

**ENGI 1331: Exam 1 Review Session Problem****Background**

You are given a .mat file named **School\_Data.mat**. Once loaded, two variables will show up in your workspace:

- **School\_Names**: an n x 1 string array with names of schools
- **Reading\_Data**: an n x 4 matrix with data for the schools from 2016. The first column in the matrix has the total number of kindergarteners at each school, the second column has the number of kindergarteners that are below the target reading level at each school, the third column has the number of kindergarteners that are on the target reading level at each school, and the fourth column has the number of kindergarteners that are above the target reading level at each school.

For clarity, each row represents one school such that the first element in **School\_Names** will be the name of a school, and the first row in **Reading\_Data** has the reading level data for that school.

**Task 1****Main Script:**

Load in **School\_Data.mat**. Create an output to the command window that tells the user the total number of elementary schools in the district and the total number of kindergarteners in the district. Then create another output to the command window that tells the user the average number of kindergarteners per elementary school in the district.

**Task 2****Function:**

Create a function named **CompareSchools\_Cougarnet** (replace with your cougarnet username) that returns the following outputs given name of the schools and the reading level data.

Function Inputs:

1. School names vector
2. Reading data matrix

Function Outputs:

1. A three-column matrix that lists, for each school, the percentage of kindergarteners below the target reading level in the first column, percentage of kindergarteners on target reading level in the second column, and percentage of kindergarteners above the target reading level in the third column.
2. A 3x1 string array with the first element being the name of the school with the highest percentage of kindergarteners below target reading level, the second element being the name of the school with the highest percentage of kindergarteners on target reading level, and the last element being the name of the school with the highest percentage of kindergarteners above target reading level.

The function header should be formatted similarly to the following:

```
function [out1,out2] = CompareSchools_Cougarnet(in1,in2)
```

Remember you are free to use whatever variable names you want, but they must be listed in the same order as given in the input/output lists provided above.

**Main Script**

Using your function **CompareSchools\_Cougarnet** find the below-level, on-level and above-level percentages associated with each school as well as the name of the schools with the highest number of below-level, on-level and above-level kindergarteners.

Save the two variables in a .mat file names Task2\_Results.mat and output the name of the schools with the highest number of below-level, on-level and above-level kindergarteners to the command window.

**Task 3****Function:**

Create a function named **Performance\_Cougarnet** (replace with your cougarnet username) that returns the following outputs given name of the schools and the percentages obtained in Task 2.

Function Inputs:

1. School names vector
2. 3 column matrix that lists the percentages of below-level, on-level and above-level kindergarteners for each school

Function Outputs:

1. A string array that lists the names of the underperforming schools. The school district considers a school to be underperforming if more than 30 percent of the kindergarteners are below the target reading level.
2. A string array that lists the names of the exceptionally performing schools. The school district considers a school to be performing exceptionally if less than 15 percent of the kindergarteners are only below the target reading level.

The function header should be formatted similarly to the following:

```
function [out1,out2] = Performance_Cougarnet(in1,in2)
```

Remember you are free to use whatever variable names you want, but they must be listed in the same order as given in the input/output lists provided above.

**Main Script:**

Using your function **Performance\_Cougarnet** obtain the lists of underperforming and exceptionally performing schools. Save the two variables in a .mat file named Task3\_Results.mat.

**Task 4****Main Script:**

Allow the user to select one of the underperforming schools from a menu. For each underperforming school, the school district has a five-year plan to decrease the number of kindergarteners below reading level, by two each year, and to increase the number of kindergarteners both on target and above target by one each year.

Assuming the district's plan were to work, for the underperforming school chosen by the user, create a plot showing the number of kindergarteners at, below and above the target reading level for each of the next 5 years (include the current year, 2020). The number of kindergarteners below target level should be plotted using red circles, kindergarteners at target reading level in blue triangles, and kindergarteners above target level using green squares. Include axis labels, a title and gridlines. (See sample plot below.)

*HINT:* Start by creating a matrix which contains the reading data associated with the underperforming schools or alternatively, you can use the find function.

Sample Output:

**Task 1**

There are 26 elementary schools in the district and a total of 2490 kindergarteners. There is an average of 96 students per school.

**Task 2**

| Key_Schools |         |         |         |
|-------------|---------|---------|---------|
| Percentages |         |         |         |
| 26x3 double |         |         |         |
|             | 1       | 2       | 3       |
| 1           | 24.3902 | 50      | 25.6098 |
| 2           | 21.2121 | 58.3333 | 20.4545 |
| 3           | 23.5955 | 59.5506 | 16.8539 |
| 4           | 16.9492 | 62.7119 | 20.3390 |
| 5           | 32.8947 | 42.1053 | 25      |
| 6           | 23.3766 | 59.7403 | 16.8831 |
| 7           | 32.6531 | 40.8163 | 26.5306 |
| 8           | 29.8246 | 42.9825 | 27.1930 |
| 9           | 13.8158 | 65.1316 | 21.0526 |
| 10          | 47      | 43      | 10      |

| Key_Schools |                    |
|-------------|--------------------|
| 3x1 string  |                    |
|             | 1                  |
| 1           | Robinson Elemen... |
| 2           | Hyde Elementary    |
| 3           | Ward Elementary    |
| 4           |                    |
| 5           |                    |

Robinson Elementary has the highest number of kindergarteners below the target reading level  
 Hyde Elementary has the highest number of kindergarteners on the target reading level  
 Ward Elementary has the highest number of kindergarteners above the target reading level

**Task 3**

| Exceptional     |                       |   |
|-----------------|-----------------------|---|
| UnderPerforming |                       |   |
| 9x1 string      |                       |   |
|                 | 1                     | 2 |
| 1               | Clear Lake City El... |   |
| 2               | Ferguson Elemen...    |   |
| 3               | Greene Elementary     |   |
| 4               | Hall Elementary       |   |
| 5               | Landolt Elementary    |   |
| 6               | League City Elem...   |   |
| 7               | Robinson Elemen...    |   |
| 8               | Whitcomb Eleme...     |   |
| 9               | White Elementary      |   |
| 10              |                       |   |

|             |                    |
|-------------|--------------------|
| Exceptional |                    |
| 2x1         | string             |
|             | 1                  |
| 1           | Goforth Elementary |
| 2           | Ross Elementary    |
| 3           |                    |

#### Task 4



