

CS 105: Sample Midterm Exam #2
Spring 2014 Exam

1. In math, the absolute value of a number is the non-negative value of the number. For example, the absolute value of -3 is 3 and the absolute value of 4 is still 4 . Which of the following Excel formulas finds the absolute value of the number in cell **A1**?
 - A. `=IF(A1 = 0, A1, -A1)`
 - B. `=IF(A1 < 0, A1, -A1)`
 - C. `=IF(A1 > 0, A1, -A1)`
 - D. `=IF(A1 = -A1, A1, -A1)`
 - E. `=IF(A1 < 0 < A1, A1, -A1)`

2. How many cells in Excel are included in the range **A2:A6**?
 - A. 4
 - B. 5
 - C. 6
 - D. 10
 - E. 12

3. How many cells in Excel are included in the range **A5:B10**?
 - A. 4
 - B. 5
 - C. 6
 - D. 10
 - E. 12

4. A pivot table in Excel allows the user to place columns of the original worksheet into all of the following categories **except**?
 - A. Column Labels
 - B. Formulas
 - C. Report Filter
 - D. Row Labels
 - E. Values

5. Which of the following statements is correct?
 - A. An Excel file may contain only one pivot table.
 - B. An Excel spreadsheet may contain only one pivot table.
 - C. An Excel workbook may contain only one pivot table.
 - D. An Excel spreadsheet may contain multiple workbooks.
 - E. An Excel workbook may contain multiple spreadsheets.

6. Which of the following concept from JavaScript best represents **A2:A6**?
 - A. Number
 - B. Array
 - C. Function
 - D. Conditional
 - E. Loop

For the next four questions, consider the following Excel spreadsheet. Note that cell F2 shows an Excel formula that has yet to be entered and evaluated.

| | A | B | C | D | E | F |
|---|-----------------|------------------|------------------|--------------|--------------|--------------|
| 1 | Student | Midterm 1 | Midterm 2 | Final | Total | Grade |
| 2 | Alice | 150 | 110 | 200 | 460 | =E2/B9 |
| 3 | Bob | 130 | 100 | 200 | 430 | |
| 4 | Charlie | 120 | 120 | 100 | 360 | |
| 5 | Eve | 150 | 100 | 150 | 400 | |
| 6 | | | | | | |
| 7 | Top Student: | | | | | |
| 8 | Final Exam Avg: | | | | | |
| 9 | Maximum Points: | 500 | | | | |

7. What is the result of the formula =MATCH(B2:B5, 150, 0)?
 - A. 1
 - B. 2
 - C. 3
 - D. 4
 - E. 5

8. Which, if any, of the following formulas would correctly return the name of the student with the highest score (column E)? (This formula would be placed into B7.)
 - A. =VLOOKUP(MAX(E2:E5), A2:E5, 5, TRUE)
 - B. =VLOOKUP(MAX(E2:E5), A2:E5, 5, FALSE)
 - C. =INDEX(A2:A5, MATCH(MAX(E2:E5), E2:E5, 0))
 - D. =INDEX A2:A5, MATCH(MAX(E2:E5), E2:E5, 0))
 - E. None of the above

9. Which, if any, of the following formulas would correctly return the average score for the final exam (column D)? (This formula would be placed into B8.)
 - A. =COUNT(D2:D6)
 - B. =SUM(D2:D6)
 - C. =COUNT(D2:D6) / SUM(D2:D6)
 - D. =SUM(D2:D6) / SUM(D2:D6)
 - E. None of the above

10. Suppose the user enters the formula =E2/B9 into cell F2 (as shown) to calculate the final course grade as a percentage and then copied F2 and pasted it into F3:F5. Which student would have the lowest percentage grade shown?
 - A. Alice
 - B. Bob
 - C. Charlie
 - D. Eve
 - E. Only one student would have a percentage grade

For the next four questions, consider the following Excel spreadsheet. If a value does not appear in the sheet, it should be considered empty (eg: **E1**, **A4**, etc).

| | A | B | C | D | E | F |
|----------|----------|----------|----------|----------|----------|----------|
| 1 | 3 | 5 | 1 | 2 | | |
| 2 | 2 | 3 | 5 | 2 | | |
| 3 | 4 | 5 | 7 | 2 | | |

11. What is the value of the formula:

`=IF(A3<B3, IF(A3<C3, "Small", "Medium"), "Large")`

- A. Small
- B. Medium
- C. Large
- D. A3<B3
- E. A3<C3

12. What is the value of the formula: `=SUMIF(B1:B3, ">" & 3, C1:C3)`

- A. 3
- B. 5
- C. 7
- D. 8
- E. 13

13. Suppose the formula `=MAX(A1:A4, A$1:D1, D:D)` is entered into cell **E1**. What value will be calculated by Excel in the cell **E1**?

- A. 2
- B. 3
- C. 4
- D. 5
- E. 7

14. Suppose the formula from the previous question was copied from **E1** and pasted into **F3**. What value will be calculated by Excel in the cell **F3**?

- A. 2
- B. 3
- C. 4
- D. 5
- E. 7

For the next seven questions (spanning this page and the next page), consider the following Excel workbook. For the next three questions, consider only this first spreadsheet. Note that the population column represents the city's population in millions of people.

| | A | B | C | D | E | F | G |
|--------------------|---------------|-------------------|-------------------|-------------------|--------------|-----------------|----------------|
| 1 | City | State | Population | California | Texas | Illinois | Water |
| 2 | New York City | New York | 8.34 | | | | Atlantic |
| 3 | Los Angeles | California | 3.86 | | | | Pacific |
| 4 | Chicago | Illinois | 2.71 | | | | Lake Michigan |
| 5 | Houston | Texas | 2.16 | | | | Gulf of Mexico |
| 6 | Phoenix | Arizona | 1.49 | | | | None |
| 7 | San Antonio | Texas | 1.38 | | | | None |
| 8 | San Diego | California | 1.39 | | | | Pacific |
| 9 | Dallas | Texas | 1.24 | | | | None |
| Sheet Name: | | Population | Employment | | | | |

15. Suppose the formula =IF(\$B2=D\$1, \$A2, 0) is entered into cell D2. What value will Excel calculate for the cell D2?

- A. 0
- B. 8.34
- C. New York City
- D. New York
- E. California

16. After entering the formula from the previous question into D2, suppose we copy the cell D2 and paste it into D2:F9. After pasting the formula, how many cells in the range D2:F9 contains 0?

- A. 0
- B. 6
- C. 12
- D. 18
- E. 24

17. After pasting the formula described in the previous question into D2:F9, what is the value of the formula: =COUNTA(D:D) - COUNT(D:D)?

- A. 0
- B. 3
- C. 4
- D. 5
- E. 6

For the next three questions, continue using the spreadsheet from the previous sheet and consider this second spreadsheet in the same workbook:

| | A | B | C | D | E | F |
|--------------------|---------------|-------------------|-------------------|---|---|---|
| 1 | City | Unemployed | Rate | | | |
| 2 | Chicago | 314,000 | | | | |
| 3 | Dallas | 100,300 | | | | |
| 4 | Houston | 185,800 | | | | |
| 5 | Los Angeles | 536,500 | | | | |
| 6 | New York City | 775,300 | | | | |
| 7 | Phoenix | 167,000 | | | | |
| 8 | San Antonio | 100,700 | | | | |
| 9 | San Diego | 146,000 | | | | |
| Sheet Name: | | Population | Employment | | | |

18. What is the value of the formula: =INDEX(Employment!A:A, 3) ?

- A. Chicago
- B. Dallas
- C. Houston
- D. Los Angeles
- E. New York City

19. Suppose we want to calculate the unemployment rate (a percentage) for each of the cities listed. For example, Chicago's unemployment rate is an unfortunate 0.116 (11.6%). Which formula can be inserted into cell c2 to correctly calculate the unemployment for Chicago?

- A. =100 * (B2 / (VLOOKUP(A2, Population!A2:C9, 3, FALSE) * 1000000))
- B. =B2 / (VLOOKUP(A2, Population!A2:C9, 3, FALSE) * 1000000)
- C. =100 * ((VLOOKUP(A2, Population!A2:C9, 3, FALSE) * 1000000) / B2)
- D. =(VLOOKUP(A2, Population!A2:C9, 3, FALSE) * 1000000) / B2
- E. =100 * B2 * (VLOOKUP(A2, Population!A2:C9, 3, FALSE) / VLOOKUP(A2, Population!A2:C9, 3, FALSE))

20. Suppose we want to copy and paste cell c2 into c3:c9. Which value(s) from the previous question's formula must have at least one \$ added?

- (i): A2 (employment sheet)
- (ii): B2
- (iii): Population!A2:C9

- A. (i) only
- B. (ii) only
- C. (iii) only
- D. (i) and (ii) only
- E. (i) and (iii) only

FR1. Write a formula that can go into cell Employment!E2 which displays the **name of the state** whose city has the **lowest** unemployment rate. This formula must dynamically look at the unemployment rate, find the lowest, and not simply reference the city; *you should assume that column c has data filled in for your answer.*

...answer this question on your free response answer sheet as question FR1.

For the next four questions, consider the following Excel spreadsheet:

| | A | B | C | D | E | F |
|---|----------------------|-----------------|-----------------|-----------------|----------------|----------------|
| 1 | Coffee House | Rating 1 | Rating 2 | Rating 3 | Average | Comment |
| 2 | ERC: Union | 4.9 | 3.1 | 2.8 | | |
| 3 | ERC: Library | 4.1 | 4.2 | 3.1 | | |
| 4 | ERC: Daniel St. | 4.0 | 4.7 | 3.4 | | |
| 5 | ERC: Goodwin St. | 3.7 | 4.9 | 3.5 | | |
| 6 | ERC: BIF | 3.2 | 3.7 | 3.8 | | |
| 7 | Starbucks: Bookstore | 2.9 | 3.9 | 3.9 | | |
| 8 | Starbucks: Green St. | 2.9 | 4.1 | 4.1 | | |
| 9 | Bevande (Siebel) | 1.7 | 1.0 | 4.4 | | |

21. What is the value of the formula: `=INDEX(A2:A9, COUNTIF(A:A, "ERC*"))`
- 0
 - 5
 - 6
 - A:A
 - ERC: BIF
22. To ensure that you get a correct result, which is the only column that can be used to find the `lookup_value` in `VLOOKUP` when the `range_lookup` is `TRUE`?
- Column A
 - Column B
 - Column C
 - Column D
 - Column E
23. Suppose we want calculate an average rating in Column **E** that includes only the **two lowest ratings** for each coffee house. Which formula, typed into **E2** and then copied and pasted into **E3:E9**, would calculate this average correctly?
- `=AVERAGE(B2:D2)`
 - `=AVERAGE(MAX(B2:D2), MIN(B2:D2))`
 - `=AVERAGE(IF(B2<B2, B2, C2), IF(C2<D2, C2, D2))`
 - `=AVERAGE(IF(B2<C2, B2, C2), IF(B2<D2, B2, D2))`
 - `=(SUM(B2:D2) - MAX(B2:D2)) / 2`
- FR2.** Write a formula for cell **F2**, which can be copied and pasted into **F3:F9**, which displays "Lowest Rated" in the cell if and only if the rating calculated in column **E** is the lowest rating among all of the coffee houses listed. Otherwise, nothing should be shown.
...answer this question on your free response answer sheet as questions FR2.
- FR3.** In lecture, it was said that the Excel `MATCH` function would run differently depending on if the third parameter was zero or non-zero. Which would run faster? What is different that makes it faster?
...answer this question in three sentences or less on your free response answer sheet as questions FR3.

For the next three questions, consider the following sheet of United Nations population data that was presented in lecture during two different lectures. As in lecture, there are over 2,000 rows that include data from over 200 different countries for each year from 2000 until 2010 (inclusively, a total of 11 years). The sheet presented here includes only two columns of data, the population of the country and its GDP, as shown below.

| | A | B | C | D | E | F |
|------|----------------|-------------|-------------------|-------------------|---|---|
| 1 | Country | Date | Population | GDP (MM\$) | | |
| 2 | Afghanistan | 7/1/2000 | 25,950,816 | 2,281 | | |
| 3 | Afghanistan | 7/1/2001 | 26,697,430 | 2,461 | | |
| ... | ... | ... | ... | ... | | |
| 12 | Afghanistan | 7/1/2010 | 34,385,068 | 17,243 | | |
| 13 | Albania | 7/1/2000 | 3,071,856 | 3,686 | | |
| ... | ... | ... | ... | ... | | |
| 2239 | United States | 7/1/2006 | 301,231,207 | 13,314,500 | | |
| 2240 | United States | 7/1/2007 | 304,093,966 | 13,961,800 | | |
| ... | ... | ... | ... | ... | | |

24. If a pivot table was set up with the row values coming from the “Country” column and the column values coming from the “Date” values, how many times would “United States” appear in the pivot table?

- A. 0
- B. 1
- C. 10
- D. 11
- E. 100

25. Suppose you wrote an INDEX/MATCH function to look for an exact match of “Afghanistan” in column A and then return the population (column C) for the row that was selected. What value would be returned?

- A. 25,950,816
- B. 26,697,430
- C. 34,385,068
- D. 3,071,856
- E. There is not enough information to determine what row Excel would return.

26. Suppose you wrote a VLOOKUP function to look for an exact match of “Afghanistan” in column A and then return the population (column C) for the row that was selected. What value would be returned?

- A. 25,950,816
- B. 26,697,430
- C. 34,385,068
- D. 3,071,856
- E. There is not enough information to determine what row Excel would return.

For the next four questions, consider the following Excel spreadsheet:

| | A | B | C | D | E | F |
|---|---|---------------|---|---|---|---|
| 1 | 8 | 9 | 2 | | | I |
| 2 | 4 | 3 | 5 | | | L |
| 3 | 1 | 6 | 3 | | | L |
| 4 | | | | | | I |
| 5 | | =A1+\$B2+C\$3 | | | | N |
| 6 | | | | | | O |
| 7 | | | | | | I |
| 8 | | | | | | S |

27. What is the result of the formula in B5?

- A. 0
- B. 13
- C. 14
- D. 17
- E. Excel would generate an error (#ERROR!, #REF!, or similar)

28. Suppose the cell B5 is copied and then pasted in cell A4. What is the value in A4 after the formula has been pasted?

- A. 0
- B. 13
- C. 14
- D. 17
- E. Excel would generate an error (#ERROR!, #REF!, or similar)

29. Suppose the cell B5 is copied and then pasted in cell C8. What is the value in C8 after the formula has been pasted?

- A. 0
- B. 13
- C. 14
- D. 17
- E. Excel would generate an error (#ERROR!, #REF!, or similar)

30. After all of the copying and pasting of the previous three questions have been completed, what is the value of the formula: =COUNT(A:F)

- A. 9
- B. 11
- C. 17
- D. 19
- E. Excel would generate an error (#ERROR!, #REF!, or similar)