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

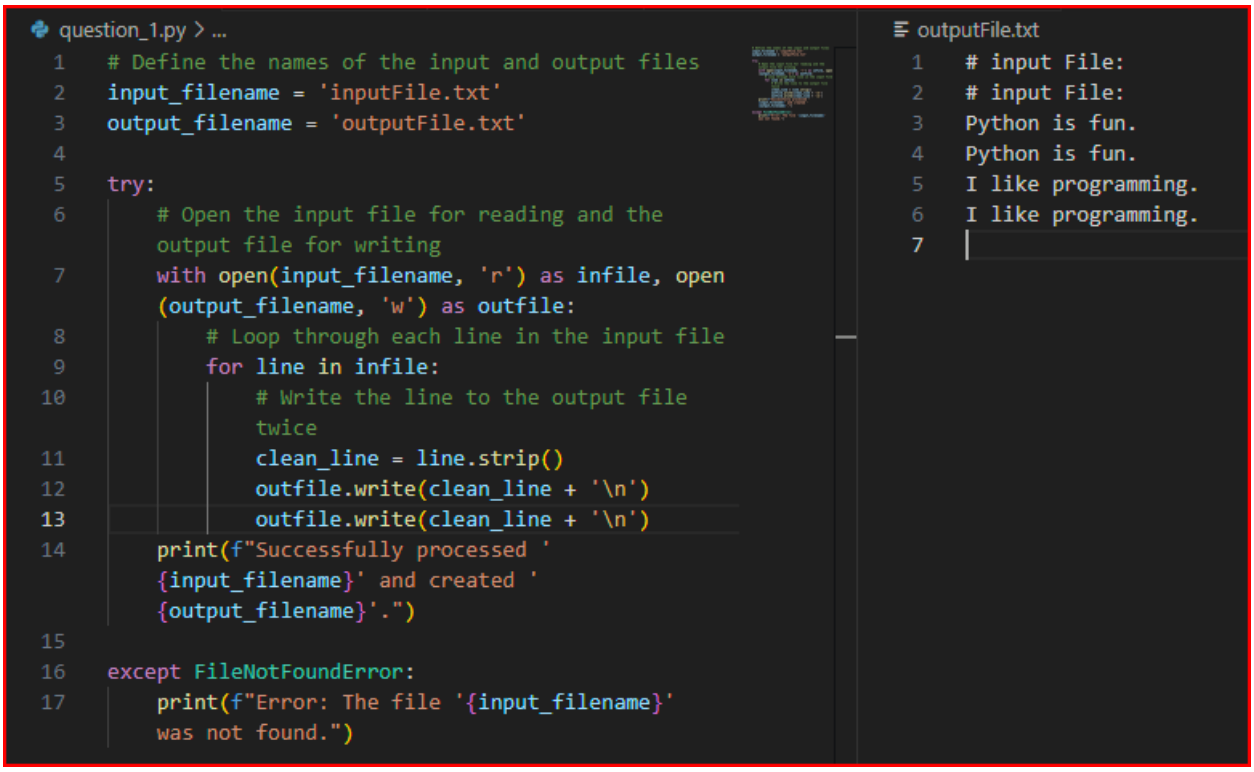
```python
# Define the names of the input and output files
input_filename = 'inputFile.txt'
output_filename = 'outputFile.txt'

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.")
```

inputFile.txt

```
# input File:
Python is fun.
I like programming.
```



question_1.py > ...

```python
# 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.")
```

outputFile.txt

```
# input File:
# input File:
Python is fun.
Python is fun.
I like programming.
I like programming.
```

```
/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.

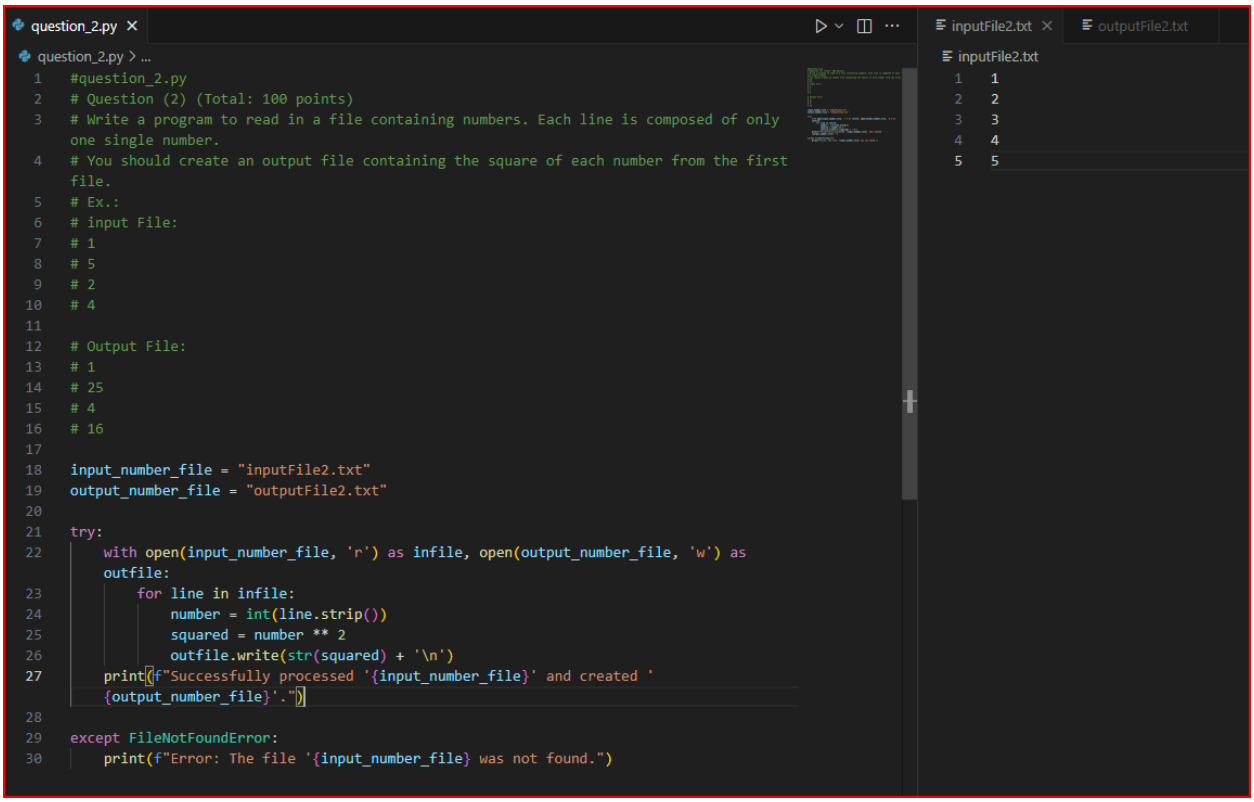
Ex.:

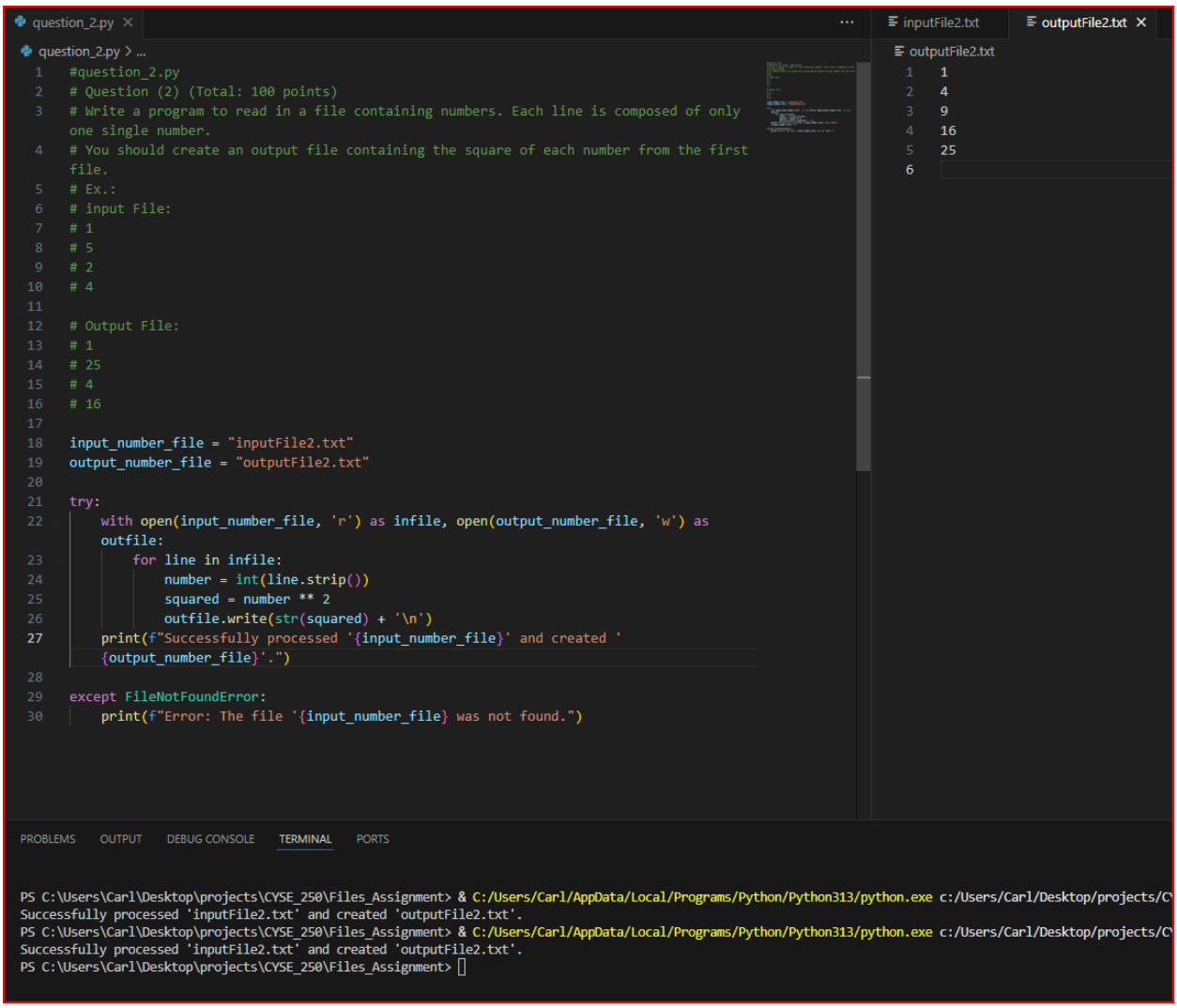
**input File:**

1
5
2
4

**Output File:**

1
25
4
16






## 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

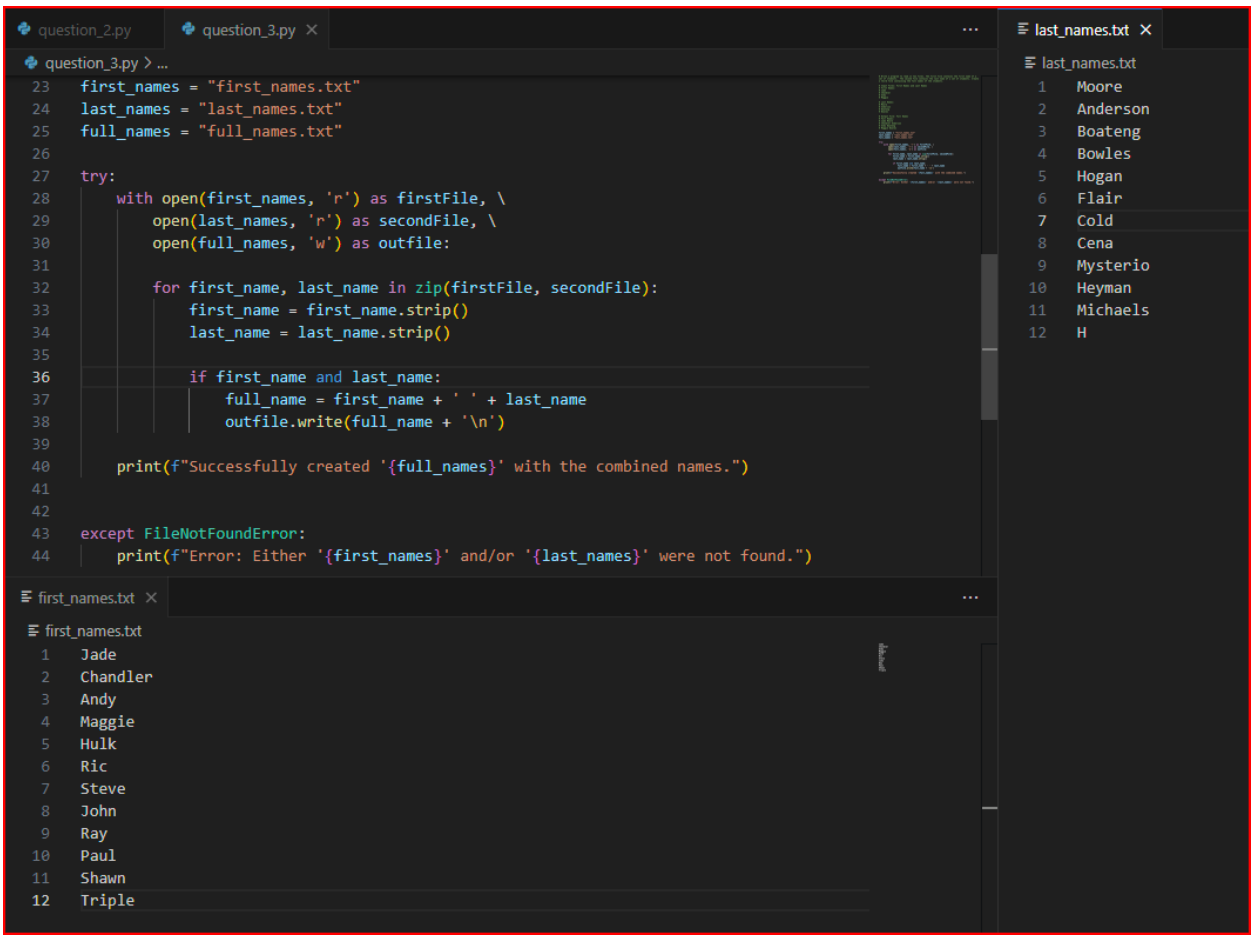
**Last Names:**

Moore
Anderson
Boateng
Bowles

Output File: Full Names

**Full Names:**

Jade Moore
Chandler Anderson
Andy Boateng
Maggie Bowles



```python
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.")
```

first_names.txt

```
Jade
Chandler
Andy
Maggie
Hulk
Ric
Steve
John
Ray
Paul
Shawn
Triple
```

last_names.txt

```
Moore
Anderson
Boateng
Bowles
Hogan
Flair
Cold
Cena
Mysterio
Heyman
Michaels
H
```

```python
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.")
```

full_names.txt

```
Jade Moore
Chandler Anderson
Andy Boateng
Maggie Bowles
Hulk Hogan
Ric Flair
Steve Cold
John Cena
Ray Mysterio
Paul Heyman
Shawn Michaels
Triple H
```

## 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)

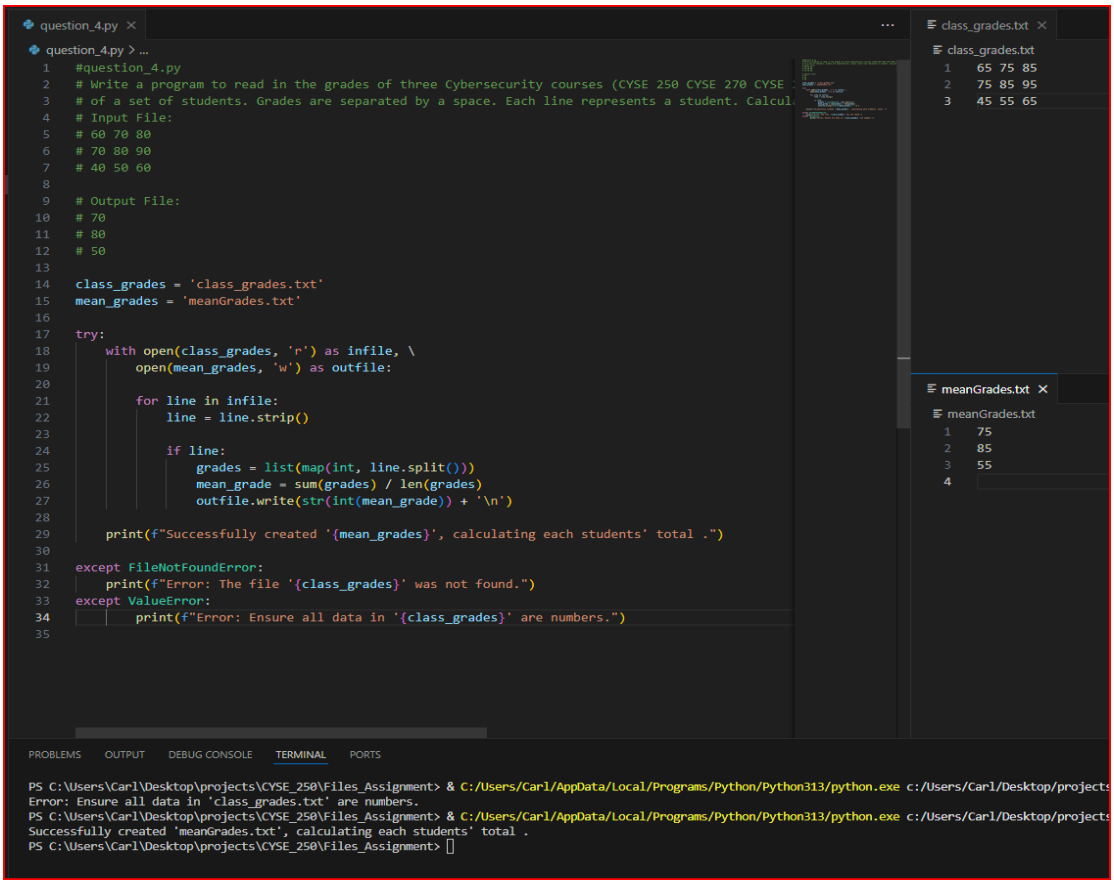
Write a program to read in the grades of three Cybersecurity courses (CYSE 250 CYSE 270 CYSE 200T) of a set of students. Grades are separated by a space. Each line represents a student. Calculate the mean grade of every student and write it into an output file.

**Input File**:

60 70 80
70 80 90
40 50 60

**Output File**:

70
80
50




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)

```python
# 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")


```

```python

# ===== 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.")

```

```python
# ===== 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}")

```

```python
# ===== 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!")
```

```
================================================
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!")
```