



- Name: _____
 - Date: _____
 - Section: _____
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BUSI 201: Business Data Analysis

Final Exam

Fall 2023

INSTRUCTIONS:

- Print your name and section number at the top of this page.
- Make sure that the exam is 9 pages long, including this one.
- You have up to 180 minutes to complete this exam.
- BUSI201-F2023-Final-Workbook.xlsx is the companion workbook for this quiz.
- The workbook consists of 11 worksheets, and the quiz booklet contains 8 problems.
- Once you finish, save or rename the workbook to **YOUR_LOGIN_ID.xlsx**, and submit your results via email to **BPARK@monmouthcollege.edu**.
- Double-check your submission email for the attached file, file name, and the recipient's email address. You won't be permitted to submit or update your solutions after 9:30 PM.
- Good luck, and have a great Winter Break!

Problem #1. Functions Part 1**(15 Points)**

Navigate to worksheet P01. This worksheet contains a hypothetical list of course offerings from some college. Use the information in the table to complete the following tasks. You **MUST** use functions to complete all tasks in this problem.

- **Task #1: Number of Courses Offered**

- Fill the cell highlighted by the **Red Box: A** with the total number of distinct courses offered by the college for Spring 2024. Then, fill the four cells highlighted by the **Blue Box: B** with the total number of courses offered by each department in the college for Spring 2024.
- **THE FUNCTION MUST WORK REGARDLESS OF HOW THE DATA IS SORTED.**

| Number of Courses Offered | | | | |
|---------------------------|----------|-----------|-------------------|-------------|
| Total | Business | Economics | Political Science | Engineering |
| A | | B | | |

- **Task #2: Number of Courses Offered**

- Fill the cell highlighted by the **Red Box: A** with the sum of all enrolled students in the college for Spring 2024. Then, fill the four cells highlighted by the **Blue Box: B** with the sum of enrolled students in the college for Spring 2024 by each department.¹
- **THE FUNCTION MUST WORK REGARDLESS OF HOW THE DATA IS SORTED.**

| Number of Students Enrolled | | | | |
|-----------------------------|----------|-----------|-------------------|-------------|
| Total | Business | Economics | Political Science | Engineering |
| A | | B | | |

- **Task #3: Search Information for Courses**

- Use the appropriate function(s) to fill out the **Red Box: A** with the corresponding information from the table on course offerings.

| Course Information Lookup | | | | |
|---------------------------|-------------|---------|----------|----------|
| Course Code | Course Name | Credits | Enrolled | Waitlist |
| ECON-310 | | | A | |
| BUSI-301 | | | | |

¹For the sake of simplicity, we will assume that one student only enrolls in one course.

Problem #2. Functions Part 2**(15 Points)**

Navigate to worksheet P02. This worksheet contains a hypothetical gradebook from a college course. Use the information to complete the following tasks. You MUST use functions to complete all tasks in this problem.

- Task #1: Total Score, Ranking, and Pass / Fail**

- Fill the cells highlighted by the **Red Box: A** with the total score of each student. The weights for each item that make up the total score are given in the **Orange Box: D**.²
- Fill the cells highlighted by the **Blue Box: B** with the rankings of each student based on the total score you calculated. The student with the highest score should be ranked 1.
- Fill the cells highlighted by the **Green Box: C** with whether the student passed or failed the course. A student fails the course if the total score is strictly less than 60 points.

| Student ID | First Name | Last Name | Attendance | Assignments | Quizzes | Midterm | Final | Total | Rank | Pass / Fail |
|------------|------------|-----------|------------|-------------|---------|---------|-------|-------|------|-------------|
| 74095 | Emily | Johnson | 100 | 97.84 | 80.6 | 98.78 | 65.34 | A | B | C |
| 50507 | Ethan | Davis | 76.76 | 89.96 | 90.14 | 78.66 | 61.67 | | | |
| 64484 | Olivia | Martinez | 91.39 | 94.39 | 98.87 | 53.89 | 98.95 | | | |

- Task #2: Summary Statistics**

- Fill the cells highlighted by the **Red Box: A** with the corresponding values based on the Total scores of the students.

| Summary Statistics (Based on Total Score) | | | |
|---|--------|---------|---------|
| Average | Median | Minimum | Maximum |
| A | | | |

- Task #3: Calculating the Rate of Failure**

- Fill the cell highlighted by the **Red Box: A** with the total number of students in this class.
- Fill the cells highlighted by the **Blue Box: B** with the number of students who passed/failed.
- Fill the cell highlighted by the **Green Box: C** with the ratio of students who failed the course.³

| Pass / Fail Statistics | | | |
|------------------------|--------------------|--------------------|-----------|
| # Total Students | # Passing Students | # Failing Students | Fail Rate |
| A | B | C | |

²The first student should have a total score of: $100 \cdot 10\% + 97.84 \cdot 10\% + 80.6 \cdot 15\% + 98.78 \cdot 25\% + 65.34 \cdot 40\%$.

³(# Students who failed)/(# Total students)

Problem #3. Filtering and Sorting**(15 Points)**

Problem 3 requires you to work on three worksheets, P03-1, P03-2, and P03-3. These three worksheets are duplicates, each containing a table of the top 50 grossing movies of 2023. Use the tables in these worksheets to complete the following tasks.

- **Task #1: Sorting**

- Navigate to the worksheet P03-1. Currently, the table is sorted so that the highest-grossing movies are on top. Sort the table so that movies that opened in the greatest number of theaters appear at the top. See the figure below for a preview.

| Rank | Title | Gross | # Theaters | Distributors |
|------|---------------------------------------|------------------|------------|-------------------------------------|
| 11 | Indiana Jones and the Dial of Destiny | \$174,480,468.00 | 4,600 | Walt Disney Studios Motion Pictures |
| 4 | Guardians of the Galaxy Vol. 3 | \$358,995,815.00 | 4,450 | Walt Disney Studios Motion Pictures |
| 2 | The Super Mario Bros. Movie | \$574,934,330.00 | 4,371 | Universal Pictures |
| 7 | Ant-Man and the Wasp: Quantumania | \$214,504,909.00 | 4,345 | Walt Disney Studios Motion Pictures |
| 1 | Barbie | \$636,190,846.00 | 4,337 | Warner Bros. |

- **Task #2: Filtering**

- Navigate to the worksheet P03-2. Apply filter(s) to the table so that movies distributed by **Walt Disney Studios Motion Pictures** that recorded a gross revenue greater than **\$100,000,000.00** appear on the table. See the figure below for a preview.

| Rank | Title | Gross | # Theaters | Distributors |
|------|---------------------------------------|------------------|------------|-------------------------------------|
| 4 | Guardians of the Galaxy Vol. 3 | \$358,995,815.00 | 4,450 | Walt Disney Studios Motion Pictures |
| 6 | The Little Mermaid | \$298,172,056.00 | 4,320 | Walt Disney Studios Motion Pictures |
| 7 | Ant-Man and the Wasp: Quantumania | \$214,504,909.00 | 4,345 | Walt Disney Studios Motion Pictures |
| 11 | Indiana Jones and the Dial of Destiny | \$174,480,468.00 | 4,600 | Walt Disney Studios Motion Pictures |
| 15 | Elemental | \$154,426,697.00 | 4,035 | Walt Disney Studios Motion Pictures |

- **Task #3: Sorting**

- Navigate to the worksheet P03-3. Sort the table so that it displays **Distributors** in alphabetical order. Within each **Distributor**, movies with a wider reach in the form of a greater **# Theaters** should come on top. See the figure below for a preview.

| Rank | Title | Gross | # Theaters | Distributors |
|------|--|------------------|------------|-------------------|
| 10 | Taylor Swift: The Eras Tour | \$178,243,751.00 | 3,855 | - |
| 39 | Air | \$52,460,106.00 | 3,507 | - |
| 42 | Talk to Me | \$48,299,436.00 | 2,379 | A24 |
| 9 | Sound of Freedom | \$184,174,633.00 | 3,411 | Angel Studios |
| 3 | Spider-Man: Across the Spider-Verse | \$381,311,319.00 | 4,332 | Columbia Pictures |
| 24 | The Equalizer 3 | \$92,373,751.00 | 3,965 | Columbia Pictures |
| 48 | Napoleon | \$36,211,931.00 | 3,500 | Columbia Pictures |
| 8 | John Wick: Chapter 4 | \$187,131,806.00 | 3,855 | Lions Gate Films |
| 21 | The Hunger Games: The Ballad of Songbirds & Snakes | \$103,197,294.00 | 3,776 | Lions Gate Films |

Problem #4. Conditional Formatting**(15 Points)**

Problem 4 requires you to work on two worksheets, P04-1 and P04-2, which are duplicates. The tables hold data on VTI trading over the month of November. Use the tables in these worksheets to complete the following tasks. The figures need not exactly match the given example. You MUST use conditional formatting to complete all tasks in this problem.

Task #1: Conditional Formatting Entire Rows

- Navigate to the worksheet P04-1. Apply conditional formatting to the table so that the rows of data on days where the trading Volume exceeds 3,000,000 shares are shaded green.

| Date | Ticker | Open | High | Low | Close | Volume |
|-----------|--------|----------|----------|----------|----------|-----------|
| 30-Nov-23 | VTI | \$225.73 | \$225.92 | \$224.82 | \$225.43 | 2,456,670 |
| 29-Nov-23 | VTI | \$226.38 | \$227.19 | \$225.11 | \$225.33 | 2,653,700 |
| 28-Nov-23 | VTI | \$224.77 | \$225.91 | \$224.45 | \$225.23 | 2,761,900 |
| 27-Nov-23 | VTI | \$225.12 | \$225.53 | \$224.77 | \$225.09 | 2,410,000 |
| 24-Nov-23 | VTI | \$225.04 | \$225.44 | \$225.01 | \$225.38 | 1,219,500 |
| 22-Nov-23 | VTI | \$224.85 | \$225.76 | \$224.53 | \$225.14 | 2,880,400 |
| 21-Nov-23 | VTI | \$224.25 | \$224.43 | \$223.61 | \$224.18 | 2,513,800 |
| 20-Nov-23 | VTI | \$223.11 | \$225.25 | \$223.00 | \$224.79 | 2,875,600 |
| 17-Nov-23 | VTI | \$222.87 | \$223.44 | \$222.42 | \$223.11 | 3,123,700 |
| 16-Nov-23 | VTI | \$222.30 | \$222.88 | \$221.60 | \$222.55 | 2,754,500 |
| 15-Nov-23 | VTI | \$222.86 | \$223.80 | \$222.29 | \$222.70 | 2,819,200 |
| 14-Nov-23 | VTI | \$220.51 | \$222.78 | \$220.51 | \$222.15 | 4,055,100 |

• Task #2: Data Bars and Top % Rules

- Navigate to the worksheet P04-2.
- Apply conditional formatting to the table so that data bars representing the daily trade volume are displayed to the right of the volume column, as shown in the **Red Box**.
- Apply conditional formatting to the table so that the cells displaying the top 25% of closing prices are shaded green, as shown in the **Green Box**.

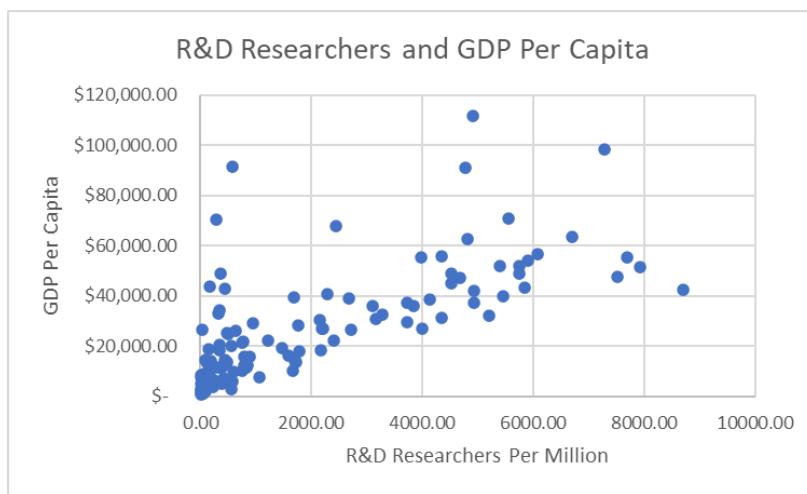
| Date | Ticker | Open | High | Low | Close | Volume |
|-----------|--------|----------|----------|----------|----------|-----------|
| 30-Nov-23 | VTI | \$225.73 | \$225.92 | \$224.82 | \$225.43 | 2,456,670 |
| 29-Nov-23 | VTI | \$226.38 | \$227.19 | \$225.11 | \$225.33 | 2,653,700 |
| 28-Nov-23 | VTI | \$224.77 | \$225.91 | \$224.45 | \$225.23 | 2,761,900 |
| 27-Nov-23 | VTI | \$225.12 | \$225.53 | \$224.77 | \$225.09 | 2,410,000 |
| 24-Nov-23 | VTI | \$225.04 | \$225.44 | \$225.01 | \$225.38 | 1,219,500 |
| 22-Nov-23 | VTI | \$224.85 | \$225.76 | \$224.53 | \$225.14 | 2,880,400 |
| 21-Nov-23 | VTI | \$224.25 | \$224.43 | \$223.61 | \$224.18 | 2,513,800 |
| 20-Nov-23 | VTI | \$223.11 | \$225.25 | \$223.00 | \$224.79 | 2,875,600 |
| 17-Nov-23 | VTI | \$222.87 | \$223.44 | \$222.42 | \$223.11 | 3,123,700 |

Problem #5. Charts**(10 Points)**

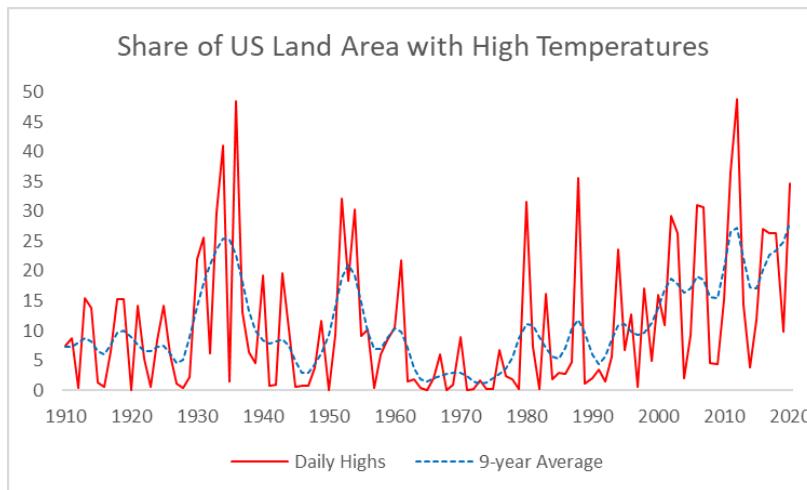
Problem 5 requires you to work on two worksheets, P05–1 and P05–2. Use the tables in these worksheets to complete the following tasks. The minute details in the figures need not exactly match the given example.

• Task #1: Chart #1

- Navigate to the worksheet P05–1. The worksheet contains data on countries' GDP per capita and the number of R&D researchers per million citizens. Using this data, replicate the following chart as closely as possible.

**• Task #2: Chart #2**

- Navigate to the worksheet P05–2. The worksheet contains data on temperature anomalies in the US over time. Using this data, replicate the following chart as closely as possible.



Problem #6. PivotTables**(15 Points)**

Navigate to worksheet P06. This worksheet contains stock market data on four different assets: VTI, GLD, BND, and VT. Use this data to complete the following tasks.

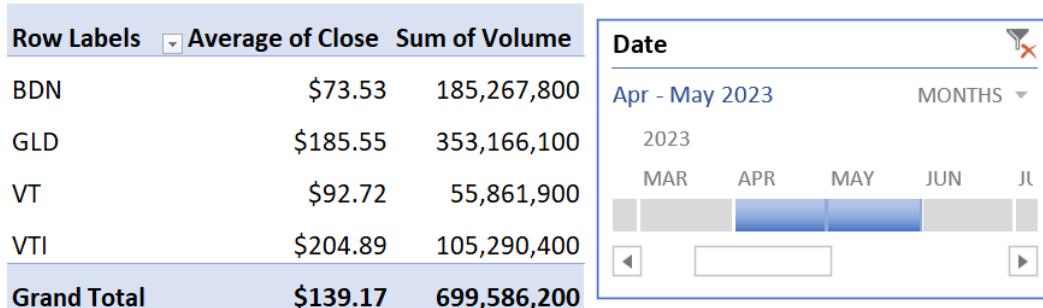
- **Task #1: Constructing PivotTables**

- Using the data, construct a PivotTable that matches the figure below.

| Row Labels | Average of Close | Sum of Volume |
|--------------------|------------------|----------------------|
| BDN | \$72.03 | 1,312,605,366 |
| GLD | \$179.75 | 1,670,986,583 |
| VT | \$93.85 | 404,314,056 |
| VTI | \$211.09 | 696,279,470 |
| Grand Total | \$139.18 | 4,084,185,475 |

- **Task #2: Slicer / Timeline**

- Add the filtering tool shown in the figure below.
- Using this tool, filter the data so that the PivotTable displays values based on the months of April 2023 and May 2023 as shown in the figure.

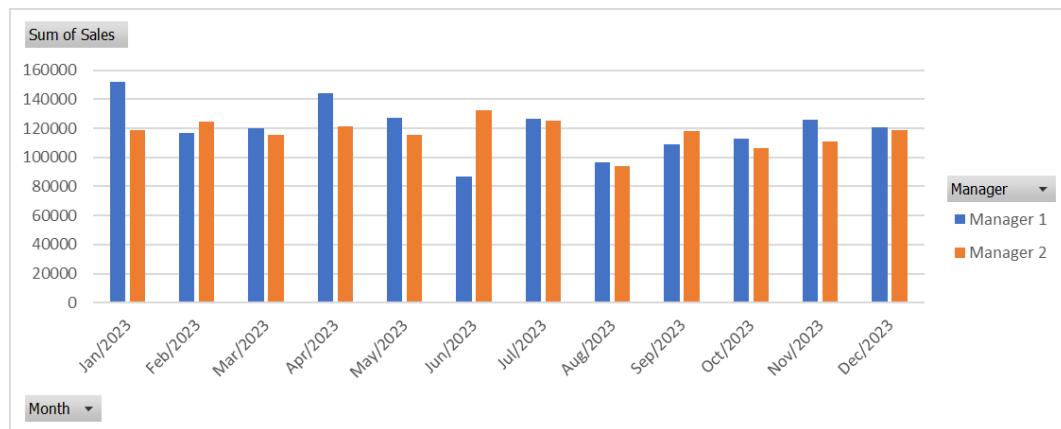


Problem #7. PivotCharts**(10 Points)**

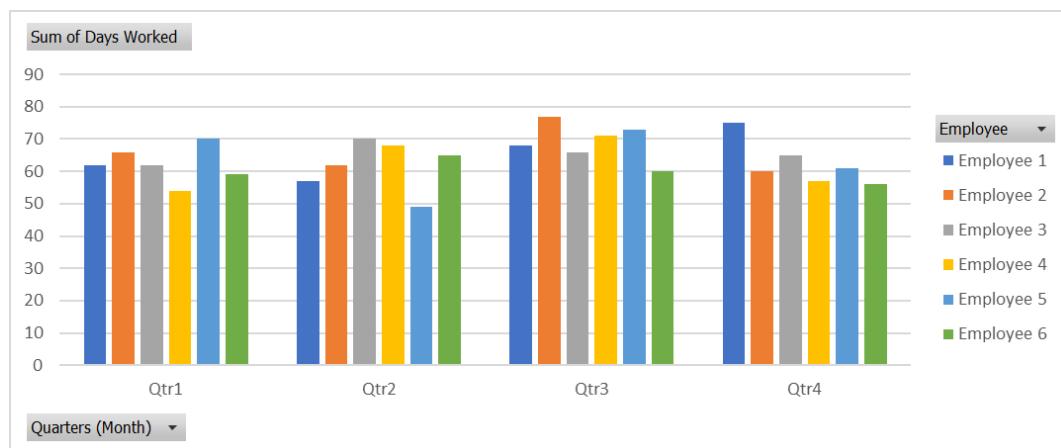
Navigate to worksheet P07. This worksheet contains sales data for 6 employees, working under two different managers. Use this data to complete the following tasks.

• Task #1: Constructing PivotCharts

- Using the data, construct a PivotChart that closely matches the figure below.

**• Task #2: Variable Manipulation in PivotCharts**

- Using the data, construct an additional PivotChart on a new worksheet that closely matches the figure below.



Problem #8. What-if Analysis**(5 Points)**

Navigate to worksheet P08. This worksheet contains a simplified calculator to calculate retirement plans. Complete the following task using this calculator.

• Task #1: How Long Does it Take?

- Assume that the individual's target retirement account value is \$2,500,000, and they can save \$1,000 monthly while collecting a 7.5% return on their investment year-on-year.
- Using the What-if Analysis toolkit and editing the entries of some cells (if necessary), calculate how many years it will take for this individual to reach this goal.

| Item | Value |
|-----------------------|---|
| Monthly Savings | \$ 800.00 |
| Return on Investments | 6.00% |
| Years to Retirement | 30 |
| Retirement Account | \$803,612.03 ← DO NOT OVERWRITE THIS CELL |