Math Assignment Unit 1

University of the people

MATH 1302-01 Discrete Mathematics

Instructor: Trushitkumar Patel

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PART 1:

As stated in the first question, A is the set of people who got jobs in the IT sector and B is the set of people who got jobs.

Based on that, I will answer the following:

a. A ∩ B:

This denotes the overlap of sets A and B, indicating elements shared by both A and B. In this context, it refers to individuals who secured employment both in the IT sector and in general. Thus, those within $A \cap B$ are the ones who effectively obtain jobs in the IT sector.

b. A ∪ B:

This set comprises individuals belonging to either A or B, or both. It implies they secured either IT jobs, any job, or both. Essentially, it indicates they secured any job.

c. A – B:

This set comprises individuals who belong to A but not to B. In other words, they secured IT jobs but not any other type of job. However, this scenario is impossible, as securing an IT job inherently entails securing a job.

d. B – A:

Like the previous portion, this describes the opposite, representing the disparity between set B and set A. Consequently, the set will encompass all elements in B but not in A, signifying individuals who secured jobs in general but did not secure jobs in the IT sector.

PART 2:

As indicated in the second question, A is the set of people living in the USA and B is the set of people having a house in Canada.

Based on that, I will answer the following:

a. **The set of people living in the USA and having a house in Canada** is represented by the intersection of sets A and B. This representation, denoted as A ∩ B, encapsulates solely those individuals who belong to both sets A and B, meaning they live in the USA and own a house in Canada concurrently.

b. **The set of people living in the USA who are not having a house in Canada** can be expressed by the set difference between set A and set B. This is denoted as A - B, indicating it encompasses only those individuals who reside in the USA but do not possess a house in Canada.

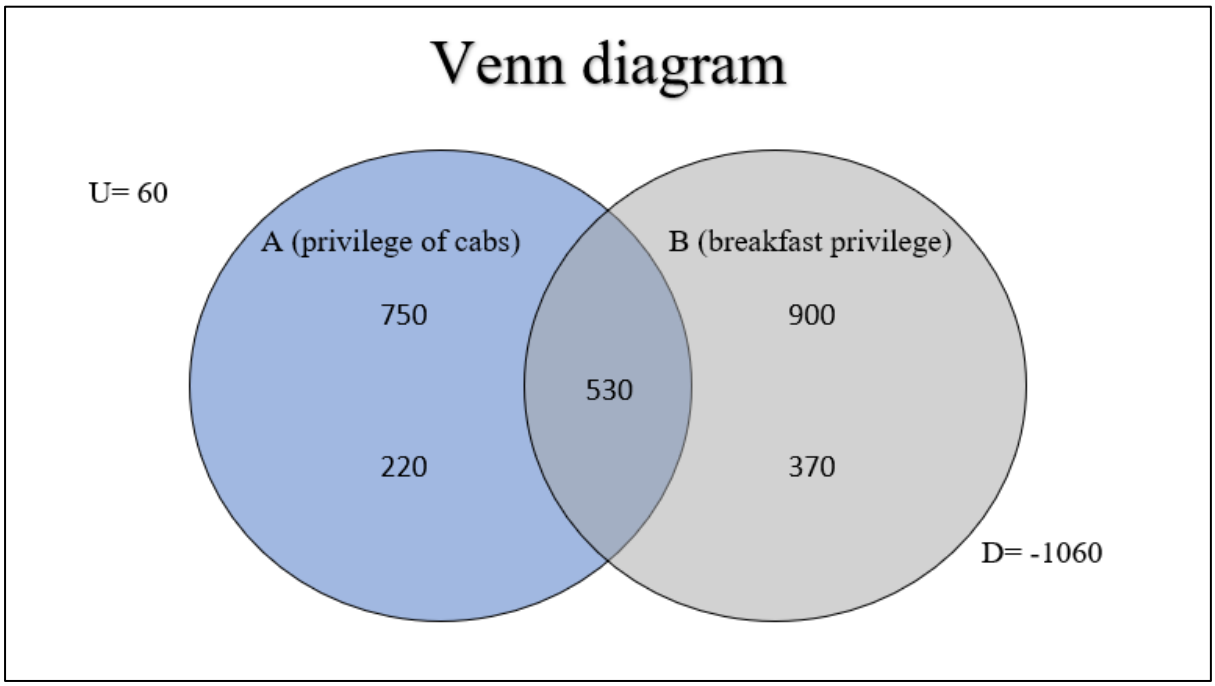
c. **The set of people who either live in the USA or have a house in Canada** can indeed be represented by the union of sets A and B, which is denoted as A ∪ B. This union includes all individuals who belong to either set A or set B, or both, covering both those who reside in the USA and those who own a house in Canada.

d. **The set of people who are either non-US residents or do not own a house in Canada** can be expressed by taking the complement of the intersection of sets A and B, denoted as (A ∩ B)'. This complement represents all elements that are not in the intersection of sets A and B, covering individuals who are not both living in the USA and having a house in Canada.

PART 3:

An IT company offered two benefits for the employees. 750 of the employees take the privilege of cabs. 900 of them take breakfast privilege. If 530 employees take both benefits, how many employees work in the company if there are 60 employees who do not take any benefits? Which concept do you use to calculate the number of employees in the company? You can either use a Venn diagram or you can use the principle of inclusion and exclusion.

I will use **Venn diagram**:



(Venn Diagram Calculator, n.d.)

To determine the overall number of employees, we sum the figures within each section of the diagram:

220 + 530 + 370 + 60 = 1180

References :

Doerr, A., & Levasseur, K. (n.d.). *ADS More on Sets. In discretemath*.org. Retrieved from https://discretemath.org/ads/chapter_4.html

Venn Diagram Calculator. (n.d.). *Calculator-Online.net*. Retrieved from https://calculator-online.net/venn-diagram-calculator/

GitMind - EN. (2020, November 11). *How to draw a Venn diagram?* [Video]. YouTube. https://www.youtube.com/watch?v=MjhJfJJEUgE