# Process Models & Design Thinking: Check for Understanding

**TOTAL POINTS 3**

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1.  **Using the Café Sherlock example: How do you ensure new games drive revenue?**     **1 / 1 point**

    Take the time to write down 2 ways you could validate the core business question into a testable hypothesis.

    > 1. flagName = False
    > while not flagName:
    > if [Do check here]:
    > flagName = True
    > else:
    > print('New Games Do Drive Revenue')

    ✓ **Correct**

    There are numerous correct answers and if you came up with something similar to the following your are on the right track. Because *customer frequency and duration* are essentially proxies for revenue and because the relationship between these data and the game is *direct* we ask our questions with this in mind rather than revenue directly. Asking in terms of revenue directly is not wrong in this case, but a positive correlation is harder to interpret due to likely presence of [confounding factors](confounding factors)

    -   **Which games are most associated with sales?**

    -   **Is my new game a stronger predictor of frequency and duration than other games?**

    -   **Is my new game more strongly correlated with frequency and duration than other games?**

    -   **In a predictive model does my new game have a stronger feature importance then other games?**

2.  If you were to munge the data into a **pandas.DataFrame** which of the following would describe a reasonable goal for the cleaning process?     **1 / 1 point**

    -   ⦿ **customer** on the rows and items like **total_sales**, **name**, **most_bought** on the columns

    -   ◯ **daily revenue** on the rows items like **customer_name** and **total** on the columns

    -   ◯ **transactions** on the rows and items like **customer_name** and **item_id** on the columns

    -   ◯ None of the above

3. Our model performed very well (see below), possibly because Dr. Holmes and Dr. Watson are described in very different ways in the stories, but it could be something else.

```
1                      precision    recall   f1-score    support
2
3          sherlock       0.96       1.00      0.98        150
4            watson       1.00       0.83      0.91         36
5
6          accuracy                            0.97        186
7         macro avg       0.98       0.92      0.94        186
8      weighted avg       0.97       0.97      0.97        186
```

These results are not directly related to revenue, but for the sake of the example lets assume you needed a decent version of this model to craft a new game.

**Take a minute to think about how you would interpret these results?**

These results describe the precision, recall, and accuracy. Therefore, we can trust the result base on the accuracy.

✓ **Correct**

In the above results output the **support** is the number of occurrences of each class in **y_true**. It follows that we have relatively unbalanced classes and we made no special accommodation for this situation. It is a major purpose of this stage to be critical and reflect on the process, the finding all the while keeping in mind the central business question.

Knowing that our classes are in-balanced we need to be careful about using accuracy as a metric. We will do a deeper dive into both in-balanced classes and evaluation metrics in this course. Give a sentence we do a better job predicting a **sherlock** context than a **watson** one. This is where we want to be critical and start asking questions like:

- **My game in production will likely see many different sentences. Would a negative class improve my model?**

- **I need to compare this game to the others and relate it to revenue how do I accomplish this?**

- **Is developing a new game even worth the effort or is there another way to use DS to help my friend?**