**second Question**

i) To answer the first part of Question 2, I'll provide auto checks for the modelling completed in Question 1 parts (i) to (viii). Here are some suggestions:

(i) Data checks:

- Check for missing or invalid data points, such as blank cells or non-numeric values.

- Verify that the data falls within a reasonable range based on the context.

- Ensure the data is in the correct format (e.g., numbers, dates, etc.).

(ii) Day of the week and pick-up hour charts:

- Validate that the total number of pick-ups in the charts matches the total number of records in the dataset.

- Check that each day of the week and hour of the day is represented in the charts.

(iii) Distance and journey duration chart:

- Confirm that the chart displays a positive correlation between distance and journey duration.

- Verify that there are no extreme outliers that could distort the relationship.

(iv) Expected fare amount using fare formula (1):

- Manually calculate the expected fare for a sample of records using the provided fare formula and compare the results with the model's output.

- Ensure that the calculated fares are non-negative and reasonable based on the distance and duration.

(v) Hypothesis test for fare formula:

- Check that the hypothesis test is set up correctly (null and alternative hypotheses, test statistic, significance level).

- Verify that the conclusion drawn from the test is consistent with the test results and the chosen confidence level.

(vi) Expected fare after proposed increase (2):

- Manually calculate the expected fare for a sample of records using the proposed increase and compare the results with the model's output.

- Confirm that the increased fares are consistently higher than the original fares.

(vii) Impact of fare increase on total number of journeys in neighborhood A:

- Validate that the total number of journeys in neighborhood A before and after the fare increase is calculated correctly.

- Check that the percentage change in the number of journeys is reasonable and consistent with the fare increase.

(viii) Additional adjustment R to reduce journeys in neighborhood A to 80%:

- Verify that the calculated adjustment factor R, when applied to the fare increase, results in a number of journeys in neighborhood A that is approximately 80% of the original number.

- Ensure that the adjustment factor is reasonable and does not result in negative fares.

These auto checks should help ensure the accuracy and consistency of the modelling completed in Question 1. If any discrepancies or errors are found, investigate and correct them accordingly.

**II) Second Part**

For the second part of question 2, which focuses on demonstrating good modelling technique and practice, here are some key points to consider:

1. Structuring the model:

- Use clear and logical sheet names, such as "Input," "Calculations," and "Output."

- Separate inputs, calculations, and outputs to improve clarity and maintainability.

- Use consistent formatting, such as colors and fonts, to differentiate between different types of cells (e.g., inputs, calculations, outputs).

2. Inputs and assumptions:

- Clearly label all input cells and provide descriptions or comments where necessary.

- Group related inputs together and use appropriate headers.

- Consider using drop-down lists or data validation to restrict inputs to valid ranges or options.

3. Calculations:

- Use clear and concise formulas that are easy to understand.

- Break down complex calculations into smaller, more manageable steps.

- Use named ranges or cell references instead of hard-coded values in formulas.

- Avoid nested or overly complicated formulas whenever possible.

- Provide comments or descriptions for key calculations to improve understandability.

4. Outputs:

- Clearly label all output cells and provide descriptions or comments where necessary.

- Use appropriate formatting, such as number formats, to present the results clearly.

- Consider using charts or graphs to visualize the results and make them easier to interpret.

5. Error handling and data validation:

- Implement data validation checks to ensure that inputs are within acceptable ranges and formats.

- Use error handling techniques, such as IFERROR or IF statements, to handle potential errors gracefully.

- Provide clear error messages or warnings to guide users in correcting any issues.

6. Documentation and instructions:

- Include a "README" or "Instructions" sheet that provides an overview of the model's purpose, inputs, outputs, and key assumptions.

- Provide step-by-step instructions on how to use the model, including any specific requirements or limitations.

- Document any external data sources or references used in the model.

7. Model testing and validation:

- Test the model thoroughly with different input scenarios to ensure that it produces accurate and reliable results.

- Validate the model's outputs against known or expected values to confirm its correctness.

- Perform sensitivity analysis to understand how changes in key inputs affect the model's results.

8. Version control and backups:

- Use a version control system, such as Git or SharePoint, to track changes and collaborate with others.

- Regularly save and back up the model to prevent data loss.

9. Aesthetics and professionalism:

- Ensure that the model looks professional and visually appealing.

- Use consistent formatting, such as font sizes, colors, and styles, throughout the model.

- Remove any unnecessary sheets, rows, or columns to keep the model clean and focused.

By following these modelling techniques and practices, you can create a well-structured, maintainable, and user-friendly model that effectively communicates your analysis and insights. Remember to tailor these principles to your specific model and the requirements of the project.