correct level, provided as a command line flag **-*levelN***, is executed	Y
	The program **does not** store the whole file in memory, instead it accesses the file on disk	N
Error handling	A clear error message is displayed when an incorrect number of arguments is provided	Y
	A clear error message is provided when an incorrect flag is provided (e.g. not -level1, etc.)	Y
	A clear error message is provided when the input file doesn't exist, or is incorrectly formatted	Y
Comments	*Was not able to implement TryParse on args variables for level 1. As a result, if user types alphabetic characters in the args[2] and args[3] variables the program will crash*	

Searching Algorithm – Part I

Please underline, circle or highlight the levels that were completed.

Algorithm	**Level:** Level 1, level 2, level 3
Comments	*Was not able to implement TryParse on args variables for level 1. As a result, if user types alphabetic characters in the args[2] and args[3] variables the program will crash*

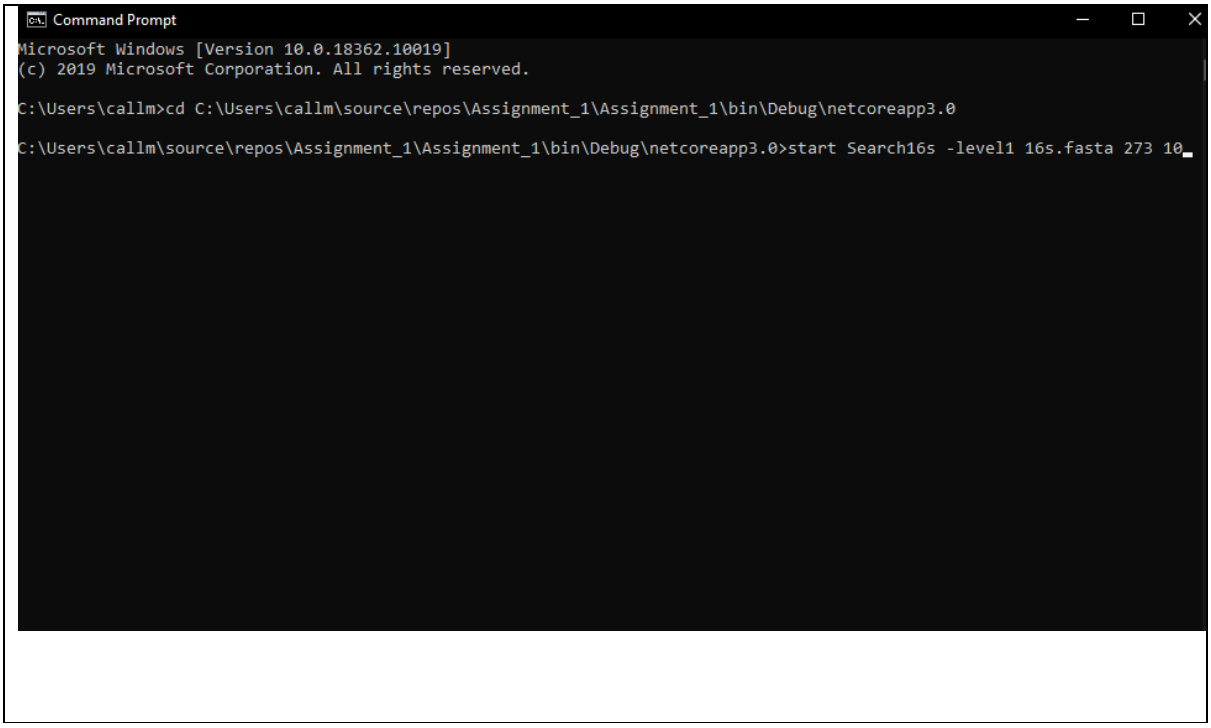
Screenshots of Functionality

In the following section, you are required to provide screenshots that provide evidence of your program working with provided input. You must complete this section.

1) The `16S.fasta file` has been provided with this template. Download them and place them in the same folder as your .exe file. You may have extra files, e.g. a query file, in this folder, and your .exe may be named differently. This is fine.

2) Open the command prompt and go to the above folder. In the command line, type the name of the .exe file and copy and paste following arguments:

```
Search16s -level1 16s.fasta 273 10
```

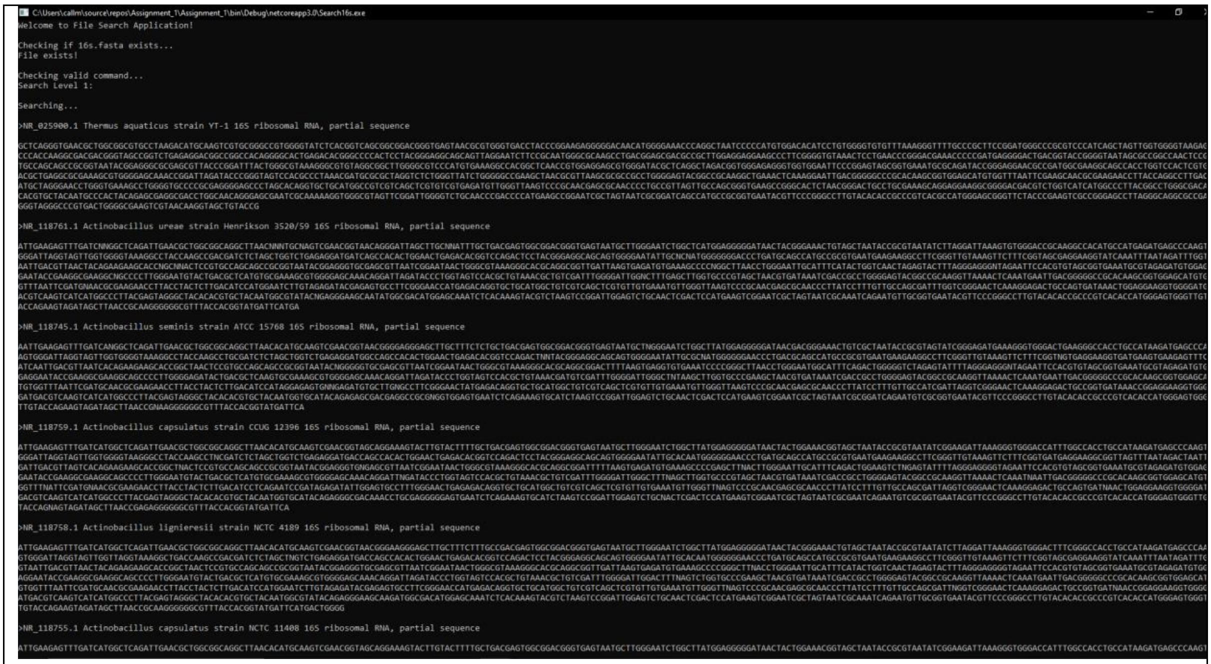


```
Microsoft Windows [Version 10.0.18362.10019]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\callm>cd C:\Users\callm\source\repos\Assignment_1\Assignment_1\bin\Debug\netcoreapp3.0

C:\Users\callm\source\repos\Assignment_1\Assignment_1\bin\Debug\netcoreapp3.0>start Search16s -level1 16s.fasta 273 10
```

3) Hit enter to run your program.



C:\Users\callm\source\repos\Assignment_1\Assignment_1\bin\Debug\netcoreapp3.0\Search16s.exe

```
Welcome to File Search Application!

Checking if 16s.fasta exists...
File exists!

Checking valid command...
Search Level 1:

Searching...

>NR_025900.1 Thermus aquaticus strain YT-1 16S ribosomal RNA, partial sequence

GCTCAGGGTGAACGCTGGCGGCGTGCCTAAGACATGCAAGTCGTGCGGGCCGTGGGGTATCTCACGGTCAGCGGCGGACGGGTGAGTAACGCGTGGGTGACCTACCCGGAAGAGGGGGACAACATGGGGAAACCCAGGCTAATCCCCCATGTGGACACATCCTGTGGGGTGTGTTTAAAGGGTTTTGCCCGCTTCCGGATGGGCCCGCGTCCCATCAGCTAGTTGGTGGGGTAAGAG
CCCACCAAGGCGACGACGGGTAGCCGGTCTGAGAGGACGGCCGGCCACAGGGGCACTGAGACACGGGCCCCACTCCTACGGGAGGCAGCAGTTAGGAATCTTCCGCAATGGGCGCAAGCCTGACGGAGCGACGCCGCTTGGAGGAGGAAGCCCTTCGGGGTGTAAACTCCTGAACCCGGGACGAAACCCCCGATGAGGGGACTGACGGTACCGGGGTAATAGCGCCGGCCAACTCCG
TGCCAGCAGCCGCGGTAATACGGAGGGCGCGAGCGTTACCCGGATTTACTGGGCGTAAAGGGCGTGTAGGCGGCTTGGGGCGTCCCATGTGAAAGGCCACGGCTCAACCGTGGAGGAGCGTGGGATACGCTCAGGCTAGACGGTGGGAGAGGGTGGTGGAATTCCCGGAGTAGCGGTGAAATGCGCAGATACCGGGAGGAACGCCGATGGCGAAGGCAGCCACCTGGTCCACTCGTG
ACGCTGAGGCGCGAAAGCGTGGGGAGCAAACCGGATTAGATACCCGGGTAGTCCACGCCCTAAACGATGCGCGCTAGGTCTCTGGGTTATCTGGGGGCCGAAGCTAACGCGTTAAGCGCGCCGCCTGGGGAGTACGGCCGCAAGGCTGAAACTCAAAGGAATTGACGGGGGCCCGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCAACGCGAAGAACCTTACCAGGCCTTGAC
ATGCTAGGGAACCTGGGTGAAAGCCTGGGGTGCCCCGCGAGGGGAGCCCTAGCACAGGTGCTGCATGGCCGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCCTGCCGTTAGTTGCCAGCGGGTGAAGCCGGGCACTCTAACGGGACTGCCTGCGAAAGCAGGAGGAAGGCGGGGACGACGTCTGGTCATCATGGCCCTTACGGCCTGGGCGACA
CACGTGCTACAATGCCCACTACAGAGCGAGGCGACCTGGCAACAGGGAGCGAATCGCAAAAAGGTGGGCGTAGTTCGGATTGGGGTCTGCAACCCGACCCCATGAAGCCGGAATCGCTAGTAATCGCGGATCAGCCATGCCGCGGTGAATACGTTCCCGGGCCTTGTACACACCGCCCGTCACGCCATGGGAGCGGGTTCTACCCGAAGTCGCCGGGAGCCTTAGGGCAGGCGCCGA
GGGTAGGGCCCGTGACTGGGGCGAAGTCGTAACAAGGTAGCTGTACCG

>NR_118761.1 Actinobacillus ureae strain Henrikson 3520/59 16S ribosomal RNA, partial sequence

ATTGAAGAGTTTGATCNNGGCTCAGATTGAACGCTGGCGGCAGGCTTAACNNNTGCNAGTCGAACGGTAACAGGGATTAGCTTGCNNATTTGCTGACGAGTGGCGGACGGGTGAGTAATGCTTGGGAATCTGGCTCATGGAGGGGGATAACTACGGAAACTGTAGCTAATACCGCGTAATATCTTAGGATTAAAGTGTGGGACCGCAAGGCCACATGCCATGAGATGAGCCCAAGT
GGGATTAGGTAGTTGGTGGGGTAAAGGCCTACCAAGCCGACGATCTCTAGCTGGTCTGAGAGGATGATCAGCCACACTGGAACTGAGACACGGTCCAGACTCCTACGGGAGGCAGCAGTGGGGAATATTGCNCNATGGGGGGGACCCTGATGCAGCCATGCCGCGTGAATGAAGAAGGCCTTCGGGTTGTAAAGTTCTTTCGGTAGCGAGGAAGGTATCAAATTTAATAGATTTGGT
AATTGACGTTAACTACAGAAGAAGCACCNGCNNACTCCGTGCCAGCAGCCGCGGTAATACGGAGGGTGCGAGCGTTAATCGGAATAACTGGGCGTAAAGGGCACGCAGGCGGTTGATTAAGTGAGATGTGAAAGCCCCNGGCTTAACCTGGGAATTGCATTTCATACTGGTCAACTAGAGTACTTTAGGGAGGGNTAGAATTCCACGTGTAGCGGTGAAATGCGTAGAGATGTGGAG
GAATACCGAAGGCGAAGGCNGCCCCTTGGGAATGTACTGACGCTCATGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCTGTAAACGCTGTCGATTTGGGGATTGGNCTTTGAGCTTGGTGCCCGTAGCTAACGTGATAAATCGACCGCCTGGGGAGTACGGCCGCAAGGTTAAAACTCAAATGAATTGACGGGGGCCGCACAAGCGGTGGAGCATGTG
GTTTAATTCGATGNAACGCGAAGAACCTTACCTACTCTTGACATCCATGGAATCTTGTAGAGATACGAGAGTGCCTTCGGGAACCATGAGACAGGTGCTGCATGGCTGTCGTCAGCTCGTGTTGTGAAATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTATCCTTTGTTGCCAGCGATTTGGTCGGGAACTCAAAGGAGACTGCCAGTGATAAACTGGAGGAAGGTGGGGATG
ACGTCAAGTCATCATGGCCCTTACGAGTAGGGCTACACACGTGCTACAATGGCGTATACNGAGGGAAGCAATATGGCGACATGGAGCAAATCTCACAAAGTACGTCTAAGTCCGGATTGGAGTCTGCAACTCGACTCCATGAAGTCGGAATCGCTAGTAATCGCAAATCAGAATGTTGCGGTGAATACGTTCCCGGGCCTTGTACACACCGCCCGTCACACCATGGGAGTGGGTTGT
ACCAGAAGTAGATAGCTTAACCGCAAGGGGGGCGTTTACCACGGTATGATTCATGA

>NR_118745.1 Actinobacillus seminis strain ATCC 15768 16S ribosomal RNA, partial sequence

AATTGAAGAGTTTGATCANGGCTCAGATTGAACGCTGGCGGCAGGCTTAACACATGCAAGTCGAACGGTAACGGGAGGGAGCTTGCTTTCTCTGCTGACGAGTGGCGGACGGGTGAGTAATGCTNGGGAATCTGGCTTATGGAGGGGGATAACGACGGGAAACTGTCGCTAATACCGCGTAGTATCGGGAGATGAAAGGGTGGGACTGAAGGGCCACCTGCCATAAGATGAGCCCA
AGTGGGATTAGGTAGTTGGTGGGGTAAAGGCCTACCAAGCCTGCGATCTCTAGCTGGTCTGAGAGGATGGCCAGCCACACTGGAACTGAGACACGGTCCAGACTNNTACGGGAGGCAGCAGTGGGGAATATTGCGCNATGGGGGGAACCCTGACGCAGCCATGCCGCGTGAATGAAGAAGGCCTTCGGGTTGTAAAGTTCTTTCGGTNGTGAGGAAGGTGATGAAGTGAAGAGTTTC
ATCAATTGACGTTAATCACAGAAGAAGCACCGGCTAACTCCGTGCCAGCAGCCGCGGTAATACNGGGGGTGCGAGCGTTAATCGGAATAACTGGGCGTAAAGGGCACGCAGGCGGACTTTTAAGTGAGGTGTGAAATCCCCGGGCTTAACCTGGGAATGGCATTTCAGACTGGGGGTCTAGAGTATTTTAGGGAGGGNTAGAATTCCACGTGTAGCGGTGAAATGCGTAGAGATGTG
GAGGAATACCGAAGGCGAAGGCAGCCCCTTGGGGAGATACTGACGCTCAAGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCTGTAAACGATGTCGATTTGGGGATTGGGCTNTAAGCTTGGTGCCCGAAGCTAACGTGATAAATCGACCGCCTGGGGAGTACGGCCGCAAGGTTAAAACTCAAATGAATTGACGGGGGCCCGCACAAGCGGTGGAGCA
TGTGGTTTAATTCGATGCAACGCGAAGAACCTTACCTACTCTTGACATCCATAGGAGAGTGNNGAGATGTGCTTGNGCCTTCGGGAACTATGAGACAGGTGCTGCATGGCTGTCGTCAGCTCGTGTTGTGAAATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTATCCTTTGTTGCCATCGATTAGGTCGGGAACTCAAAGGAGACTGCCGGTGATAAACCGGAGGAAGGTGGG
GATGACGTCAAGTCATCATGGCCCTTACGAGTAGGGCTACACACGTGCTACAATGGTGCATACAGAGAGCGACGAGGCCGCGNGGTGGAGTGAATCTCAGAAAGTGCATCTAAGTCCGGATTGGAGTCTGCAACTCGACTCCATGAAGTCGGAATCGCTAGTAATCGCGGATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTACACACCGCCCGTCACACCATGGGAGTGGG
TTGTACCAGAAGTAGATAGCTTAACCGNAAGGGGGGCGTTTACCACGGTATGATTCA

>NR_118759.1 Actinobacillus capsulatus strain CCUG 12396 16S ribosomal RNA, partial sequence

ATTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCTTAACACATGCAAGTCGAACGGTAGCAGGAAAGTACTTGTACTTTTGCTGACGAGTGGCGGACGGGTGAGTAATGCTTGGGAATCTGGCTTATGGAGGGGGATAACTACTGGAAACGGTAGCTAATACCGCGTAATATCGGAAGATTAAAGGGTGGGACCATTTGGCCACCTGCCATAAGATGAGCCCAAGT
GGGATTAGGTAGTTGGTGGGGTAAGGGCCTACCAAGCCTNCGATCTCTAGCTGGTCTGAGAGGATGACCAGCCACACTGGAACTGAGACACGGTCCAGACTCCTACGGGAGGCAGCAGTGGGGAATATTGCACAATGGGGGGAACCCTGATGCAGCCATGCCGCGTGAATGAAGAAGGCCTTCGGGTTGTAAAGTTCTTTCGGTGATGAGGAAGGCGGTTAGTTTAATAGACTAATT
GATTGACGTTAGTCACAGAAGAAGCACCGGCTNACTCCGTGCCAGCAGCCGCGGTAATACGGAGGGTGNGAGCGTTAATCGGAATAACTGGGCGTAAAGGGCACGCAGGCGGATTTTTAAGTGAGATGTGAAAGCCCCGAGCTTNACTTGGGAATTGCATTTCAGACTGGAAGTCTNGAGTATTTTAGGGAGGGGTAGAATTCCACGTGTAGCGGTGAAATGCGTAGAGATGTGGAG
GAATACCGAAGGCGAAGGCAGCCCCTTGGGAATGTACTGACGCTCATGTGCGAAAGCGTGGGGAGCAAACAGGATTNGATACCCTGGTAGTCCACGCTGTAAACGCTGTCGATTTGGGGATTGGGCTTTNAGCTTGGTGCCCGTAGCTAACGTGATAAATCGACCGCCTGGGGAGTACGGCCGCAAGGTTAAAACTCAAATNAATTGACGGGGGCCCGCACAAGCGGTGGAGCATGT
GGTTTNATTCGATGNAACGCGAAGAACCTTACCTACTCTTGACATCCTCAGAATCCGATAGAGATATTGGAGTGCCTTTGGGAACTGAGAGACAGGTGCTGCATGGCTGTCGTCAGCTCGTGTTGTGAAATGTTGGGTTNAGTCCCGCAACGAGCGCAACCCTTATCCTTTGTTGCCAGCGATTAGGTCGGGAACTCAAAGGAGACTGCCAGTGATNAACTGGAGGAAGGTGGGGAT
GACGTCAAGTCATCATGGCCCTTACGAGTAGGGCTACACACGTGCTACAATGGTGCATACAGAGGGCGACAAACCTGCGAGGGGGAGTGAATCTCAGAAAGTGCATCTAAGTCCGGATTGGAGTCTGCNACTCGACTCCATGAAGTCGGAATCGCTAGTAATCGCGAATCAGAATGTCGCGGTGAATACGTTCCCGGGCCTTGTACACACCGCCCGTCACACCATGGGAGTGGGTTG
TACCAGNAGTAGATAGCTTAACCGAGAGGGGGGCGTTTACCACGGTATGATTCA

>NR_118758.1 Actinobacillus lignieresii strain NCTC 4189 16S ribosomal RNA, partial sequence

ATTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCTTAACACATGCAAGTCGAACGGTAACGGAAGGGAGCTTGCTTTCTTTGCCGACGAGTGGCGGACGGGTGAGTAATGCTTGGGAATCTGGCTTATGGAGGGGGATAACTACGGAAACTGTAGCTAATACCGCGTAATATCTTAGGATTAAAGGGTGGGACTTTCGGGCCACCTGCCATAAGATGAGCCCAA
GTGGGATTAGGTAGTTGGTTAGGTAAAGGCTGACCAAGCCGACGATCTCTAGCTNGTCTGAGAGGATGACCAGCCACACTGGAACTGAGACACGGTCCAGACTCCTACGGGAGGCAGCAGTGGGGAATATTGCACAATGGGGGGAACCCTGATGCAGCCATGCCGCGTGAATGAAGAAGGCCTTCGGGTTGTAAAGTTCTTTCGGTAGCGAGGAAGGTATCAAATTTAATAGATTTG
GTAATTGACGTTAACTACAGAAGAAGCACCGGCTAACTCCGTGCCAGCAGCCGCGGTAATACGGAGGGTGCGAGCGTTAATCGGAATAACTGGGCGTAAAGGGCACGCAGGCGGTTGATTAAGTGAGATGTGAAAGCCCCGGGCTTNACCTGGGAATTGCATTTCATACTGGTCAACTAGAGTACTTTAGGGAGGGGTAGAATTCCACGTGTAGCGGTGAAATGCGTAGAGATGTGG
AGGAATACCGAAGGCGAAGGCAGCCCCTTGGGAATGTACTGACGCTCATGTGCGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTCCACGCTGTAAACGCTGTCGATTTGGGGATTGGACTTTNAGTCTGGTGCCCGAAGCTAACGTGATAAATCGACCGCCTGGGGAGTACGGCCGCAAGGTTAAAACTCAAATGAATTGACGGGGGCCCGCACAAGCGGTGGAGCAT
GTGGTTTAATTCGATGCAACGCGAAGAACCTTACCTACTCTTGACATCCATGGAATCTTGTAGAGATACGAGAGTGCCTTCGGGAACCATGAGACAGGTGCTGCATGGCTGTCGTCAGCTCGTGTTGTGAAATGTTGGGTTNAGTCCCGCAACGAGCGCAACCCTTATCCTTTGTTGCCAGCGATTNGGTCGGGAACTCAAAGGAGACTGCCGGTGATNAACCGGAGGAAGGTGGGG
ATGACGTCAAGTCATCATGGCCCTTACGAGTAGGGCTACACACGTGCTACAATGGCGTATACAGAGGGAAGCAAGATGGCGACATGGAGCAAATCTCACAAAGTACGTCTAAGTCCGGATTGGAGTCTGCAACTCGACTCCATGAAGTCGGAATCGCTAGTAATCGCAAATCAGAATGTTGCGGTGAATACGTTCCCGGGCCTTGTACACACCGCCCGTCACACCATGGGAGTGGGT
TGTACCAGAAGTAGATAGCTTAACCGCAAGGGGGGCGTTTACCACGGTATGATTCATGACTGGGG

>NR_118755.1 Actinobacillus capsulatus strain NCTC 11408 16S ribosomal RNA, partial sequence

ATTGAAGAGTTTGATCATGGCTCAGATTGAACGCTGGCGGCAGGCTTAACACATGCAAGTCGAACGGTAGCAGGAAAGTACTTGTACTTTTGCTGACGAGTGGCGGACGGGTGAGTAATGCTTGGGAATCTGGCTTATGGAGGGGGATAACTACTGGAAACGGTAGCTAATACCGCGTAATATCGGAAGATTAAAGGGTGGGACCATTTGGCCACCTGCCATAAGATGAGCCCAAGT
```

Self-Assessment:

1) How do I think I went with this assignment?

I think I went very well for this assignment. Coming into this course I only had one prior experience working with C# and I am very happy with what I have achieved.

2) What did I find difficult in this assignment?

Trying to add error handling for all possible situations, as well as trying to implement reading from disk was probably the hardest part of the assignment, evidenced by the fact I could not implement it by the due date.

3) What would I do differently next time?

Next time I would focus more time on trying to get the program to read the file off disk rather than storing it in memory.

4) Were there any bugs in my assignment, if so what were they?

Was not able to implement TryParse on args variables for level 1. As a result, if user types alphabetic characters in the args[2] and args[3] variables the program will crash