BISM7202 Information Systems for Management

Case Specification: MS Office Excel Assignment

SEMESTER 2, 2024

UrbanEats Delivery

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Specification

Workbook

This specification document is a companion document to the Assessment Guideline.

The Excel template of the expected worksheet is available on the BISM7202 Blackboard site. The Excel template provided *must* be used as the basis for the assignment.

You may change the visual formatting (correct typographical errors, change color, fonts, data format presentation, column widths, etc.) of the worksheets to provide a **professional finished product**, and will need to **define named ranges**, but **nothing else unless asked to do so**. For example, do not add or remove rows or columns.

You would be well advised to make your work of the highest presentation quality **(e.g., freeze panes to long pages, use named ranges where appropriate, use lookup functions instead of nested IFs where appropriate, use hard coding only where appropriate, use appropriate fonts and colors, graph axes and titles, etc.)**.

Note: *Entering student name and student number in the Document Control Sheet should be the first step that you do in undertaking this assignment.*

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When you develop your solution, you should use (but are not limited to) the functions and features you were taught in the tutorials. If you need functions or techniques that are not addressed explicitly in tutorial exercises, you should explore your pre-tutorial reading materials and preparation exercises or refer to the help component of Excel (or conduct a web search).

Aspects of the assignment have purposefully been designed to train and test a student's self-learning ability with a software application, and thus it is possible that not all the functions you need to use have been directly addressed in a tutorial exercise.

This assignment requires you to complete an Excel workbook file using Microsoft 365 Excel / Excel 2019 based on the specification in this document. The Excel workbook contains several sheets you should develop. These sheets are described as follows.

It is highly recommended that, prior to assignment submission, you check that your solution works on the university machines if you have developed it on your own machine.

Saving your files using the default Excel filetype (i.e., xslx) is mandatory. Files saved in other formats, e.g., xlsm, xslb, xls, calc, google sheets, etc., will not be opened.

Overview of the Case Scenario

An innovative, new company called **UrbanEats Delivery (UED)** has been established to provide a door-to-door grocery delivery service to the urban neighbourhoods of Brisbane. UED is set up as a franchise, meaning there is a 'head' franchisor with several franchisees operating under license from the franchisor. UED has five franchisees in Brisbane, each of which is a local grocery shop.

As franchisees of UED, they are licensed to deliver daily groceries in boxes to homes and businesses within their designated areas (their 'franchise territory'). Over its three years of operation, UED has developed a reliable reputation among its customer bases. UED customers receive a 'customized grocery' box each week via their membership subscription program. The length of membership varies in terms of 12, 24, or 36 weeks, and subscription fees vary accordingly.

Mr. Michael Davis, the owner of **UrbanEats Delivery (UED)**, has asked you to develop a spreadsheet that will help refine the franchise areas and minimize the distance travelled. Michael is very environmentally conscious and does not want to harm the planet while delivering groceries. He wants you to:

1. **Develop a Schedule of Employee Budgeted Salary Costs and Build a Summary Table**:
   o Create a detailed schedule of employee salaries according to the specifications.
   o Summarize the data using database functions in a summary table.
2. **Undertake a Solver Analysis on Business Franchise Areas**:
   o Use Excel's Solver tool to analyse and reallocate franchise areas to minimize the distance travelled from each store.
3. **Undertake a Scenario Analysis for Saving Monthly/Fortnightly**:
   o Analyse different scenarios for saving money either monthly or fortnightly to fund the construction of a new store. What if, estimating the required amount in a few years.
4. **Provide Business-Focused Comments**:
   o Offer insights and recommendations based on the spreadsheet analysis, focusing on the business impact and environmental benefits.

List of Sheets in Excel Workbook

When submitted, your final solution will have the following sheets:

- Document Control
- Constant
- Employees
- Payroll Summary
- *Pivot Table*
- *Pivot Chart*
- Current Franchise Distribution
- Franchise Redistribution
- *Solver Analysis Answer Report*
- *Pivot Table*
- *Pivot Chart*
- New Store Investment
- *Scenario Summary*
- Comments to Michael

Sheets highlighted in ***italics,*** need to be created by following instructions in this document, as they are not in the template file.

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Document Control Sheet

> **Hint:** *Throughout the spreadsheet, cells with a light shaded orange background require youto enter a value or a formula in them or take some actions with them.*
>
> *Cells with a light-orange background are to be populated by either the Solver or Scenario Manager tools, not you.*
>
> *Cells with no colour background should not be edited or changed by you unless explicitly directed to do so in this specification document.*

First enter your details: Student name and student number.

In addition, you should list any assumptions that you have made when you developed your assignment on this sheet. The assumptions allow examiners to understand your work in context. You should use these assumptions to resolve any ambiguities you might identify in this Case Specification.

The assumptions you make must be logical and consistent with the scenario provided in this Case Specification.

If you do not make any assumptions, please leave this section empty.

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Constant Sheet

This sheet contains all the lookup tables that you will need to use in the assignment. **When using lookup tables in your formulas from the Constant sheet, make sure they are accessed using appropriate Named Ranges.**

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You should also **edit** some tables which are empty and coloured in Orange and then **format** this sheet **professionally**.

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> **MARKS ARE ALLOCATED IN THE MARKING RUBRIC FOR USING NAMED RANGES TO REFER TO RANGES OR CELLS IN A DIFFERENT WORKSHEET**

Note: *Throughout this assignment, you must use a Named Range whenever referring toa range or a cell in writing formulas/functions to ensure that whoever reviews your spreadsheet can understand it, especially when the range or cell is from anotherworksheet. You can also use Named Ranges to refer to a range or a cell in the same worksheet, but this is optional.*

Attention: *There are 8 lookup tables or values contained in this Constant Sheet. You are to complete theseas directed below.*

Employee Salary Table

Employees are paid at different rates based on their job title. Each job comes with a different employer superannuation percentage rate and different email domain. The details of the different job descriptions are presented below. All data is fictious in the tables below.

Note: You are required to complete the data entry of the *"Employee Salary Table"* table in the workbook.

Table 1: Employee Salary Table for 2024-25

Job Title	Annual Salary	Employer Super	Department
Accountant	$ 81,500	11.5%	Finance Department
Operation Manager	$ 73,200	10%	Operation Department
Owner	$ 200,545	15.5%	Executive Management
Delivery Service Manager	$ 84,000	14%	Logistics and Delivery Department
IT Manager	$100,768	11.5%	IT Department
Franchisee Manager	$ 101,500	18%	Logistics and Delivery Department
Senior Delivery Manager	$99,963	16.5%	Logistics and Delivery Department

Annual Tax Table

Tax is withheld using the following tax rates for 2024-25.

Table 2: Australian Taxable Income Table for 2024-25

Tax slab	Taxable Income	Tax on this Income
1	$0 to $18,200	0% tax rate
2	$18,201 to $45,000	16 cents on each $ earned above $18,201
3	$45,001 to $135,000	16 cents on slab 2 + 30% on each $ earned above $45,001
4	$135,001 to $190,000	30 cents on slab 3 + 37% on each $ earned above $135,001
5	$190,001 and over	37 cents on slab 4 + 45% on each $ earned above $190,001

Note: *This information has been entered for you in the* **"Constants Sheet".**

Employee Superannuation Contribution Table

Employees at UED have collectively agreed to contribute a percentage of their annual salary to their superannuation fund **based on their age at the beginning of the financial year** as a **post-tax contribution** ('non-concessional contributions'). In Australia, a superannuation fund receives a percentage of every salary to employees to invest on their behalf so that they can draw on it when they retire.

Based on age at the beginning of the financial year, UED employees have agreed to contribute the following percentages of their annual salary to their superannuation fund:

- **Employees aged 25 and over**:

  (a) Contribution Rate: **3.0%**

- **Employees aged 35 and over**:

  (b) Contribution Rate: **6.5%**

- **Employees aged 45 and over**:

  (c) Contribution Rate: **4.0%**

- **Employees aged 55 and over**:

  (d) Contribution Rate: **4.5%**

Note: In Australia, the financial year is for the period 1 July to 30 June, which is different to calendar year (1 January to 31 December).

UED Employee Annual Christmas Bonus Structure

At the end of each calendar year, employees of UED who have demonstrated extended service with the company are awarded an annual Christmas bonus. The bonus percentages are based on the length of their employment as follows:

- **Employees with a minimum of 5 years of service as of the beginning of the calendar year** receive a **5% bonus** on their annual salary.
- **Employees with a minimum of 8 years of service as of the beginning of the calendar year** receive a **6% bonus** on their annual salary.
- **Employees with a minimum of 10 years of service as of the beginning of the calendar year** receive an **8% bonus** on their annual salary.
- **Employees with a minimum of 12 years of service as of the beginning of the calendar year** receive a **10% bonus** on their annual salary.
- **Employees with a minimum of 15 years of service as of the beginning of the calendar year** receive an **11% bonus** on their annual salary.

Note: You are required to complete the data entry for this bonus structure in the provided workbook.

Beginning of Calendar Year

Use function to enter the first day of the 2024 calendar year (i.e., 01/01/2024).

Note: You are required to complete the data entry of the table in the workbook.

Beginning of Financial Year

Use function to enter the first day of the 2024/2025 financial year (i.e., 01/07/2024).

Note: You are required to complete the data entry of the table in the workbook.

UED Subscriptions Table

The subscription fee paid by customers varies according to the number of weeks they subscribe. Customers pay $99 per week for a 12-week subscription, $70 per week for a 24-week subscription, and $40 per week for a 36-week subscription.

*Note: This information has been entered for you in the "**Constants Sheet**"*

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Distance Survey and Suburb Profile Table

Previously, franchise areas were allocated according to a rule of thumb ('whatever worked') at the time the franchise was allocated. As UED matures, Mr. Michael Davis now wants to consider allocating franchise areas based on the average actual travel distance from the shop to the suburbs that they service.

This table is central to those calculations.

Each row in this table is an inner-city suburb in Brisbane that is within 6kms or so of the Brisbane CBD. The latitude and longitude of an 'average' (centroid) point for each suburb is provided. You are to use this information to determine distance for franchise areas.

Each row also indicates the ***prospective*** subscribers to the UED service in these Brisbane suburbs to each subscription type (12, 24, or 36 weeks). This information is derived from extensive and, according to Michael, infallible, market research [1] . ***Prospective subscribers*** contain the number of potential subscribers in each suburb, as discovered through market research. The role of ***prospective*** subscribers versus ***actual*** subscribers is discussed below in the Current Franchise Distribution section.

Each column in this table represents the four (4) current franchisee stores in Brisbane (Brisbane City, South Brisbane, Milton, and Fortitude Valley).

In this table, you are to calculate the distance from each franchisee store to each suburb using the latitude and longitude. To do this, use the latitude and longitude of each location according to the following formula.

$$
\begin{aligned}
DDDstance = \ &ACOS(COS(\ RADIANS(90 - Lat1)\ ) \times COS(RADIANS(90 - Lat2)) \\
&+ SIN(RADIANS(90 - Lat1)) \\
&\times SIN(RADIANS(90 - Lat2)) \times COS(RADIANS(Long1 - Long2))) \\
&\times 6371
\end{aligned}
$$

This Haversine formula uses a widely accepted method of calculating distances across the surface of the earth (which looks quite complicated because the earth is not flat). Do not worry about the calculation method. Just insert the latitude and longitude of each suburb and each franchisee store respectively into your formula as follows.

Note: *The Shop Code at the top of this table relates each Shop Code to the suburb in which it is located.*

Hint: *You may wish to check your calculations of distance between suburbs using Google Earth to measure point-to-point distance. Google Maps would provide travel distance using roads, which would be longer than the Haversine formula (great circle method) above.*

Note: *The distance between a franchisee store in a suburb and the suburb in which it is located will be 0. For example, the distance between the suburb of Milton in the row of this matrix and the suburb of Milton in the column of this matrix should be 0. If it is not zero – then your formula is wrong!*

Note: *Format this table appropriately.*

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[1] You protest to Mr. Michael Davis that no market research is ever infallible. Mr. Michael Davis tells you 'Don't you worry about that!'

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Employees Sheet

Note: *Please note that your formulas should be efficient and not hardcoded. You can use a Lookup and Reference function to achieve this.*

When using lookup tables in your formulas for values in the Employees Sheet, make sure they are accessed using <u>appropriate named ranges</u>.

You should also format this sheet professionally and meaningfully.

The employee sheet keeps track of UED's employees. Your tasks are to:

Suggested order to complete tasks: Employee Budgeted Salary Costs -> Employee Personal Details -> Database Functions

Employee Budgeted Salary Costs

(1) **Column M**: Insert a formula to retrieve the annual salary of the employee from the Constant Sheet based on employee's Job Title.

(2) **Column N & O**: Following this, insert formulas to calculate the employer and employee superannuation contributions.

Note: *Please note that employer super contribution rates are in the salary table. The employer superannuation contribution rates must be multiplied by annual salary.*

Hint: *You will need to use the employee's birthday in relation to the first day of the financial year to calculate their employee superannuation contributions. The employee superannuation contribution is post-tax contribution. Employees younger than 30 would not pay any extra contribution.*

Look at the date and time functions to best understand how to calculate accurate durations between dates, dividing number of days by 365 is not accurate enough.

(3) **Column P:** Insert a formula to determine the Christmas bonus employees receive in addition to their annual salary.

Hint: *You will need to use the employee's first working day in this formula in relation to the beginning of Calendar Year. Look at the date and time functions.*

(4) **Column Q:** Using a formula calculate the annual income tax & Medicare levy withheld from employees based on their salary.

Note: In your solution, assume that all employees pay the Medicare levy of 2% (that is, assume all employees earn more than the threshold for low-income earners, and no Medicare Levy Surcharge applies). The taxable income should include Christmas bonus.

How to calculate: *Use the Annual Tax Table to calculate Income Tax from all income figures.* **For example:** *An employee whose salary is $81,500 who has been at the store for 5 years would receive ($81,500 + (0.05 x $81, 500)) = $85,575 in taxable income.*

On this taxable income, the accountant would pay income tax of ($4,288 + ($81,500 – 45,001) x 0.30) = $15,237.70. The Medicare Levy of 2% also applies and so Income Tax & Medicare Levy would be $15,237.70 + ($81,500 x 0.02) = $16,867.70.

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(5) **Column R:** Finally, insert a formula to determine the annual take home balance for each employee – this is each employee's total income less tax paid less any employee contributions to superannuation.

Employee Personal Details

(1) Email Address (**Column K**): Insert a formula to form out email address for each employee. All employees share the same company domain, which is "UED.com.au", butdifferent subdomains for each department.

> **Hint:** *Derive this column from 'Given Name' (Column C), 'Surname' (Column E), and 'Employee Salary Table' on the Constant sheet. You may need to look up the departmentname and then connect with the company domain. For example, the email address for employee Eleanor Greene who serves as a* **Delivery service manager** *should be.*
> *E.Greene@logisticsanddeliverydepartment.UED.com.au*

(2) Residential Suburb (**Column L**): Insert a formula to determine the employee's residential suburb (i.e., Milton).

> **Hint:** *You will need to search for the suburb name in the employee's address to determinethe suburb of their home address. Here you are allowed to explore some Text Functions which are not covered in tutorial.*

Database Functions

You then need to complete the UED Summary Table at the top of the sheet **using Database Functions**. Please use the criteria range (A2:R3) and database range (A17:R94) by assigning the named ranges "Criteria" and "Database" respectively, **apply database functions to calculate the minimum, maximum, average, and total values for the listed headings (M-R),** so that changing the criteria in row 3 results in changes to the summary table values in rows 9-12. **You should also use a database function to count the number of records in the schedule that meet the criteria for cell M7.**

> **Hint:** *Database functions begin with a "D" and rely on criteria set out in a range that you identify and populate with your criteria. You will need to apply the advanced filter function to filter out records that meet the criteria.*
>
> *The formulas should be robust to control error with IFERROR.*

When submitting the spreadsheet, **set the criteria for summary table database functions so that the Summary Table displays data relating to only the Job Title of "Delivery Service Manager".**

Payroll Summary Sheet

Payroll Summary sheet records the actual payment across 12 months for each employee in 2024 (Please note that the calculations in Employees Sheet are *budgeted take-home payment* not the *actual payment* employees received).

Using the information from the **Employees Sheet** and the **Payroll Summary Sheet**, create **Relationship** through **Power Pivot** and generate a PivotTable to compare **the budgeted take-home payment versus actual payment** based on the **Job Title**. Calculated fields in PivotTable are not required but please make sure the PivotTable has **meaningful label headers**. To make it easier for other users to view the movement of the salaries, visualise the PivotTable by inserting a Clustered Column PivotChart. The PivotChart must have a **meaningful chart title**. You should put the Pivot Table and the Pivot Chart in two separate worksheets and give each of the two worksheets a **meaningful sheet name.**

> **Hint:** *You need to import the data from* <u>Payroll Summary 2024 Sheet</u>. *Please clean the dataset before loading into the sheet, removing duplicates. PivotTable and Pivot Chart worksheets do not exist in the template. 'Job Title' should be displayed in Rows.*

> **Hint:** *You do not need to use calculated fields in the PivotTable, which means that you do no need to add columns/rows manually in PivotTable.*

Current Franchise Distribution Sheet

Currently, UED stores are assigned suburbs as their franchise area (where they have exclusive rights to provide UED services) in an ad hoc manner. Mr. Michael Davis does not like the random manner by which this allocation was made.

You are to model the Current Franchise Distribution and calculate the **'Total Number of Customers', 'Total Distance', and 'Total Subscription Revenue'** for each store using the layout in this sheet. In doing so, calculate the 'Distance', Number of *actual* subscribers by each subscription type, and 'Revenue' in this sheet for all suburbs of UED.

> **Hint:** *You will need to use some of Excel's Lookup & Reference, Math & Trig, and Logical functions in some of your formulas.*
>
> **Hint:** *You will need to use one of Excel's Logical functions to ensure a 0 value for any suburb without an assigned shop code in this table.*

Distance is the distance from each assigned franchisee store to each suburb. The current assignment of suburbs to the franchisee is indicated in the template.

Actual subscribers are different from prospective subscribers. A *prospective* subscriber is the likely **maximum** number of UED subscribers in the suburb indicated by market research. The *actual* number of subscribers is dependent on the number of prospective subscribers and their distance from the nearest store. *Prospective* subscribers are identified in the Distance Survey and Suburb Profile Table of the Constants sheet.

Actual subscribers are the number of *prospective* subscribers reduced by 10% for every 1 whole kilometer away (rounded down) from the nearest store until there are 0 actual subscribers. For example, a suburb with 62 *prospective* subscribers that is 4.8 kilometers away from the nearest store would have 38 *actual* subscribers. Mathematically, this can be represented as ($actual$

$subscr⦚bers = 62 - \lfloor 62 \times \lfloor \frac{4.8}{1} \rfloor \times 0.1 \rfloor$).

Essentially – the further away *prospective* subscribers are from the store, the fewer *actual* subscribers there will be.

Subscription Annual Revenue is the number of *actual* subscribers in each suburb according to the assigned store multiplied by the subscription rate for each subscription type (12, 24, or 36 weeks subscriptions) multiplied by the number of weeks for subscription in a year.

> **Hint:** *Although subscribers may take up the service, or may drop the service, or change subscription, you should assume that such changes cancel each other out – that is, you may assume that the number of subscribers does not change over the twelve-month period and all customers renew their subscription for the period (or those that leave are replaced by new customers). Here is a hint that you can use the FLOOR and MAX functions.*
>
> **Hint:** *To do this last requirement (row 55), you need to add column totals for each column in Current Franchise Distribution.*

You should then **complete the Summary Table of Current Customers, Distance, and Revenue by store** as indicated in the template and then sort the table by Annual Revenue (largest to smallest), then by Distance (largest to smallest), then by Customer (largest to smallest). The Revenue per Kilometre is the Total Revenue for all stores divided by Total Distance for all stores.

Franchise Redistribution Sheet

As mentioned, Mr. Michael Davis is very environmentally conscious and wants to reduce greenhouse gas emissions and increases UED's environmental credentials. Rather than the previous random arrangements, Mr. Michael Davis wants to ensure that all suburbs are serviced by the closest UED store.

You are to use the Solver analysis in this worksheet to work out a possible redistribution plan to distribute groceries from the four franchisees to all suburbs, **ensuring that the total distance of stores from the suburbs assigned to them is minimised.**

For **'variable area' in Solver analysis, use the area highlighted in light orange** on this sheet in the template. These variables are **binary (0 or 1)** and are used to assign suburbs to stores. You will need to use the **Simplex LP Solving Method**.

In this sheet, each row represents a suburb, and each column headed with a shop code (Columns B, C, D & E) represents the assigned shop (the highlighted light orange area). In the intersecting cell of the shop and the suburb, a 0 indicates that the shop is not assigned to the suburb, whereas a 1 indicates that the shop is assigned to the suburb.

The key constraints are that **each inner-city suburb should be assigned to one, and one only, store.** Further**, the variable area (the light orange cells) is either 0 or 1 (i.e., binary).** The solver should be used to assign each suburb to its nearest store. The solver solution (i.e., original values) in the template is the current franchise distribution.

> **Note:** *Please note that your formulas in this solution should be efficient. You can use a Lookup and Reference function to achieve this.*

After you fill in the **total Franchisee assigned** column, identify the **current shop code** assigned to each suburb name and identify the **newly assigned shop code** for each suburb name. Using this code, identify the New Shop Location (i.e., **the suburb** of the assigned shop) in the next column.

The Distance column shows the distance between the currently selected shop to the assigned suburb (i.e., the cell in the light orange matrix with a '1' in it). You should calculate this using an efficient formula.

> **Hint:** Consider both the 'Distance to Shop Calculation Matrix' and the Franchise Redistribution Solver solution.

> **Hint:** Remember that you used a Math & Trig function in Distance Survey and Suburb Profile Table to determine the distance from each suburb to each shop. The Distance to Shop Calculation Matrix is automatically filled once your Distance Survey and Suburb Profile Table in the Constant Sheet is completed.

Then, identify the subscriber numbers (12, 24 and 36), and total revenue based on this arrangement. **Note that these *actual* subscriber numbers are calculated according to <u>the same formula</u> outlined in the Current Franchise Distribution sheet** (i.e., *actual* subscribers are calculated based on the number of prospective subscribers and the suburb's distance from the new assigned store - the nearest store).

> **Hint:** You will need to use some of Excel's Lookup & Reference, Math & Trig, and Logical functions in some of your formulas.

Calculate the *total* figures for these columns at the bottom of the table.

To easily identify the suburbs and franchisees that require changes, use **Conditional Formatting** to highlight (background only) the 'Suburb Names' in red (Column A) for each row if the assigned store stays the same, and highlight (background only) the 'Suburb Name' in green (Column A) if the assigned store changes.

Similarly, use **Conditional Formatting** to highlight (background only) the 'New Shop Code Assigned' (Column H) cells for each row in Bright Orange if the assigned store changes.

Save the results of Solver to a new answer sheet and **restore the original values** before submitting.

Note: *It is important that you <u>restore the original values</u> after running Solver.*

Note: *Copy the original matrix values for the highlighted yellow section from the original sheet if you overwrite these values in error.*

Finally, you should complete **the summary table** of the revenue by store as indicated in the template. Identify the suburb name of each shop code using a formula, and the remainder of the summary table can be completed using Mathematical and Trig function. Do not forget to sort table by the same order as the previous sheet.

The Revenue per Kilometer figure is the Total Revenue of all stores divided by Total Distance of all stores.

Further Analysis using Pivot Table and Pivot Chart

You are to create a Pivot Table and from that you create a professionally formatted Pivot Chart using the information on the **Franchise Redistribution Sheet**. You should put the Pivot Table and the Pivot Chart in two separate worksheets.

Hint: *These worksheets do not exist in the template.*

When creating the Pivot Table, set the Suburb Name as a filter on the Pivot Table Fields so that the Pivot Chart can be modified to focus on the selected suburbs according to the viewer's wishes. The row labels of the Pivot Table should be the four actual suburbs in which stores are located, and there should be **three columns** that calculate the number of subscribers for each of the three subscription types for each store. You should also **include another column for total revenue.**

> **Hint:** *You do not need to use calculated fields in the PivotTable, which means that you do no need to add columns/rows manually in PivotTable. You should make these happen by customizing the 'PivotTable Fields' panel.*

Then you create a Pivot Chart (including the **chart title, axes titles, colours, data labels**, etc) as a **Combo Chart Type** on its own worksheet.

> **Hint:** *For the Combo Chart type, consider Line Chart & Cluster Column Chart. You should also set up a secondary axis.*

The Chart should show the <u>new shop location, the name of the suburb on *Filter*</u>, <u>the number of subscribers of each subscription types,</u> and <u>total revenue</u> to allow them to be compared.

Submit this Pivot Chart with all data shown (i.e., all shops with all suburbs assigned to them shown on the graph).

Note: *You should put the Pivot Table and the Pivot Chart in two separate worksheets and give each of the two worksheets a meaningful sheet name.*

Note: *The pivot table should be edited through either the Pivot Table Fields or PivotChart Fields in Excel.*

New Store Investment Sheet

UED is a growing business. Mr. Michael Davis is thinking to build a new franchisee store at Rocklea in responds to his thoughts on expanding their presence at the Rocklea Grocery Markets in a fewyears' time. This would allow him to acquire groceries directly and more cheaply, thus beingable to provide more benefits to the customers.

Mr. Michael Davis wants to save the same amount each term (monthly or fortnightly) for building a new store several years from now that **will** cost a certain amount of money. He investigates severalscenarios of money deposit to undertake this investment plan. The monthly / fortnightly depositwould be used <u>to cover the fix cost and variable cost</u> of building a new store **in a few years**.

You are to use the Excel Scenario Manager to create a Scenario Summary for each of the following scenarios:

- **Medium Case:** Fix cost of $ 91,000, Variable cost of $15,000, Annual interest rate for saving of 1.3%, 12 monthly deposits each year over 5 years, Period start date is from 15/02/2024.
- **Best Case:** Fix cost of $ 97,000, Variable cost of $17,500, Annual interest rate for saving of 3.1% and fortnightly (26) deposits each year over 3 years, Period start date is from 15/02/2024.
- **Likely Case:** Fix cost of $ 110,000, Variable cost of $10,000, Annual interest rate for saving of 4.7% and 12 monthly deposits each year over 6 years, Period start date is from 15/02/2024.

- **Worst Case:** Fix cost of $ 130,000, Variable cost of $13,000, Annual interest rate for saving of 5.5% and 12 monthly deposits each year over 7 years, Period start date is from 15/02/2024.

Use the Scenario Manager to include a worksheet on your Workbook that contains the Scenario Summary. This is to summaries the four different scenarios.

Note: *The cells in Column B of the Output Area are the Result Cells for the Scenario Summary.*

You should add **meaningful row labels** to the scenario summary.

> **Hint:** *This means that you need to copy the labels in the Input Area and the Output Areato the appropriate row in the Scenario Summary sheet.*

To assist with the calculation, you must complete the Deposit Schedule for all deposits identified in the scenarios.

Note: *This schedule extends from cell D5:I5 to as far as you need to go to accommodate the full deposit schedule for all scenarios considered.*

The Deposit # has been entered for you. You should **enter formulas** starting from Cell D7 to display 2, 3, 4 … for Deposit # instead of using auto fill series. You should enter formulas start from E6 to display each period start date instead of manual input.

As the scenarios vary in the number of deposits, the length of the schedule will need to be long enough to accommodate the highest number of deposits # in the scenarios.

For example:

- *Medium Case scenario has 12 monthly deposits each year over 5 years = 60 rows.*

- *Best-Case scenario has 26 payments over 3 years = 78 rows.*

- *Worst-Case scenario has 12 monthly payments each year over 7 years = 84 rows.*

The opening balance for the first deposit should be zero. The closing balance is the amount collected after the interest earned has been added to the deposit for each term. The closing balance of one deposit period is the opening balance of the next deposit period.

You should use opening balance for each deposit and term interest rate to calculate term deposit interest. Then you are required to use Excel's Financial Function, PMT, to calculate deposit for each term.

> **Hint:** *The amount of deposit for each term should be the same. You need to use Days function to get the period start date automatically.*

> **Hint:** *Your 'Deposit Schedule' should display deposit amount as positive numbers.*
>
> **Hint:** *The last cell of your schedule should be exactly equal to the total amount of cost –that is, after your last deposit the closing balance should be equal to the total amount of cost of building the new store.*

You should professionally but simply format the **Deposit Schedule**. This means that all rows of the schedule that have values in them should have borders.

Hint: *Refer to Font – 'All Borders' format.*

This means that you should **set your formulas** so that the Deposit Schedule does not display rows when payments are finalized (i.e., no more rows after the closing balance equals to zero).

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> **Hint:** *You can force rows not to display the results of functions by using the 'If' functionin your formulas to set the cell value to "" if the final deposit has been done.*

Note: *Do not provide totals for the columns of the Deposit Schedule as this information will be displayed in the Output Area.*

> **Hint:** *You are to use <u>Conditional Formatting</u> choosing one of the "Rule Type" to not show borders of cells that have no values in them.*

You will need to calculate the information in the **Output Area** using **data** entered in the Input Area **and** calculated in the Deposit Schedule.

From the **Input Area**, you can calculate the Total Amount of Cost and Number of Deposits.

From the **Deposit Schedule** you can calculate the Deposit Amount for Each Deposit, the Total Value of Deposit Made for building the new store, and Total Interest Collected Over Life of Deposits. These three items **should be calculated as positive, not negative, numbers.**

Comments to Mr. Michael Davis Sheet

In the context of our analysis on "Franchise Redistribution" and "Current Franchise Distribution," we need to delve deeper into how predictive analytics can be effectively utilized to enhance business decisions. The following questions have been designed to guide the owner understanding and application of predictive business analytics. Your responses should reflect a comprehensive grasp of the theoretical and practical aspects of predictive models, their weaknesses, and their impact on business metrics. Additionally, consider the implications of your analyses on the operational and strategic decisions of UED.

Please provide detailed and insightful answers to the questions below, incorporating relevant examples and justifications where necessary.

Q1. Predictive Accuracy Weakness:

- Considering the results of your analysis in the Current Franchise Distribution Sheet and the Franchise Redistribution Sheet, identify and discuss a single weakness of the Excel Model that could affect the predictive accuracy of the proposed redistribution plan. Why do you think this could be a weakness, how might it impact the business decisions, and what recommendations would you give to solve it?

  Hint to consider: Think about assumptions made in the model, data limitations, or external factors not considered in the current analysis.

Q2. Alternative Business Metrics:

- In the Current Franchise Distribution and the Franchise Redistribution sheets, you calculated a 'Revenue Per Kilometre' figure. This is a business metric that can reflect UED's performance. Please identify another three-business metrics that could be used to predict UED's growth or decline. Explain why these metrics are important.

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Hint to consider: *Consider metrics like Customer Lifetime Value (CLV), Churn Rate, and Market Penetration Rate. Explain how each of these can provide insights into business performance and future trends.*

Q3. Utilizing Predictive Analytics:

- Mr. Michael Davis wants to understand how Predictive Business Analytics can enhance decision-making for UED. Explain to Mr. Michael Davis how predictive models could be utilized to forecast future customer demand, optimize delivery routes, and improve subscription rates. (***Predictive Business Analytics is the use of statistics and modelling techniques to determine future performance based on current and historical data. It can be used to improve Business Performance with Forward-Looking Measures***).

  Hint to consider: *Discuss the use of historical data for forecasting, the role of machine learning in predictive analytics, and how optimizing operational processes can lead to better business outcomes.*

*Note: You can answer each question, using bullet points or professional 4 to 6 lines citing the reasons for each question in the text box given in the answer template "**Comments to Michael**".*
Your word count for each question should not exceed 150 words.
Total word count for all 3 questions should be 450 words (10% +/- is acceptable).

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