Item 5

It is possible to obtain 5 points in this assignment, three for the first problem and two for the second. You must document how you obtained the result.

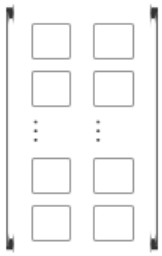
Consider the following data:

x = [0.2, 0.3, 1.1, 1.3, 2.2, 2.4, 2.5]

y = [1.6, -1.2, -0.3, 2.1, 2.3, -0.2, -1.3]

It is assumed that the data can be approximated by a model of the form $y_1(t) = \beta_0 + \beta_2 t^3$ or of the form $y_2(t) = \beta_1 t^2 + \beta_2 t^3$ or of the form $y_3 = \beta_0 + \beta_1 t$. Note: in all parts, you are expected to use the exact values in your calculations and not the rounded off values that you input.

a. State the first two rows and the last two rows for the Design Matrix of y_2. State your inputs as decimal values, correctly rounded to two-decimal precision (e.g. 3.45).



FIRST you look at y1,y2,y3

It is assumed that the data can be approximated by a model of the form $y_1(t) = \beta_0 + \beta_2 t^3$ or of the form

$y_2(t) = \beta_1 t^2 + \beta_2 t^3$ or of the form $y_3 = \beta_0 + \beta_1 t$. Note: in all parts, you are expected to use the exact values in

And you do X1,x2,x3 in code

```
X1 = Matrix([ones(len(x), 1)]).row_join(Matrix(x**3))
X2 = Matrix((Matrix(x**2)).row_join(Matrix(x**3)))
X3 = Matrix([ones(len(x), 1)]).row_join(Matrix(x))
```

Where Beta0 is ones(len(x),1)and after will be a matrix of x power to what is on t powered.

Another example:

$y_1(t) = \beta_0 + \beta_2 t^3$ or of the form $y_2(t) = \beta_0 + \beta_1 t + \beta_2 t^3$ or of the form $y_3 = \beta_0 + \beta_1 t$.

```
X1 = Matrix([ones(len(x), 1)]).row_join(Matrix(x**3))
X2 = Matrix([ones(len(x), 1)]).row_join(Matrix(x)).row_join(Matrix(x**3))
X3 = Matrix([ones(len(x), 1)]).row_join(Matrix(x))
```