CS780

Write a program to input pairs of polynomials and output:

1. Output them in canonical form.

Then compute and output:

2. Their sum (add them)
3. Their difference (subtract them)
4. Their product (multiply them).

Question: What do we mean by “canonical form”?
Answer: This is a representation where
(a) The polynomial is written from the highest powers to the lowest, and
(b) All terms with the same power are “consolidated.” If the consolidation leads to a zero coefficient, do not display that term.

Example: If the input were

-1+5x+20x^3-9x^2-2x+x^2-2x^3+x^9,

You would change it to:

x^9+18x^3-8x^2+3x-1

The input:
Read the input from a file called input.txt in the same directory as your program.

Each line (terminated by a newline character) in the file will represent a polynomial. The line will contain a list of integers, which when taken in pairs, will represents the coefficient and exponent of each of the terms in the polynomial.

Processing and output:
You will process each pair of lines, representing two polynomials and will:

1. Output them first as they appear in the file and then in canonical form.

Then compute and output, all in canonical form:

2. Their sum (add them)
3. Their difference (subtract them)
4. Their product (multiply them).

Output them to a file in your program’s directory called output.txt