

CYSE 250 Basic Cybersecurity Programming & Networking

Total Points: 400

Purpose: This assignment provides you with a deeper understanding and practical experience of Files.

Requirements & Submission:

1. The answers of this assignment must be submitted *electronically* on canvas.
2. Some answers require more details than just what we had discussed in lecture slides.

Question (1) (Total: 100 points)

Write a program to copy a file into another file duplicating each line.

Ex.:

input File:

Python is fun.

I like programming.

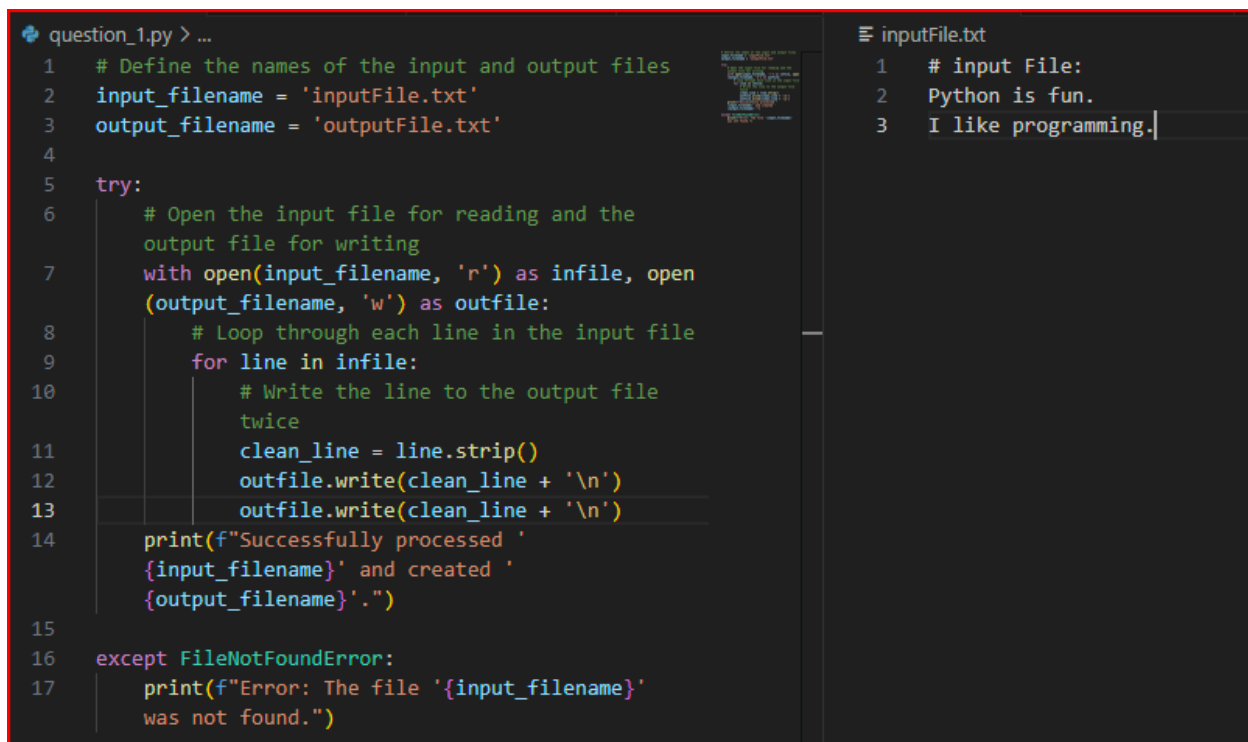
Output File:

Python is fun.

Python is fun.

I like programming.

I like programming.



```
question_1.py > ...
1 # Define the names of the input and output files
2 input_filename = 'inputFile.txt'
3 output_filename = 'outputFile.txt'
4
5 try:
6     # Open the input file for reading and the
7     # output file for writing
8     with open(input_filename, 'r') as infile, open(
9         output_filename, 'w') as outfile:
10         # Loop through each line in the input file
11         for line in infile:
12             # Write the line to the output file
13             # twice
14             clean_line = line.strip()
15             outfile.write(clean_line + '\n')
16             outfile.write(clean_line + '\n')
17         print(f"Successfully processed '
18             {input_filename}' and created '
19             {output_filename}'.")
20 except FileNotFoundError:
21     print(f"Error: The file '{input_filename}'
22         was not found.")
```

```
inputFile.txt
1 # input File:
2 Python is fun.
3 I like programming.
```

```
question_1.py > ...
1 # Define the names of the input and output files
2 input_filename = 'inputFile.txt'
3 output_filename = 'outputFile.txt'
4
5 try:
6     # Open the input file for reading and the
7     # output file for writing
8     with open(input_filename, 'r') as infile, open(
9         output_filename, 'w') as outfile:
10         # Loop through each line in the input file
11         for line in infile:
12             # Write the line to the output file
13             # twice
14             clean_line = line.strip()
15             outfile.write(clean_line + '\n')
16             outfile.write(clean_line + '\n')
17         print(f"Successfully processed '{
18             input_filename}' and created '{
19             output_filename}'.")
20
21 except FileNotFoundError:
22     print(f"Error: The file '{input_filename}'
23         was not found.")
```

```
outputFile.txt
1 # input File:
2 # input File:
3 Python is fun.
4 Python is fun.
5 I like programming.
6 I like programming.
7
```

```
/Users/Carl/Desktop/projects/CYSE_250/Files_Assignment/question_1.py
Successfully processed 'inputFile.txt' and created 'outputFile.txt'.
PS C:\Users\Carl\Desktop\projects\CYSE_250\Files_Assignment> []
```

Code for Question 1

Define the names of the input and output files

input_filename = 'inputFile.txt'

output_filename = 'outputFile.txt'

try:

Open the input file for reading and the output file for writing

with open(input_filename, 'r') as infile, open(output_filename, 'w') as outfile:

Loop through each line in the input file

for line in infile:

Write the line to the output file twice

clean_line = line.strip()

outfile.write(clean_line + '\n')

outfile.write(clean_line + '\n')

print(f"Successfully processed '{input_filename}' and created '{output_filename}'.")

except FileNotFoundError:

print(f"Error: The file '{input_filename}' was not found.")

Question (2) (Total: 100 points)

Write a program to read in a file containing numbers. Each line is composed of only one single number. You should create an output file containing the square of each number from the first file.

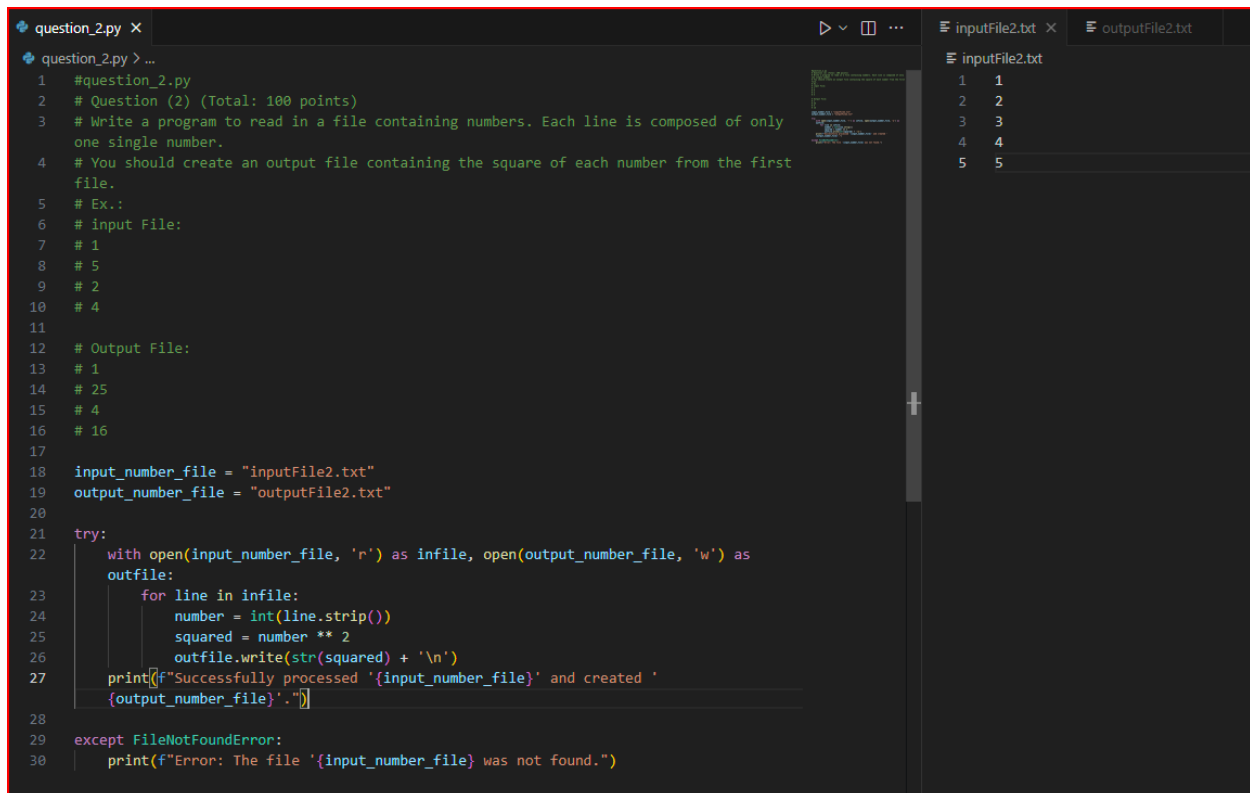
Ex.:

input File:

1
5
2
4

Output File:

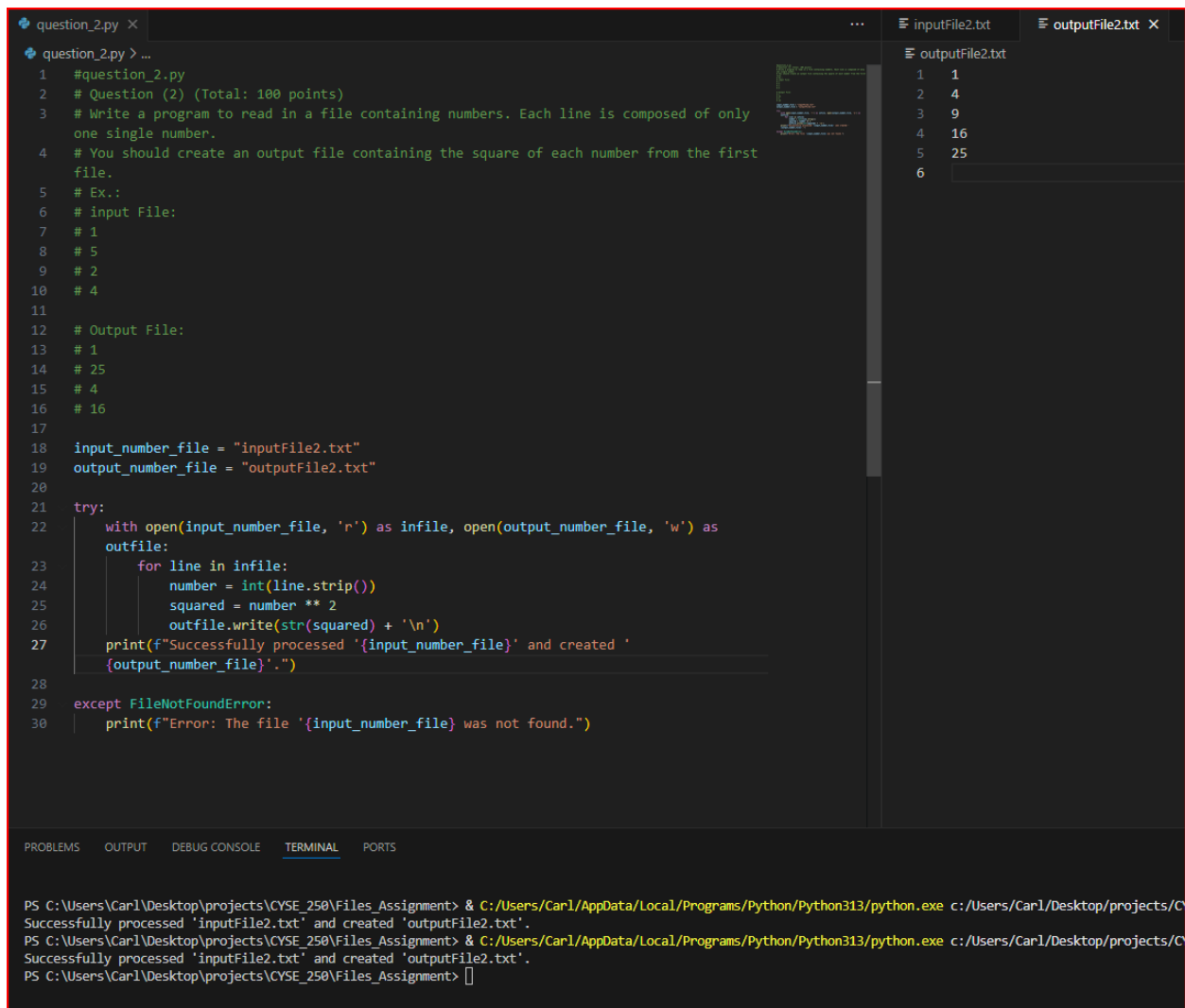
1
25
4
16



```
question_2.py X
question_2.py > ...
1 #question_2.py
2 # Question (2) (Total: 100 points)
3 # Write a program to read in a file containing numbers. Each line is composed of only
  one single number.
4 # You should create an output file containing the square of each number from the first
  file.
5 # Ex.:
6 # input File:
7 # 1
8 # 5
9 # 2
10 # 4
11
12 # Output File:
13 # 1
14 # 25
15 # 4
16 # 16
17
18 input_number_file = "inputFile2.txt"
19 output_number_file = "outputFile2.txt"
20
21 try:
22     with open(input_number_file, 'r') as infile, open(output_number_file, 'w') as
      outfile:
23         for line in infile:
24             number = int(line.strip())
25             squared = number ** 2
26             outfile.write(str(squared) + '\n')
27         print(f"Successfully processed '{input_number_file}' and created '
      {output_number_file}'")
28
29 except FileNotFoundError:
30     print(f"Error: The file '{input_number_file}' was not found.")
```

inputFile2.txt

1	1
2	2
3	3
4	4
5	5



The screenshot shows a code editor with a Python script named `question_2.py` and its output in a terminal window. The script reads numbers from `inputFile2.txt` and writes their squares to `outputFile2.txt`. The terminal output shows the successful execution of the script, processing the input file and creating the output file.

```
question_2.py <
question_2.py > ...
1 #question_2.py
2 # Question (2) (Total: 100 points)
3 # Write a program to read in a file containing numbers. Each line is composed of only
  one single number.
4 # You should create an output file containing the square of each number from the first
  file.
5 # Ex.:
6 # input File:
7 # 1
8 # 5
9 # 2
10 # 4
11
12 # Output File:
13 # 1
14 # 25
15 # 4
16 # 16
17
18 input_number_file = "inputFile2.txt"
19 output_number_file = "outputFile2.txt"
20
21 try:
22     with open(input_number_file, 'r') as infile, open(output_number_file, 'w') as
  outfile:
23         for line in infile:
24             number = int(line.strip())
25             squared = number ** 2
26             outfile.write(str(squared) + '\n')
27     print(f"Successfully processed '{input_number_file}' and created '
  {output_number_file}'.")
28
29 except FileNotFoundError:
30     print(f"Error: The file '{input_number_file}' was not found.")

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\Carl\Desktop\projects\CYSE_250\Files_Assignment> & C:/Users/Carl/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Carl/Desktop/projects/C
Successfully processed 'inputFile2.txt' and created 'outputFile2.txt'.
PS C:\Users\Carl\Desktop\projects\CYSE_250\Files_Assignment> & C:/Users/Carl/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Carl/Desktop/projects/C
Successfully processed 'inputFile2.txt' and created 'outputFile2.txt'.
PS C:\Users\Carl\Desktop\projects\CYSE_250\Files_Assignment> 
```

Code for Question 2

```
input_number_file = "inputFile2.txt"
```

```
output_number_file = "outputFile2.txt"
```

```
try:
```

```
    with open(input_number_file, 'r') as infile, open(output_number_file, 'w') as outfile:
```

```
        for line in infile:
```

```
            number = int(line.strip())
```

```
            squared = number ** 2
```

```
            outfile.write(str(squared) + '\n')
```

```
    print(f'Successfully processed '{input_number_file}' and created '{output_number_file}'.')
```

```
except FileNotFoundError:
```

```
    print(f'Error: The file '{input_number_file}' was not found.')
```

Question (3) (Total: 100 points)

Write a program to read in two files. The first file contains the first name of a set of students. The second file contains the last name of a set of students. Create a third file containing the full names of the students.

Input Files: First Names and Last Names

First Names:

Jade
Chandler
Andy
Maggie

Last Names:

Moore
Anderson
Boateng
Bowles

Output File: Full Names

Full Names:

Jade Moore
Chandler Anderson
Andy Boateng
Maggie Bowles

```
question_2.py  question_3.py  ...  last_names.txt
question_3.py > ...
23 first_names = "first_names.txt"
24 last_names = "last_names.txt"
25 full_names = "full_names.txt"
26
27 try:
28     with open(first_names, 'r') as firstFile, \
29         open(last_names, 'r') as secondFile, \
30         open(full_names, 'w') as outfile:
31
32         for first_name, last_name in zip(firstFile, secondFile):
33             first_name = first_name.strip()
34             last_name = last_name.strip()
35
36             if first_name and last_name:
37                 full_name = first_name + ' ' + last_name
38                 outfile.write(full_name + '\n')
39
40     print(f"Successfully created '{full_names}' with the combined names.")
41
42
43 except FileNotFoundError:
44     print(f"Error: Either '{first_names}' and/or '{last_names}' were not found.")

first_names.txt
first_names.txt
1 Jade
2 Chandler
3 Andy
4 Maggie
5 Hulk
6 Ric
7 Steve
8 John
9 Ray
10 Paul
11 Shawn
12 Triple
```

```
question_2.py  question_3.py  ...  last_names.txt  full_names.txt
question_3.py > ...
23 first_names = "first_names.txt"
24 last_names = "last_names.txt"
25 full_names = "full_names.txt"
26
27 try:
28     with open(first_names, 'r') as firstFile, \
29         open(last_names, 'r') as secondFile, \
30         open(full_names, 'w') as outfile:
31
32         for first_name, last_name in zip(firstFile, secondFile):
33             first_name = first_name.strip()
34             last_name = last_name.strip()
35
36             if first_name and last_name:
37                 full_name = first_name + ' ' + last_name
38                 outfile.write(full_name + '\n')
39
40     print(f"Successfully created '{full_names}' with the combined names.")
41
42
43 except FileNotFoundError:
44     print(f"Error: Either '{first_names}' and/or '{last_names}' were not found.")

full_names.txt
1 Jade Moore
2 Chandler Anderson
3 Andy Boateng
4 Maggie Bowles
5 Hulk Hogan
6 Ric Flair
7 Steve Cold
8 John Cena
9 Ray Mysterio
10 Paul Heyman
11 Shawn Michaels
12 Triple H
13
```

Code for Question 3

```
first_names = "first_names.txt"
last_names = "last_names.txt"
full_names = "full_names.txt"

try:
    with open(first_names, 'r') as firstFile, \
        open(last_names, 'r') as secondFile, \
        open(full_names, 'w') as outfile:

        for first_name, last_name in zip(firstFile, secondFile):
            first_name = first_name.strip()
            last_name = last_name.strip()

            if first_name and last_name:
                full_name = first_name + ' ' + last_name
                outfile.write(full_name + '\n')

    print(f"Successfully created '{full_names}' with the combined names.")

except FileNotFoundError:
    print(f"Error: Either '{first_names}' and/or '{last_names}' were not found.")
```

Question (4) (Total: 100 points)

Write a program to read in the grades of three Cybersecurity courses (CYSE 250 CYSE 270 CYSE 200T) of a set of students. Grades are separated by a space. Each line represents a student. Calculate the mean grade of every student and write it into an output file.

Input File:

```
60 70 80
70 80 90
40 50 60
```

Output File:

```
70
80
50
```

```

1 #question_4.py
2 # Write a program to read in the grades of three Cybersecurity courses (CYSE 250 CYSE 270 CYSE 200T)
3 # of a set of students. Grades are separated by a space. Each line represents a student. Calculate the mean
4 # Input File:
5 # 60 70 80
6 # 70 80 90
7 # 40 50 60
8
9 # Output File:
10 # 70
11 # 80
12 # 50
13
14 class_grades = 'class_grades.txt'
15 mean_grades = 'meanGrades.txt'
16
17 try:
18     with open(class_grades, 'r') as infile, \
19         open(mean_grades, 'w') as outfile:
20
21         for line in infile:
22             line = line.strip()
23
24             if line:
25                 grades = list(map(int, line.split()))
26                 mean_grade = sum(grades) / len(grades)
27                 outfile.write(str(int(mean_grade)) + '\n')
28
29         print(f"Successfully created '{mean_grades}', calculating each students' total .")
30
31 except FileNotFoundError:
32     print(f"Error: The file '{class_grades}' was not found.")
33 except ValueError:
34     print(f"Error: Ensure all data in '{class_grades}' are numbers.")
35

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```

PS C:\Users\Carl\Desktop\projects\CYSE_250\Files_Assignment> & C:/Users/Carl/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Carl/Desktop/projects/CYSE_250/Files_Assignment/question_4.py
Error: Ensure all data in 'class_grades.txt' are numbers.
PS C:\Users\Carl\Desktop\projects\CYSE_250\Files_Assignment> & C:/Users/Carl/AppData/Local/Programs/Python/Python313/python.exe c:/Users/Carl/Desktop/projects/CYSE_250/Files_Assignment/question_4.py
Successfully created 'meanGrades.txt', calculating each students' total .
PS C:\Users\Carl\Desktop\projects\CYSE_250\Files_Assignment>

```

Code for Question 4

```
class_grades = 'class_grades.txt'
mean_grades = 'meanGrades.txt'
```

try:

```
with open(class_grades, 'r') as infile, \
    open(mean_grades, 'w') as outfile:
```

```
    for line in infile:
```

```
        line = line.strip()
```

```
        if line:
```

```
            grades = list(map(int, line.split()))
```

```
            mean_grade = sum(grades) / len(grades)
```

```
            outfile.write(str(int(mean_grade)) + '\n')
```

```
print(f'Successfully created '{mean_grades}', calculating each students' total .')
```

except FileNotFoundError:

```
    print(f'Error: The file '{class_grades}' was not found.')
```

except ValueError:

```
    print(f'Error: Ensure all data in '{class_grades}' are numbers.')
```

Alternative Format:

All code presented within ONE Python file

(with included data sets)

```
1  # CYSE 250 Files Assignment - Complete Solutions
2  # This script creates all input files and runs all questions
3
4  # ===== CREATE INPUT FILES =====
5
6  def create_input_files():
7      """Create all necessary input files for the assignment"""
8
9      # Question 1: Input file with text lines
10     with open('inputFile_q1.txt', 'w') as f:
11         f.write("Python is fun.\n")
12         f.write("I like programming.\n")
13
14     # Question 2: Input file with numbers
15     with open('inputFile_q2.txt', 'w') as f:
16         f.write("1\n")
17         f.write("5\n")
18         f.write("2\n")
19         f.write("4\n")
20
21     # Question 3: First names file
22     with open('firstNames.txt', 'w') as f:
23         f.write("Jade\n")
24         f.write("Chandler\n")
25         f.write("Andy\n")
26         f.write("Maggie\n")
27
28     # Question 3: Last names file
29     with open('lastNames.txt', 'w') as f:
30         f.write("Moore\n")
31         f.write("Anderson\n")
32         f.write("Boateng\n")
33         f.write("Bowles\n")
34
35     # Question 4: Grades file
36     with open('class_grades.txt', 'w') as f:
37         f.write("60 70 80\n")
38         f.write("70 80 90\n")
39         f.write("40 50 60\n")
40
41     print("All input files created successfully!\n")
42
43
```

```
43
44 # ===== QUESTION 1 =====
45
46 def question_1():
47     """Duplicate each line in a file"""
48     input_filename = 'inputFile_q1.txt'
49     output_filename = 'outputFile_q1.txt'
50
51     try:
52         with open(input_filename, 'r') as infile, open(output_filename, 'w') as outfile:
53             for line in infile:
54                 clean_line = line.strip()
55                 outfile.write(clean_line + '\n')
56                 outfile.write(clean_line + '\n')
57
58         print(f"Question 1: Successfully created '{output_filename}'")
59
60         # Display output
61         with open(output_filename, 'r') as f:
62             print("Output:")
63             print(f.read())
64
65     except FileNotFoundError:
66         print(f"Error: The file '{input_filename}' was not found.")
67
68
69 # ===== QUESTION 2 =====
70
71 def question_2():
72     """Square each number in a file"""
73     input_filename = 'inputFile_q2.txt'
74     output_filename = 'outputFile_q2.txt'
75
76     try:
77         with open(input_filename, 'r') as infile, open(output_filename, 'w') as outfile:
78             for line in infile:
79                 number = int(line.strip())
80                 squared = number ** 2
81                 outfile.write(str(squared) + '\n')
82
83         print(f"Question 2: Successfully created '{output_filename}'")
84
85         # Display output
86         with open(output_filename, 'r') as f:
87             print("Output:")
88             print(f.read())
89
90     except FileNotFoundError:
91         print(f"Error: The file '{input_filename}' was not found.")
92     except ValueError:
93         print("Error: File contains non-numeric values.")
94
```

```
96 # ===== QUESTION 3 =====
97
98 def question_3():
99     """Combine first and last names from two files"""
100     first_names_file = 'firstNames.txt'
101     last_names_file = 'lastNames.txt'
102     output_filename = 'fullNames.txt'
103
104     try:
105         with open(first_names_file, 'r') as first_file, \
106             open(last_names_file, 'r') as last_file, \
107             open(output_filename, 'w') as outfile:
108
109             for first_name, last_name in zip(first_file, last_file):
110                 first_name = first_name.strip()
111                 last_name = last_name.strip()
112
113                 if first_name and last_name:
114                     full_name = first_name + ' ' + last_name
115                     outfile.write(full_name + '\n')
116
117             print(f"Question 3: Successfully created '{output_filename}'")
118
119             # Display output
120             with open(output_filename, 'r') as f:
121                 print("Output:")
122                 print(f.read())
123
124     except FileNotFoundError:
125         print(f"Error: One or both input files were not found.")
126     except Exception as e:
127         print(f"Error: {e}")
128
```

```
130 # ===== QUESTION 4 =====
131
132 def question_4():
133     """Calculate mean grade for each student"""
134     input_filename = 'class_grades.txt'
135     output_filename = 'meanGrades.txt'
136
137     try:
138         with open(input_filename, 'r') as infile, \
139             open(output_filename, 'w') as outfile:
140             for line in infile:
141                 line = line.strip()
142                 if line: # Skip empty lines
143                     grades = list(map(int, line.split()))
144                     mean_grade = sum(grades) / len(grades)
145                     outfile.write(str(int(mean_grade)) + '\n')
146
147         print(f"Question 4: Successfully created '{output_filename}'")
148
149         # Display output
150         with open(output_filename, 'r') as f:
151             print("Output:")
152             print(f.read())
153
154     except FileNotFoundError:
155         print(f"Error: The file '{input_filename}' was not found.")
156     except ValueError:
157         print("Error: File contains non-numeric values.")
158     except Exception as e:
159         print(f"Error: {e}")
160
161
162 # ===== MAIN EXECUTION =====
163
164 if __name__ == "__main__":
165     print("=" * 50)
166     print("CYSE 250 Files Assignment")
167     print("=" * 50)
168     print()
169
170     # Create all input files first
171     create_input_files()
172
173     # Run all questions
174     print("-" * 50)
175     question_1()
176     print("-" * 50)
177     question_2()
178     print("-" * 50)
179     question_3()
180     print("-" * 50)
181     question_4()
182     print("-" * 50)
183
184     print("\nAll questions completed!")
```

```
=====
CYSE 250 Files Assignment
=====
```

```
All input files created successfully!
```

```
-----
Question 1: Successfully created 'outputFile_q1.txt'
```

```
Output:
```

```
Python is fun.
```

```
Python is fun.
```

```
I like programming.
```

```
I like programming.
```

```
-----
Question 2: Successfully created 'outputFile_q2.txt'
```

```
Output:
```

```
1
```

```
25
```

```
4
```

```
16
```

```
-----
Question 3: Successfully created 'fullNames.txt'
```

```
Output:
```

```
Jade Moore
```

```
Chandler Anderson
```

```
Andy Boateng
```

```
Maggie Bowles
```

```
-----
Question 4: Successfully created 'meanGrades.txt'
```

```
Output:
```

```
70
```

```
80
```

```
50
```

```
-----
All questions completed!
```

Code for the entire Assignment (below)

CYSE 250 Files Assignment - Complete Solutions

This script creates all input files and runs all questions

===== CREATE INPUT FILES =====

def create_input_files():

"""Create all necessary input files for the assignment"""

Question 1: Input file with text lines

with open('inputFile_q1.txt', 'w') as f:

f.write("Python is fun.\n")

f.write("I like programming.\n")

Question 2: Input file with numbers

with open('inputFile_q2.txt', 'w') as f:

f.write("1\n")

f.write("5\n")

f.write("2\n")

f.write("4\n")

Question 3: First names file

with open('firstNames.txt', 'w') as f:

f.write("Jade\n")

f.write("Chandler\n")

f.write("Andy\n")

f.write("Maggie\n")

Question 3: Last names file**with open('lastNames.txt', 'w') as f:****f.write("Moore\n")****f.write("Anderson\n")****f.write("Boateng\n")****f.write("Bowles\n")****# Question 4: Grades file****with open('class_grades.txt', 'w') as f:****f.write("60 70 80\n")****f.write("70 80 90\n")****f.write("40 50 60\n")****print("All input files created successfully!\n")****# ===== QUESTION 1 =====****def question_1():****"""Duplicate each line in a file"""****input_filename = 'inputFile_q1.txt'****output_filename = 'outputFile_q1.txt'****try:****with open(input_filename, 'r') as infile, open(output_filename, 'w') as outfile:****for line in infile:****clean_line = line.strip()****outfile.write(clean_line + '\n')****outfile.write(clean_line + '\n')**

```
print(f"Question 1: Successfully created '{output_filename}")

# Display output
with open(output_filename, 'r') as f:
    print("Output:")
    print(f.read())

except FileNotFoundError:
    print(f"Error: The file '{input_filename}' was not found.")

# ===== QUESTION 2 =====

def question_2():
    """Square each number in a file"""
    input_filename = 'inputFile_q2.txt'
    output_filename = 'outputFile_q2.txt'

    try:
        with open(input_filename, 'r') as infile, open(output_filename, 'w') as outfile:
            for line in infile:
                number = int(line.strip())
                squared = number ** 2
                outfile.write(str(squared) + '\n')

    print(f"Question 2: Successfully created '{output_filename}")

# Display output
with open(output_filename, 'r') as f:
    print("Output:")
```

```
print(f.read())

except FileNotFoundError:
    print(f"Error: The file '{input_filename}' was not found.")
except ValueError:
    print("Error: File contains non-numeric values.")

# ===== QUESTION 3 =====

def question_3():
    """Combine first and last names from two files"""
    first_names_file = 'firstNames.txt'
    last_names_file = 'lastNames.txt'
    output_filename = 'fullNames.txt'

    try:
        with open(first_names_file, 'r') as first_file, \
            open(last_names_file, 'r') as last_file, \
            open(output_filename, 'w') as outfile:

            for first_name, last_name in zip(first_file, last_file):
                first_name = first_name.strip()
                last_name = last_name.strip()

                if first_name and last_name:
                    full_name = first_name + ' ' + last_name
                    outfile.write(full_name + '\n')

    print(f"Question 3: Successfully created '{output_filename}'")
```

```
# Display output

with open(output_filename, 'r') as f:
    print("Output:")
    print(f.read())

except FileNotFoundError:
    print(f"Error: One or both input files were not found.")
except Exception as e:
    print(f"Error: {e}")

# ===== QUESTION 4 =====

def question_4():
    """Calculate mean grade for each student"""
    input_filename = 'class_grades.txt'
    output_filename = 'meanGrades.txt'

    try:
        with open(input_filename, 'r') as infile, \
            open(output_filename, 'w') as outfile:
            for line in infile:
                line = line.strip()
                if line: # Skip empty lines
                    grades = list(map(int, line.split()))
                    mean_grade = sum(grades) / len(grades)
                    outfile.write(str(int(mean_grade)) + '\n')

    print(f"Question 4: Successfully created '{output_filename}'")
```

```
# Display output

with open(output_filename, 'r') as f:
    print("Output:")
    print(f.read())

except FileNotFoundError:
    print(f"Error: The file '{input_filename}' was not found.")
except ValueError:
    print("Error: File contains non-numeric values.")
except Exception as e:
    print(f"Error: {e}")

# ===== MAIN EXECUTION =====

if __name__ == "__main__":
    print("=" * 50)
    print("CYSE 250 Files Assignment")
    print("=" * 50)
    print()

    # Create all input files first
    create_input_files()

    # Run all questions
    print("-" * 50)
    question_1()
    print("-" * 50)
    question_2()
```

```
print("-" * 50)
```

```
question_3()
```

```
print("-" * 50)
```

```
question_4()
```

```
print("-" * 50)
```

```
print("\nAll questions completed!")
```