The code for all three problems is in a single python file. The functions for each problem can be separated as:

i) **Problem 1:** a) DOP(polyList),
b) PolyDivide(polys, divisor),
c) Divide().
Divide() is the main function for this problem.

ii) **Problem 2:** a) PolyMultiply(rootsList),
b) Multiply().
Multiply() is the main function for this problem.

iii) **Problem 3:** a) ScalarMultiply(xList, exIndex),
b) LagrangeInterpolation().
LagrangeInterpolation() is the main function for this problem.

In addition, there is a Main() function that uses all the function. It is the main function that can perform three operations: divide, multiply and interpolate. Main() function is called by default which provides options for the user to choose between these three operations.

To run this program, the user should just compile the PA1_UtsavShrestha.py file and follow the on-screen options. Sample of them are attached here as screenshot.

When the program prompts for the user to select an option, to perform divide operation (**Problem 1**), the user must input **1.** Its screenshot is:

```
Please input the SN(1/2/3) from the list below to perform operation:
 1. Divide
 2. Multiply
 3. Interpolation
 Your Choice: 1

Please input Polynomial in the format- exponent followed by coefficient
in descencding order of the exponent: 4 1.6 3 5 1 9.7 0 20

Please input a number for the divisor: 4
Quotient is 1.6x^3+11.4x^2+45.6x+192.1
Remainder is 788.4
```

Similarly, to perform multiply operation (**Problem 2**), the user must input **2.** Its screenshot is:

```
Please input the SN(1/2/3) from the list below to perform operation:
 1. Divide
 2. Multiply
 3. Interpolation
 Your Choice: 2

Enter the roots of a polynomial separated by space: 4 7 9 10 12 2
1x^6-44.0x^5+771.0x^4-6820.0x^3+31676.0x^2-71808.0x+60480.0
```

Finally, to perform interpolation (**Problem 3**), the user must input **3.** Its screenshot is:

```
Please input the SN(1/2/3) from the list below to perform operation:
 1. Divide
 2. Multiply
 3. Interpolation
 Your Choice: 3

Enter X value followed by Y value seperated by space: 4 12 8 10 9 6
-0.7x^2+7.9x-8.399999999999999
```