**CRISP-ML(Q) 1a.Business Understanding**

**Instructions:**

Please share your answers filled in-line in the Word document. Submit code separately wherever applicable.

Please ensure you update all the details:

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_ Batch ID:** \_\_\_\_\_\_\_\_\_\_\_

**Topic: Business Understanding**

**Instructions:** Learn to understand the problem statement and frame business objective(s) and constraint(s). You should try and use data optimization terminologies “maximize” and/or “minimize” for objective(s) and constraint(s) (for example: “maximize profit” “minimize risk”, etc.)

**Hint:**

* Objective(s) implies the goals to be achieved in terms of maximizing & minimizing.
* Constraint(s) are the challenges/limitations in achieving the objectives.

Q. For the below-listed business problems, draft the business objectives and constraints.

| **S.no** | **Business Problem** |
| --- | --- |
| **Hint:** | Smart data platforms can bring together customer transaction data and data from real-time communication streams to disclose insights concerning customers’ feelings about the services which allows for addressing satisfaction-related issues and churn prevention.  **Sol: Hint**  **Business Objective:**  **Minimize:** Churn rate  **Explanation**: (churning implies customers going to another company for their needs)  (or)  **Maximize:** Customer satisfaction (satisfaction will make customers more loyal to the brand)  **Business Constraints:** Lack of data coverage for all customers |
| 1 | Advanced targeting allows predicting needs, preferences, and customers’ reactions to the telecommunication services and products on offer by segmenting their market and targeting the content according to each group.  **Business Objective:**  **Maximize**: Customer segmentation  **Explanation**: (The key to success for the telecommunication companies is to segment their market and target the content according to each group.)  **Business Constraints:** Cost (Segmentation of market may lead to higher cost.) |
| 2 | Collection of positive & negative reactions to the service or product from social media sources, and recent trends via customer sentiment analysis may provide an opportunity to utilize mechanisms for direct responding.  **Business Objective:**  **Minimize:** Waiting time for customers  **Explanation:** (sentiment analysis automates the jobs, route customer tickets to the correct teams and deal with them as swiftly as possible.)  **Maximize:** Profits  **Explanation:**(customer sentiment analysis can improve your customer satisfaction index, customer loyalty, and customer lifetime value multiple folds, and thus maximize the profits for your business.)  **Business Constraints:** **Analysis may not be able to detect:**   * **Sarcasm**: Sarcasm is when people express their negative sentiments using positive words. This fact allows sarcasm to easily cheat sentiment analysis models * **Negation**: In linguistics, negation is a way of reversing the polarity of words, phrases, and even sentences. It’s also important to determine the range of the words that are affected by negation words. * **Word ambiguity**: The problem of word ambiguity is the impossibility to define polarity in advance because the polarity for some words is strongly dependent on the sentence context. * **Multipolarity**: Sometimes, a text we would like to analyze—will exhibit multipolarity. In these cases, having only the total result of the analysis can be misleading |
| 3 | Customers usually search for better & cheaper services so telecommunication companies measure, manage, and predict the customer lifetime value (CLV). Smart solutions process real-time insights based on customer purchasing behavior, activity, services utilized, and average customer value.  **Business Objective:**  **Maximize**: Retention of customers having high CLV to increase the profitability of the firm.  **Business Constraints:**   * Calculation of CLV (If wrongly calculated it may result in loss.) * Human behavior (Retention of a customer also depends on his satisfaction level. A high value customer may leave the services if he gets dissatisfied.) |
| 4 | The retail industry uses AI systems with built-in machine-learning algorithms to collect and analyze data regarding products, transactions, etc. Based on findings from data, systems estimate the best strategies that can be implemented for the profit of the business  **Business Objective:**  **Maximize:** Business profits.  **Business Constraints:**   * **Lack of knowledge**: Knowledge of the systems is required for smooth functioning of the system. * **Cost**: Increased cost will be incurred at the initial stage for installation and operation of the system. * **Bureaucracy:** Due to high initial incurred costs many companies opt out. |
| 5 | The price determination process depends not only on the costs to produce an item but also on a typical customer’s wallet and the competitors' offers. The tools for data analysis bring this issue to a new level of its approach.  **Business Objective:**  **Maximize:** Price optimization  **Business Constraints:**   * **Time and effort**: Customer research needed to figure out the right valuations takes time and effort. * **Attitude of the business organization:** Companies turn to strategies like guessing, relying on discounts, and not relying on Value based pricing. |
| 6 | Inventory deals with stocking goods for their future use. Inventory management refers to stocking goods to use in times of crisis. The retailers aim to provide the right product at the right time and in the proper condition.  **Business Objective:**  **Minimize:** Holding, replacement and shortage costs of inventories  **Maximize:** Efficiency in production and distribution ofinventory, so that we can fulfill customer demand.  **Business Constraints:**  ● **Tracking**: Using manual inventory tracking procedures across different software and spreadsheets is time-consuming, redundant and vulnerable to errors  ● **Warehouse efficiency**: Inventory management at the warehouse is to be performed on all the tasks like receiving and putaway, picking, packing and shipping in the most efficient way possible.  ● **Inaccurate data**: Data updating is needed to be done at regular intervals to keep track of available inventory.  ● **Managing Warehouse Space**: Efficiently managing space is a very important task. It increases efficiency. |
| 7 | As flight delays depend on many factors, an intelligent system can be applied to analyze huge datasets in real-time to predict delays and re-book customers’ flights in time.  **Business Objective:**  **Maximize**: Customer satisfaction and incomes of airline agencies.  **Business Constraints:**  ● Weather and Natural Disaster  ● Emergency problems  ● Acts of terrorism |
| 8 | Understanding people and why they decide to stay at or leave a job is arguably one of the most important questions for HR to answer. Identifying attrition risk calls for advanced pattern recognition in surveying an array of variables.  **Business Objective:**  **Minimize:** Employee attrition.  **Business Constraints:**  ● **Salary**: Major cause of attrition.  ● **Workplace environment**: A good environment is required for employee growth.  ●  **Job opportunities**: Ample job opportunities mean that employees may defect. |
| 9 | In modern manufacturing, production can often depend on a few critical machines or cells. The same data that provides a manufacturer with real-time monitoring can be analyzed through data science to improve asset management and prevent machine failure.  **Business Objective:**  **Minimize:** Loss caused due to machine breakdown.  **Business Constraints:**  ● **Monitoring**: Proper monitoring is needed for fault prediction  ● **Complex processes**: Many processes are very complex and require further knowledge.  ● **Resources**: It requires expenditure of resources for finding solutions. |
| 10 | The world is constantly changing. Thus, the sports industry is faced with the challenge of trying to predict the next trend, the next big idea that will capture its audience. Coupling this challenge with that of technology, it’s clear that some sports teams and venues will always be at odds.  **Business Objective:**  **Maximize:** Good predictions of the future based on historical data and present data.  **Business Constraints:**  ● **Volume**: Working with low volume data doesn’t produce accurate results  ● **Statistics**: Use proper assumptions and statistics to calculate outcomes.  ● **Model**: Use of linear models on non linear interaction. |