ISM 6405 Mid Term Exam

Instructions

This test consists of six separate problems. You should download the Excel spreadsheets found in Blackboard under the Assignments tab where needed to your computer, perform the required operations, save each of the solutions to your storage device, and, when done, upload **all six solutions in separate workbooks** to Blackboard.

**Part 0: Pre Exam Steps (4 points)**

For each workbook created below, place the problem number in cell **B3** of the documentation sheet, your name in cell **B4** and a date function that will reflect the current date when the workbook is opened in cell **B5**. For all VBA programs, be sure to include a button.

**Please include in the question 1 documentation sheet a statement that indicates that you did not work with others in arriving at your solutions to the questions.** (You may contact me for clarification but no others.)

**Part 1: Excel**

**Problem 1. (36 points)**

Every two weeks, the payroll information (found in **Problem1.xlsx**) for employees whose salaries are paid fully or partially from research grants is processed. This Excel workbook is used to calculate overhead. The overhead rate varies depending on the research grant. The data arrived somewhat messed up. You are to clean and format the data in the worksheet by completing the following: (Remember, while you are only working on a subset of the data, the entire file contains some 40,000 records. Way too much to clean up by hand.)

Your tasks using the text commands we studied are (for each step below, insert a separate worksheet labeled Step a, Step b, etc. Then complete each step, leaving any Excel commands used to perform the step in the worksheet. When you copy your results from the preceding step, remove the Excel commands where necessary. For example, you might use a command to remove the blanks from the beginning and ending of names. The column where you do that will have the function in the column. Place the results in a separate column which only has the names in it. Use that column for step b):

a. Using the data found on the **Period 10** worksheet, remove all extra spaces and “\*” from the Data. Rename this worksheet **Step a**. Copy the copy the results of this step to a new worksheet named **Step b**

b. In the **Step b** worksheet create three new column headers, starting with Column C as follows: **LastName**, **FirstName** and **GrantData**. Extract the data in the Research Grant Data column into these three columns. Make sure that all data can be seen in each column, convert the data in these three columns into a table named **Research Data**, sort the table by the **LastName** data and, using only table commands, place a count of the number of last names in the table at the bottom of the table. Finally, copy this table into a new worksheet named **Step c**, starting with cell **A1**.

c. In the **Step c** worksheet, change the name of the table to **OverheadCalculation**. Hide the filter arrows. Add a column named **Salary** after the first name column that contains the salary data. (Salary information is the leading decimal information in the **GrantData** column. Copy this table to a worksheet named **Step d**.

d. In the **Step d** worksheet extract the grant number from the **GrantData** column and display it in a new column labeled **GrantNbr**. The grant number is the first four-digit number found after the second hyphen of the **GrantData** column. Copy this table to a worksheet named **Step e**.

e. In the **Step e** worksheet, in the column to the right of the **GrantNbr** column enter a function to find the grant number in the lookup table in the **Overhead Rates** work-sheet and display the grant name the lookup table. Change the column header to **GrantName**. Make sure you can see all the data in the column. Copy this table to a worksheet named **Step f**.

f. In the **Step f** worksheet, in the column to the right of the **GrantName** column, use a function to calculate overhead for each person in the table. Name this column **Overhead**. Copy this table to a worksheet named **Step g**.

g. In the **Step g** worksheet format the **Salary** and **Overhead** columns using the **Accounting** number format. Sort the table ascending by **GrantNbr** and, within **GrantNbr**, descending by overhead. Copy this table to a worksheet named **Step h**.

h. In the **Step h** worksheet Show in the body of the table the cost of overhead for each grant**.**

i. **Save your workbook as Problem1.**

**Problem 2. (18 points)**

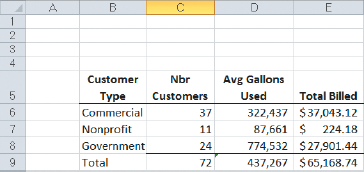
Open the file **Problem2**.xlsx. Create a series of Excel spreadsheets for a water company that determine different billing plans.

The company is a small independent water company that provides water to commercial customers throughout the region, delivering the water supply through pipelines, on-demand storage tanks, and bottles. Customers range from government offices to nonprofit organizations to commercial retail shops and markets. Town regulations tax the latter group of commercial customers based on their usage, whereas nonprofit and government offices are not taxed. Furthermore, the company will occasionally waive a water bill based on its charitable-giving policy. You are in charge of the billing system that must take into account these business rules and assure accurate and on-time billing, which occurs quarterly.

Complete the following:

1. In the **QuarterlyData** worksheet, create an Excel table named **WaterData**. Remove the filter arrows. Format the data in the **GalUsed** column with the comma style number format and no decimal places.
2. Add a column named **GalBilled** to the table, and then enter a formula to calculate the number of gallons billed based on the following rules: If a customer's bill is waived or the number of gallons used is less than 27,000 , display 0 in **GalBilled** column; otherwise, display the value from the **GalUsed** column in the **GalBilled** column.
3. Add a column named **WaterBill** to the table, and then enter a formula to calculate the water bill based on the following rules: The billing rate varies based on the type of customer. The billing rate is $3, $2, or $1.75 per *thousand* gallons billed, depending on the customer type (see the lookup table in the **BillingRate** worksheet). For example, a commercial customer using 75,000 gallons has a water bill of $225, whereas a government customer using 100,000 gallons pays $150. Some customers could have a water bill of $0.
4. Add a column named **Tax** to the table, and then enter a formula to calculate the tax based on the following rule: If a customer pays tax then multiply the **WaterBill** by the tax rate found in cell M1; otherwise, the tax is 0.
5. Add a column named **TotalBill** to the table, and then enter a formula to calculate the bill amount by adding the **WaterBill** column and the **Tax** column.
6. Improve the formatting of the number fields in the **WaterData** table.
7. Add a Totals row to the Excel table displaying totals for the **GalUsed**, **GalBilled**, **Tax**, and **TotalBill** columns.
8. Make a copy of the **QuarterlyData** worksheet, rename the copied worksheet as **Conditional**, and then use conditional formatting to highlight the top 15 percent of the **TotalBill** amounts with a yellow background color. Filter the table so that only the top 15 percent are displayed. Sort the filtered table by largest to smallest.
9. Insert a new worksheet, rename the worksheet as **BillingSummary**, and then create the report shown below, using COUNTIF, AVERAGEIF, and SUMIF as needed to prepare the report. (Note the numbers in the example are for illustrative purposes only and may not reflect your results.)

**Water usage and billing by customer type**



Save the workbook as **Problem2.xlsx.**

**Problem 3 (12 points)**

Using the **Problem3.xlsx** dataset, answer the following questions using the worksheets found in the workbook (Q1 for question a, Q2 for question b, etc.)

* 1. **(2 points)**Filter the list in place to display those funds who were in the top 15% of returns in 2014.
  2. **(6 points)**Filter the list and start the results in cell **H6**. You are to display sales which were greater than fifty-five units and whose per-unit price was no larger than $3.15 during 2005. Display in the body of the table the total sales for each salesperson.
  3. **(4 points)** Filter the list and copy to v2 to display those 2012 return were greater than the 2011 return and less than the 2013 return or in the top 20 % of 2014 returns.

**Save your workbook as Problem3.**

**Part 2 VBA**

**Problem 4 (4 points)**

A milk carton can hold 3.78 liters of milk. Each morning, a dairy farm ships cartons of milk to a local grocery store. The cost of producing one liter of milk is $0.50 and the profit of each carton of milk is $0.25. Write a VBA program that does the following:

a. Prompts the use to enter the total amount of milk produced in the morning.

b. Outputs the number of milk cartons needed to hold milk. (Round your answer to the nearest whole number.)

c. Outputs the cost of producing the milk (formatted to be dollars and cents).

d. Outputs the profit for producing the milk.

Save your Excel macro workbook as **Problem4**.

**Problem 5**

Using the data found in the file **Problem5.xlsx,** write a VBA sub that does the following:

1. **(1 points)** Asks the user for the number of products.
2. **(1 points)** finds the total sales for each product.
3. **(4 points)**  places the yearly total sales for each product in the Total Sold column. ( For example, cell N5 will have the total sales for product 1.)
4. **(4 points)** Find the total sale for all products and place that value in cell N1
5. **(4 points)** Has a MsgBox that tells the user that displays the following “You sold \_\_\_\_ products during the year \_\_\_\_ for a total value of \_\_\_\_\_ . The average of sales during the year was \_\_\_\_\_”.
6. **(2 points)** This problem must use **Do** loops in the solution and your program must force you to declare and type all variables.

Save your Excel macro workbook as **Problem5**.

**Problem 6**

XYZ Company has a product (GreenWidgets) that is price sensitive. When the price of the product is $600, they will sell 50 GreenWidgets. They wish to know if they are maximizing profits at that price or if there is another price that will yield more profit. They believe that each $50 increase in price will result in one less GreenWidget being sold. How many GreenWidgets will be sold to maximize profit and what will that profit be?

Write a VBA program that prompts the user to enter:

a. **(1 points)** the current product price that results in 50 GreenWidgets being sold.

b. **(1 points)** the increase in price that results in one less GreenWidget being sold.

c. **(8 points)**Your outputs should be the number of GreenWidgets sold to maximize profit and what the maximum profit at that number of sales would be.

You must use a **FOR** loop in this problem.

Hint. First solve this problem by hand. Note all the steps you go through to reach your solution and note what the value is at solution. You may, ask clarifying questions at any time on this or any other question in this exam. I will not give solutions, but will help clarify issues. If you are stuck on a piece of code, don’t spend a lot of time attempting to fix it, ask me and I will do my best to help without actually correcting the problem.

Save your Excel macro workbook as **Problem6.**