This project used Excel VBA Code to analyze the data using Raw Data Source which was stored in Excel format.

Includes:

1. Data Import & Extraction via referring to and switching between multiple workbooks.

2. Data Truncation and Preprocessing (cleaning) with error handler design for missing data.

3. Data (statistical) analysis with: User-defined functions for calculation purpose, Array/table for storing variables/data.

4. Data Visualization: Charts/Tables creation in required format, with the creation of templates for charts formatting, which can be used in the future projects.

5. GUI design: Designed a user-friendly graphical-user-interface (macro buttons) for executing the program.

The following graphs are for demonstration purpose:

- Original Data (partial)

Run Number: 1					
Comment: Normal opeartaion					
Mixture: Methanol-Water					
Reference water density at 25 °C:	998.07	kg/m^3			
Steam			**Cooling Water**		
Percentage Reading	40.00	%	*Percentage Reading*	39.70	%
Steam temperature	109.95	°C	*Inlet temperature*	1.61	°C
Steam condensate temperature	96.32	°C	*Outlet temperature*	19.70	°C
Flow Rate	14.62	*kg/h*	*Flow Rate*	251.52	*kg/h*
Feed			**Overhead**		
Percentage Reading	60.00	%	*Percentage Reading*	34.14	%
% GC Area of MeOH	50.57	%	*% GC Area of MeOH*	98.8	%
Mixture Temperature	32.60	°C	*Mixture Temperature*	54.40	°C
Mass Concentration (MeOH fraction	0.5039		*Mass Concentration (MeOH fractio*	0.9800	
Mixture Density at the Temp.	889.4	kg/m^3	*Mixture Density at the Temp.*	759.8	kg/m^3
Water Flow Rate	21.23	*kg/h*	*Water Flow Rate*	11.95	*kg/h*
Mixture Flow Rate	20.04	*kg/h*	*Mixture Flow Rate*	10.43	*kg/h*
Bottoms			**Reflux**		
Percentage Reading	0.00	%	*Percentage Reading*	50.00	%
% GC Area of MeOH	10	%	*% GC Area of MeOH*	98.8	%
Mixture Temperature	0.00	°C	*Mixture Temperature*	53.50	°C
Mass Concentration (MeOH fraction	0.1034		*Mass Concentration (MeOH fractio*	0.9800	
Mixture Density at the Temp.	799.01	kg/m^3	*Mixture Density at the Temp.*	760.71	kg/m^3
Water Flow Rate		*kg/h*	*Water Flow Rate*	17.24	*kg/h*
Mixture Flow Rate	6.38	*kg/h*	*Mixture Flow Rate*	15.05	*kg/h*
			Reflux Ratio	1.44	
			% Overall Mass Balance	*16.15*	

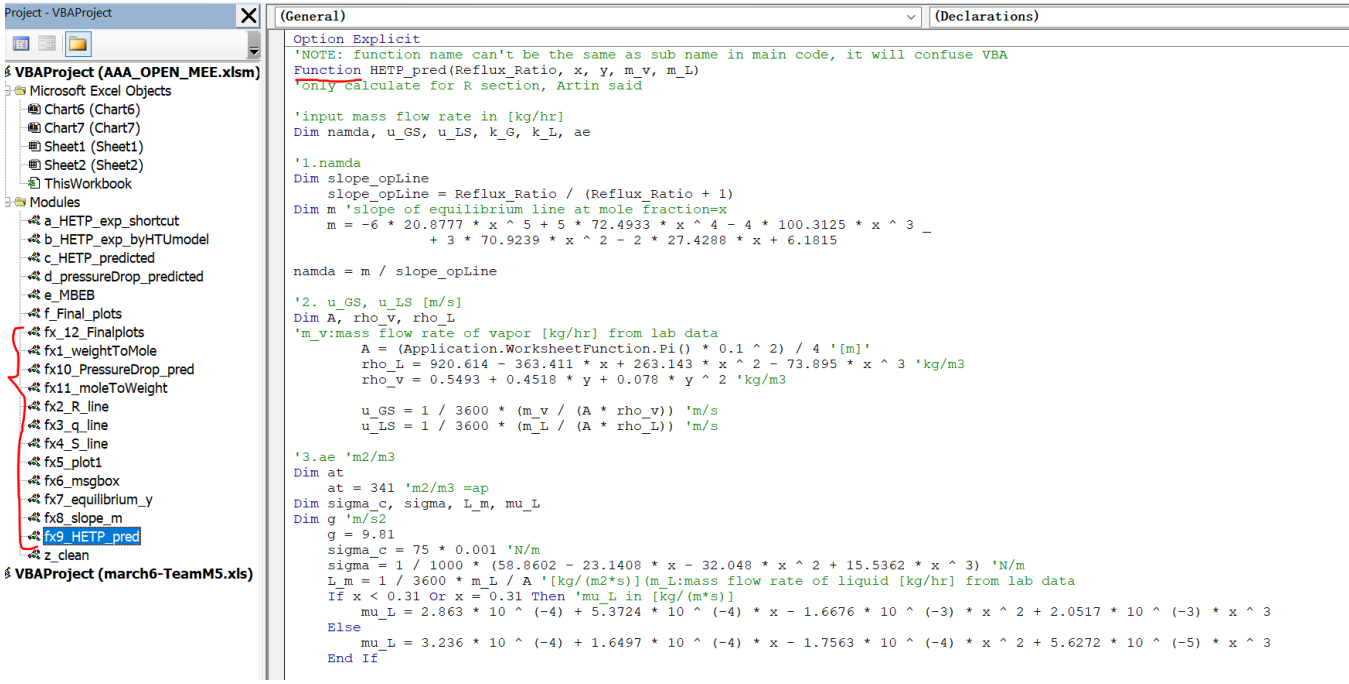
- Data Import & Extraction via referring to and switching between multiple workbooks.

```
'1. refer to workbook and sheets by name
    wblist(1) = "march6-TeamM5.xls"
    wblist(2) = "march7-TeamT5.xls"
    wblist(3) = "march8-TeamW7.xls"
    shlist(1) = "run 1"
    shlist(2) = "run 2"
```

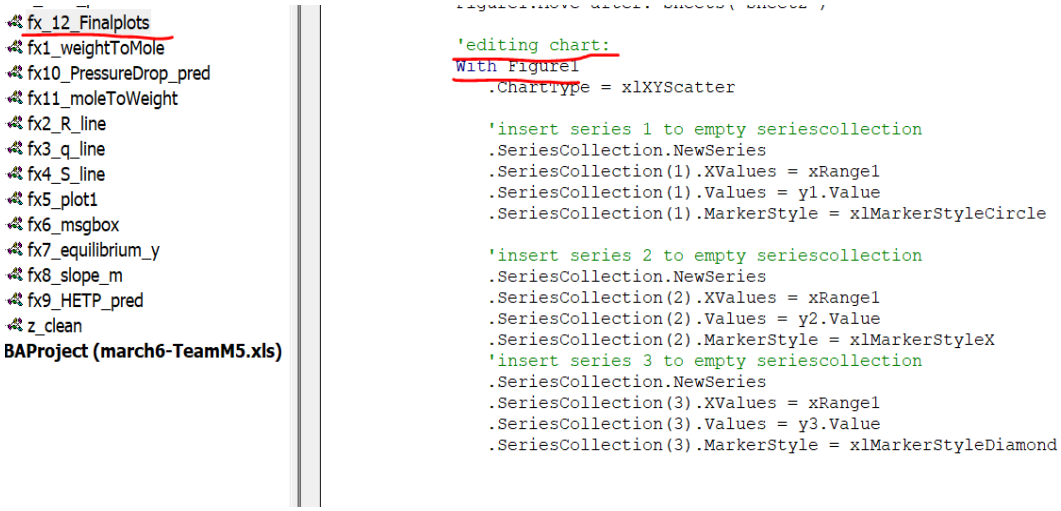
- Error Handler Design:

```
        '3.1 calculate x at each sample point
        Range("E43").Select
        Range("E43") = "molefraction_x"
        Dim msg2
            msg2 = messagebox2(wB, sh)

        '3.1.1 cal molefraction_x by call function fx1
        ReDim molefraction_x(1 To 9, 1 To 1)
        Dim i
        For i = 1 To 9 'row
            On Error GoTo Assign0toMolefraction
            'if no error anymore, then run following code
            molefraction_x(i, 1) = molepercent(weightpercent_w(i, 1))
            On Error GoTo 0
        Next i

'********************
'ERROR HANDLING SECTION
'********************
Assign0toMolefraction: 'the userdefined name of error handler
    molefraction_x(i, 1) = molefraction_x(i - 1, 1)
    Resume Next
```

- Data (statistical) analysis with: User-defined functions for calculation purpose, Array/table for storing variables/data.



- Data Visualization: Charts/Tables creation in required format, with the creation of **templates for charts formatting**, which can be used in the future projects.



- GUI design: Designed a user-friendly graphical-user-interface (macro buttons) for executing the program.