Practicum Examples:

FrameID	Color	Weight_grams	Material	Height	Width	Border_Length
100	Maple	456	Wood	10	5	30
101	Gold	1200	Steel	15	20	70
102	Walnut	907	Fiberglass	10	5	30
103	Green Stain	3215	Wood	10	5	30
104	Gold	10235	Copper	120	12	264
105	Oak	324	Wood	20	6	52

a. Use the relation above (it is in at least 1NF) to determine ALL functional dependencies that the data suggests MAY be present. Use A→B notation. To be very clear, identify all minimal (atomic) functional dependencies that have data that suggest this functional dependency may exist <u>even if you think the functional dependency would fail a logical test</u>. You have more blank spaces below than you need. Fill in how ever many you find. Note any assumptions.

FrameID → ALL OTHERS | Height → Width, Border

Weight_grams → ALL OTHERS | Width → Height, Border

Height, Width → Border_Length | →

→ | →

b. (7 pts.) Would any of these functional dependencies cause you to be the surprised if it was not removed as a functional dependency when it is eventually tested logically? If you have more than one then choose the one that would surprise you the most. Why or why not?

Weight_grams → ALL

The Height → Width, Border and Width → Height, Border are also examples

<u>Why? Or why not?</u>

Measurements (especially on continuous scales) are rarely logical determinants

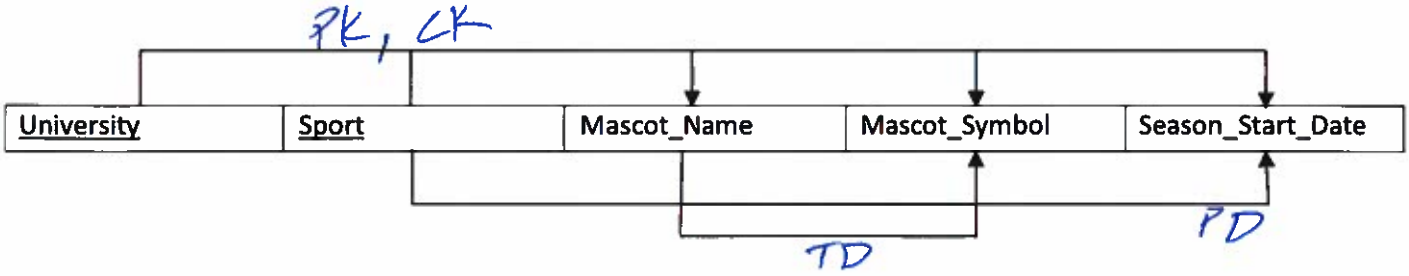
c. (6 pts.) Which attribute could be eliminated without losing any real content because it seems to be a type of redundancy? Briefly explain.

Border_Length seems to be based on an equation.

$2 \cdot (H + W) = Border\_Length$

d. (12 pts.) Use the attributes and dependency diagram below to losslessly normalize this table. Put this relation into 2NF and then into 3NF showing each normal form. The table is currently in at least 1NF.

SCHOOL_SPORT_MASCOT



2NF: Remove PD

School_Sport_Mascot (University Sport Mascot_Name Mascot_Symbol)

SeasonStart (Sport, Season_Start_Date)

TD

3NF: Remove TD

School_Sport_Mascot (University Sport Mascot_Name)

SeasonStart (Sport, Season_Start_Date)

Mascot (Mascot_Name, Mascot_Symbol)

Is this also in BCNF?

Yes. All remaining determinants in the decomposed set of relations are primary keys and therefore both candidate keys and superkeys.

∴ Every determinant is a candidate key

∴ BCNF