

# **EECS1520 – Assignment 4**

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### Instructions:

#### Important Reminders

- The deadline is strict, with no excuses: **you receive 0 for not making your electronic submission in time**. Emailing your solutions to the instructors or TAs will not be acceptable.

#### Academic Honesty

- Students are expected to read the [Senate Policy on Academic Honesty](#). See also the [EECS Department Academic Honesty Guidelines](#).
- **All Assignment are to be completed individually: no group work is allowed. Do not discuss solutions with anyone other than the instructor or the TAs. Do not copy or look at specific solutions from the net. If you are repeating the course, you are not allowed to submit your own solution developed in previous terms or for other purposes. You should start from scratch and follow the instructions.**

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# Important pre-assignment works you need to do before you start solving the Assignment

- a. Read Chapters 3 and 4 of the Glad manual supplied with this Assignment to learn more about Excel's IF function, logic functions and Text Functions.
- b. Read more about Implicit intersection Operator @ and the #SPILL! Error. Check the following [link](#).
  - a. Note: In case you get unexpected values or #SPILL! Error with formulas you use, add the implicit intersection operator (@) in front of range names. Example: range name *pass\_mark* with the implicit operator is *@pass\_mark*.

Feel free to find online resources on these and share them with your classmate on the discussion forum

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### Part One: Assignment Structure

Download the starter Excel file named "[PatientVisit.xlsx](#)" from the eClass course site

The file contains several worksheets as follows:

- **PatientVisits**: worksheet contains the data about patient visits. Check the header of the columns

Row_ID
Date of Admit
Date of Discharge
Doctor Full Name
Hospital Branch
Department Type
Department
Patient ID
Patient Name
Patient Risk Profile
Revenue
Minutes to Service
Number of Patient Visits

- **Task1**: worksheet where you have to implement [Task1](#).
- **Task2**: worksheet where you have to implement [Task2](#)
- **Task3**: worksheet where you have to implement [Task3](#)

### Part Two: Task1

**Important note:** All formulas must use range names

**Step1.** Go to the worksheet named "**Task1**".

**Step2.** Write a formula that yields the doctor's **Hospital Branch**, **Department Type** and **Department** from a given **doctor's name**. i.e., once you write the doctor's name in cell **A3** the following cells, **B3**, **C3**, and **D3**, will be updated with the required information.

*Note: You need to make sure that you return an **exact match**.*

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**Step3.** Write a formula that yields the **Total number of patient visits** the given doctor sees. You have to write the formula in cell **B7**.

**Step4.** Write a formula that yields the **Total Revenue** for the given doctor. You have to write the formula in cell **C7**.

**Step5.** Given the doctor's full name written by you in cell **A3**, you need to write a formula to create the doctor's email address according to the following rule, the first letter of the doctor's first name followed by the doctor's last name and then add **@hospital branch.com** to the end. Note: If the doctor's last name contains space, you need to replace the space with an underscore symbol.

Example1: if the doctor's full name is **Jonas Salk**, the email should be **JSalk@South.com**

Example2: if the doctor's full name is **Robert Reynolds Macintosh**, the email should be **RReynolds\_Macintosh@Central.com**

**Hint:** you probably need to use text functions *LEFT, RIGHT, FIND, SUBSTITUTE, LEN* etc. See ch 4 of glade manu for more information.

**Step6.** Check Figure 1-3 for sample output.

	A	B	C	D
1				
2	<b>Doctor Full Name</b>	<b>Hospital Branch</b>	<b>Department Type</b>	<b>Department</b>
3	Robert Reynolds Macintosh	Central	Specialty	Anaesthetics
4				
5				
6		<b>Total Number of Patient Visits</b>	<b>Total Revenue</b>	<b>Doctor Email</b>
7		173	374022	RReynolds_Macintosh@Central.com

Figure 1 Task1 Sample Output-1

	A	B	C	D
1				
2	<b>Doctor Full Name</b>	<b>Hospital Branch</b>	<b>Department Type</b>	<b>Department</b>
3	Jonas Salk	South	Intensive Care	ICU
4				
5				
6		<b>Total Number of Patient Visits</b>	<b>Total Revenue</b>	<b>Doctor Email</b>
7		491	2404777	JSalk@South.com

Figure 2 Task1 Sample Output-2

	A	B	C	D
1				
2	<b>Doctor Full Name</b>	<b>Hospital Branch</b>	<b>Department Type</b>	<b>Department</b>
3	Ivan Magill	South	Specialty	Anaesthetics
4				
5				
6		<b>Total Number of Patient Visits</b>	<b>Total Revenue</b>	<b>Doctor Email</b>
7		164	360697	IMagill@South.com

Figure 3 Task1 Sample Output-3

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### Part Three: Task2

Important note: All formulas must use range names

**Step7.** Go to the worksheet named "Task2".

The hospital administration wants to reward the doctors according to the number of patient visits by giving them bonuses. The bonus is fixed for the first 50 patient visits, but as the doctor sees more patients, the bonus increases, as shown in the below table.

Table 1 Bonus Visit Scale

Number of Visits	Bonus per Visit
1-50	\$ 2.00
51-100	\$ 6.00
101-250	\$ 7.00
251-400	\$ 9.00
401 or Higher	\$ 12.00

**Step8.** Write a formula that yields the total bonus for a given doctor specified in Task1. You have to write the formula in cell **B11**.

**Example1:** if the doctor has 57 patient visits, the doctor will get a \$2.00 bonus per visit for each of the first 50 visits and \$6.00 for each of the next seven visits.

**Example2:** If the doctor has 160 visits, the doctor will get a \$2.00 bonus for each of the first 50 visits, \$6.00 for each of the next 50 visits, and \$7.00 for each of the last 60 visits.

For Dr. **Robert Reynolds Macintosh** specified in Task1, B11 should show **911**

For Dr. **Jonas Salk** specified in Task1, B11 should show **3892**

For Dr. **Ivan Magill** specified in Task1, B11 should show **848**

**Hint:** You probably need at least three columns in your table range, and your formula might involve two lookup functions.

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### Part Four: Task3

Important note: All formulas must use range names

**Step9.** Go to the worksheet named "Task3".

The hospital administration wants to examine the relationship between the **monthly patient visits** and the **monthly revenue**.

**Step10.** Write a formula that yields the total number of patient visits for each month. You have to make sure that your formula fills the cell range **B2:B13**

**Step11.** Write a formula that yields the total revenue for each month. You have to make sure that your formula fills the cell range **C2:C13**

To determine how the patient visits are related to total revenue, the hospital administration wants to generate **Scatter Chart**.

**Step12.** Insert a **Scatter** chart as an object in the **Task3** worksheet. Click **Scatter** in the Charts group on the Insert tab and select the first option as the chart type.

Note: The chart **Width is 10cm**, and the **height is 17cm**.

**Step13.** Add a **trendline** to the scatter chart. Make sure the trend line colour is **red** (RGB = #FF0000), and the width is 2.5. In the Format Trendline dialogue box, select **Linear** and then select the **Display Equation On Chart** and the **Display R-Squared Value On Chart** checkboxes.

**Step14.** Select the text box that displayed linear equation ( $y = Ax + B$ ) and the R-square value and make the font size 11. See the below Figure 4. **We hide the value of  $A$ ,  $B$  and  $R^2$  in Figure 4, you should not hide these values in your solution for this Assignment.**

**Hint:** The constant  **$B$**  is called *intercept*, which is interpreted as the fixed monthly revenue. The constant  **$A$**  is called *slope*, which indicates that each extra patient visit will increase the monthly revenue by  **$A$**  amount. Therefore, even if the hospital has no patient visits, the hospital obtains a fixed monthly income from other services. The  $R^2$  value shows how much the linear relationship explains the variation in monthly revenue. For example, if  $R^2 = 0.69$ , then the linear relationship explains 69 percent of the variation in monthly revenue and other factors explain the remaining 31 percent of the variation in monthly revenue.

**Step15.** Insert a Text box with a yellow background in the generated **Scatter** chart, as shown in Figure 4. The font type is Arial, and the size is 10. Inside the inserted text box, write your first and last name.

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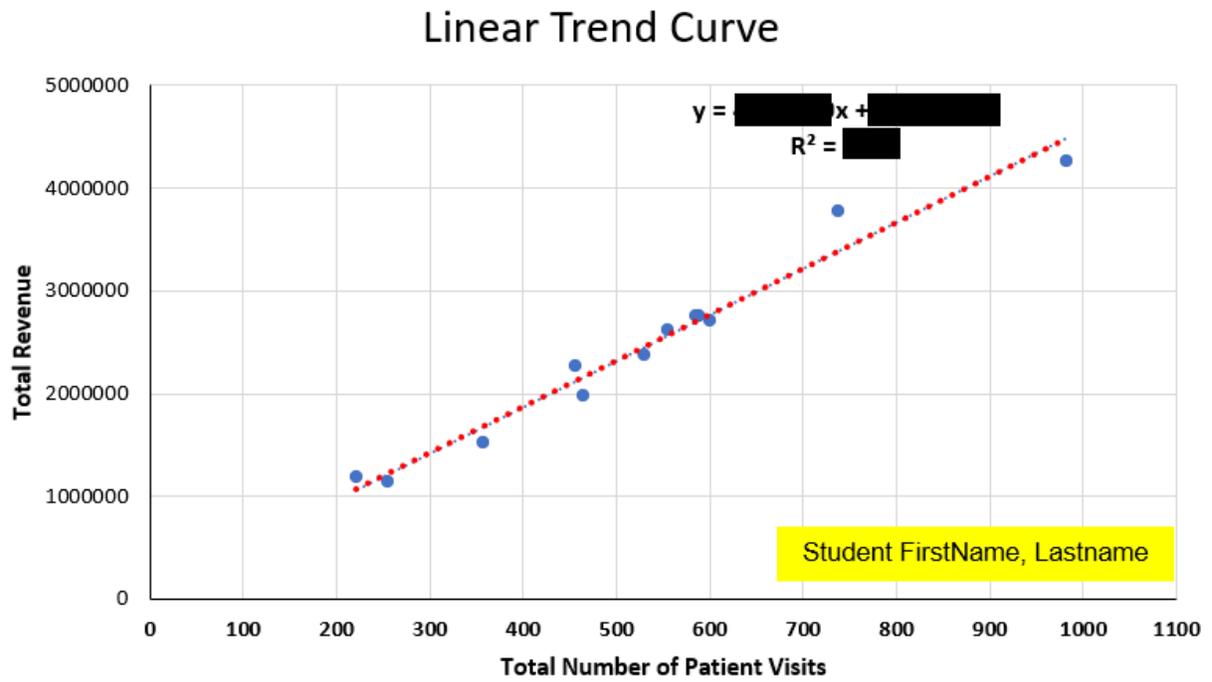


Figure 4 Task3 Scatter Chart output. We hide the value of A and B in the linear equation, but in your solution for this Assignment, you should not hide these values.

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# Submit your work by using the course eClass

### Check List:

Before submitting your files for this lab, you need to make sure you completed the following

	All formulas must use range names
	TASK1 implemented and tested
	TASK2 implemented and tested
	TASK3 implemented and tested
	TASK3 scatter chart is created according to the given sample output.
	TASK3 Chart width and height correctly specified
	TASK3 constant values are correctly obtained
	TASK3 write your first name and last name inside the text box

## **EECS1520 – Assignment 4**

### Submit The Following Files:

- 1) You need to submit the [PatientVisit.xlsx](#) file

To submit your work, you need to use York [eClass](#).