

Programming Assignment 2 Submission Guidelines

(Due: 6:00 pm, Apr 9, 2021)

Programming Environment

For this programming assignment, you can only use **JAVA/C/C++** as the programming language.

Only standard libraries and file IO libraries can be called in your program. **No other external libraries** can be called for this assignment.

Source/Input/Output Files

There are two questions in this assignment, and you should code them separately. This means you should create at least two source files **Q1(.c/.cpp/.java)** and **Q2(.c/.cpp/.java)** for these two questions.

Your program will read the specified input file and generate the output file with a specific name. For Q1, the input file is named as **Q1.in**, the generated output file should be named as **Q1.out**. For Q2, the input/output file name should be **Q2.in/Q2.out**. The input/output files are supposed to be located under the same directory where your source file resides. We provide sample input/output files on Canvas, you can check them at <https://canvas.sfu.ca/courses/60630/files/folder/Assignment-Project/ProgAsgn2/>.

Q1 input/output file format:

Q1.in will include one or multiple lines with each line representing an input sequence. Each line will end with a new-line character (“\n”).

The generated Q1.out should print out the input/output sequence and the dictionary for each input sequence.

Sample Q1.in file:

ABC

ABCCA

ABCABC

Sample Q1.out file:

Input sequence: ABC

Output sequence: 012

Dictionary:

0 A

1 B

2 C

3 AB

4 BC

Input sequence: ABCCA

Output sequence: 01220

Dictionary:

0 A

1 B

2 C

3 AB

4 BC

5 CC

6 CA

Input sequence: ABCABC

Output sequence: 01232

Dictionary:

0 A

1 B

2 C

3 AB

4 BC

5 CA

6 ABC

Q2 input/output file format:

Q2.in will include one or multiple inputs. The first line of each input is only an integer N , then followed by a matrix of size $N \times N$. There is only one space between each element in the same row, there's a newline flag (" $\backslash n$ ") and no space after the last element in each row.

The generated Q2.out should directly output the 2D DCT transform matrices (rounding to integers) of all inputs in order. There should be one empty line between each output matrix.

Sample Q2.in file:

```
3
76 52 33
11 87 5
6 99 105
8
89 78 76 75 70 82 81 82
122 95 86 80 80 76 74 81
184 153 126 106 85 76 71 75
221 205 180 146 97 71 68 67
225 222 217 194 144 95 78 82
228 225 227 220 193 146 110 108
223 224 225 224 220 197 156 120
217 219 219 224 230 220 197 151
```

Sample Q2.out file:

```
158 -20 -57
-20 71 27
39 -20 39

1155 259 -23 6 11 7 3 0
-377 -50 85 -10 10 4 7 -3
```

-4 -158 -24 42 -15 1 0 1

-2 3 -34 -19 9 -5 4 -1

1 9 6 -15 -10 6 -5 -1

3 13 3 6 -9 2 0 -3

8 -2 4 -1 3 -1 0 -2

2 0 -3 2 -2 0 0 -1

Your programs should be able to read and process the input with the input format above, and generate the correct outputs with the required output format. There is no restriction about whether inserting a blank line before the file ends.

Data Preparations

For Q1, you should prepare **three** input sequences. The first sequence has <10 letters, the second sequence has 24-48 (inclusive) letters, and the last sequence has 64 letters.

For Q2, you should also prepare **three** inputs. The first input has size N within [2, 4], the second has size N within [5, 9], and the last input has size N=10.

Your prepared data should be saved in your Q1.in/Q2.in following the format requirements. You **cannot** directly use the sample data we provide.

Submission Rules:

In this assignment, you need to submit a report, your prepared Q1.in/Q2.in, your generated Q1.out/Q2.out by reading your prepared inputs, and your source code. You don't need to submit a video demo this time.

Your report should be in .pdf format, and this is what you should include in the report:

1. The description of your programming environment, including your coding language, compilation tools and OS environment.
2. A simple description about how to build and run your programs (you'd better explain with screenshots).
3. For each question, the screenshot of the successful compilation of your two programs, and the screenshot of your successful run on your prepared inputs (if you process the compilation and running execution at the same time, you just need to provide one screenshot for each question which shows you have successfully build and execute your program).

4. (Optional) The explanation of your code. This part can be used for grading when you are not giving out the correct results.

Grading Scheme (15 marks):

1. Your prepared inputs for Q1 and Q2 (0.5 marks * 2)
2. The correct output for Q1. (1 mark * 3 for the output sequence, 1 mark *3 for the dictionary)
3. The correct output for Q2. (2 marks * 3)
4. Your report contains the required content. (2 marks)

Submission Checklist:

Your submission should be packaged in a xxx.zip file where xxx is your SFU student ID number. The .zip file has the following the structure:

xxx.zip/

 {your SFU student ID}/

 code/

 Q1(.c/.cpp/.java)

 Q2(.c/.cpp/.java)

 your other source code files

 input/

 Q1.in

 Q2.in

 Output/

 Q1.out

 Q2.out

 report.pdf

The submission link on Canvas: <https://canvas.sfu.ca/courses/60630/assignments/624962>