

Northeastern University

College of Computer and Information Science

CS1100: Excel Lab 2

To complete this assignment you must submit an electronic copy to BlackBoard by the due date. Use the starter file *cs1100.e2.xlsx*. In this lab you are asked to look up data and build flexible models. Use Excel help to figure out how to use the functions.

Knowledge Needed

This lab requires the following Excel functions and techniques:

- Cell ranges, borders, shading, cell formatting, number formatting
- **VLOOKUP** and **HLOOKUP** function to map data
- **IFERROR** function to build robust models
- **SUM** function to add values, **IF** function for filtering data
- Absolute vs. relative cell references
- Named ranges
- Copying of formulas
- Excel help and online documentation

Problem 1

The sheet “**Customers**” contains data from City Health Club. Customers are listed by a customer ID with the plan they signed up for and the date that they paid for the period starting on July 1st. You are given a spreadsheet with the data using a code for the plan.

The codes for the plans are as follows:

P = Platinum

G = Gold

S = Silver

The Platinum plan costs \$99 per period, the Gold plan costs \$75 per period and the Silver plan costs \$50 per period. If a customer does not want to sign up for a plan and has a no-frills membership, he/she pays \$20 per period.

Customers can get a discount for paying their dues early according to the following rules:

Customers who pay	Receive a discount of
0 <= days < 7 early	0%
7 <= days < 14 early	5%
14 <= days < 30 early	10%
30 <= days early	15%

You are asked to fill in the spreadsheet with the full text for each customer’s plan, the

discount offered and the amount paid.

1. Download, save, and then open the *cs1100.e2.xlsx* workbook.
2. Create a lookup table for the plan codes and prices that will use an **exact match**. Put your table in the worksheet titled “Health Club Tables” and name the table **PlansTable**.
3. Create an **interval** lookup table for the discount that will use an **inexact match**. Put your table in the worksheet titled “Health Club Tables” and name the table **DiscountTable**.
4. Fill in the column for “Discount” using a **VLOOKUP** function. (*Hint: You can find the difference between the dates by subtracting Payment Date from Start Date.*)
5. Fill in the columns for “Fees” and “Plan” using a **VLOOKUP** function
6. Calculate the total amount due after the discount
7. Use **IFERROR** to strengthen your **VLOOKUP** formulas so that your model will work even if a customer has no plan listed.
8. Using an **IF** statement, filter the data for each plan. You should be able to copy the IF statement down *and* across.
9. Using **SUM** calculate the total number of customers in each plan.
10. Make sure all of your formulas are copyable and resilient to changes in data.
11. Format the worksheet as shown in the figure below:

Customer #	Plan code	Start Date	Payment Date	Discount	Fees	Total Due	Plan	Platinum	Gold	Silver
1	P	7/1/2013	6/2/2013	10%	\$ 99.00	\$ 89.10	Platinum	1		
2	P	7/1/2013	6/30/2013	0%	\$ 99.00	\$ 99.00	Platinum	1		
3	S	7/1/2013	5/4/2013	15%	\$ 50.00	\$ 42.50	Silver			1
4	S	7/1/2013	6/5/2013	10%	\$ 50.00	\$ 45.00	Silver			1
5	G	7/1/2013	5/16/2013	15%	\$ 75.00	\$ 63.75	Gold		1	
6	S	7/1/2013	4/7/2013	15%	\$ 50.00	\$ 42.50	Silver			1
7		7/1/2013	6/8/2013	10%	\$ 20.00	\$ 18.00				
8	G	7/1/2013	7/1/2013	0%	\$ 75.00	\$ 75.00	Gold		1	
9	P	7/1/2013	6/10/2013	10%	\$ 99.00	\$ 89.10	Platinum	1		
10	S	7/1/2013	5/11/2013	15%	\$ 50.00	\$ 42.50	Silver			1
Totals:								3	2	4

Problem 2

North College offers discounts to faculty and staff who commute to work by public transportation based on the number of years they have worked at the college. The sheet “**Commuter Passes**” contains information about employees who have ordered commuter rail passes. Commuter Rail fares are based on a Zone number. The fares for Zones 1 – 10 are \$173, \$189, \$212, \$228, \$252, \$275, \$291, \$314, \$329 and \$345 respectively.

Employees receive discounts based on the following rules:

Employees who worked for:	Receive a discount of:
0 <= #years < 3	5% of the cost of the fare
3 <= #years < 5	10% of the cost of the fare
5 <= #years < 10	18% of the cost of the fare
10 <= #years < 20	22% of the cost of the fare
20 <= #years < 25	25% of the cost of the fare
25 years and above	30% of the cost of the fare

You are asked to build a model that calculates the fare, employee discount, and total due for each order. You need to use **VLOOKUP** and **HLOOKUP** to find the correct rates to use based on the data. Make sure your model continues to work if fares or discount rates change.

Complete the following:

1. In the *Commuter Passes* sheet, add your name to the last row after James Black, with Zone 6 and 1 year employed.
2. In the *Pass Fares* sheet, create a horizontal lookup table for the fares per zone. Name the range for the table **PassFares**.
3. In the *Employee Discount* sheet, create a vertical lookup table based on the rules for employee discounts in the table above. Name the range **DiscountRates**.
4. Using **HLOOKUP** find the fare for each order. Be sure to use the named range **PassFares** and an exact match lookup.
5. Using **VLOOKUP** calculate the discount for each order. Be sure to use the named range **DiscountRates** and an inexact match lookup.
6. Calculate the total due for the order. Make sure your formula is copyable.
7. Using **IFERROR**, strengthen your **lookup** formula so that your model will work even if an individual is not a full-time employee. Assume a discount rate of 0% if an employee's number of years employed is "NA".
8. Format the sheet as shown below (your solution should have your name included):

Employee	Zone	Years		Price	Discount	Total Due
		employed				
Tom Smythe	2	3		\$ 189.00	\$ 18.90	\$ 170.10
Betty Jones	4	7		\$ 228.00	\$ 41.04	\$ 186.96
Amy Kane	1	13		\$ 173.00	\$ 38.06	\$ 134.94
Will Bently	7	1		\$ 291.00	\$ 14.55	\$ 276.45
Jesse Liu	3	6		\$ 212.00	\$ 38.16	\$ 173.84
Nancy Sims	4	2		\$ 228.00	\$ 11.40	\$ 216.60
John Maynard	3	12		\$ 212.00	\$ 46.64	\$ 165.36
Jeff Greenfield	6	9		\$ 275.00	\$ 49.50	\$ 225.50
Luis Reyes	7	10		\$ 291.00	\$ 64.02	\$ 226.98
Liza James	8	5		\$ 314.00	\$ 56.52	\$ 257.48
Amanda Garth	5	3		\$ 252.00	\$ 25.20	\$ 226.80
Liam Benson	5	NA		\$ 252.00	\$ -	\$ 252.00
Zahra Salem	8	2		\$ 314.00	\$ 15.70	\$ 298.30
Neil O'Hara	6	0		\$ 275.00	\$ 13.75	\$ 261.25
John Reese	7	6		\$ 291.00	\$ 52.38	\$ 238.62
James Black	2	10		\$ 189.00	\$ 41.58	\$ 147.42

GRADING RUBRIC

This rubric is intended to guide graders in their evaluation of the students' submissions.

Problem 1 – 50 points

Criterion	Grading
Named ranges are defined	3 points for each table
Named ranges are used in VLOOKUP functions	2 points for each
Correct lookup formulas for Plan and Discount	5 points each formula
Correctly set tables	5 points each
IF statement used correctly to filter data	10 points
Correct values and formulas for totals	2 points
Correct handling of lookups if data is missing using IFERROR	5 points
Correct formatting (bold header, shaded header, border above sums)	3 points

Problem 2 – 50 points

Criterion	Grading
Named ranges are defined	2 points each
Named ranges are used in VLOOKUP and HLOOKUP functions	2 points each
Correct values for price and discount	5 points each
Correctly set up price lookup table	5 points
Correct set up for discount lookup table	5 points
Correct handling of lookups if years employed is not found in table using IFERROR	10 points
Correct values for total due	5 points
Correct formatting of columns (bold header, shaded header, border, Accounting format)	2 points
Student's name is added after James Black	5 points