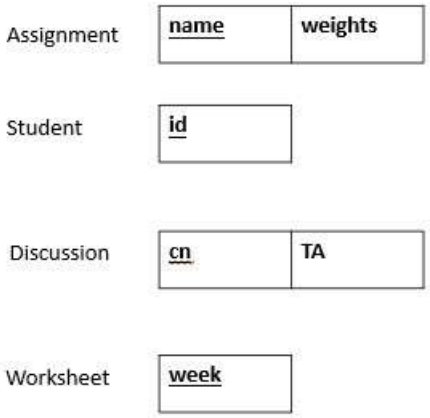
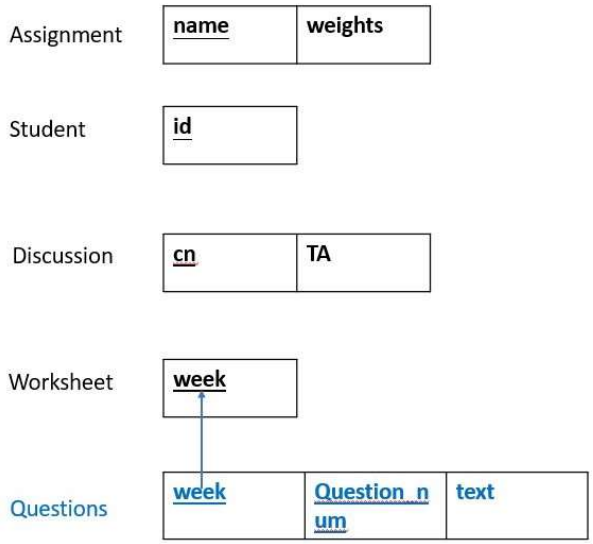
CS3402 Practice 2:

1. **Answer**:

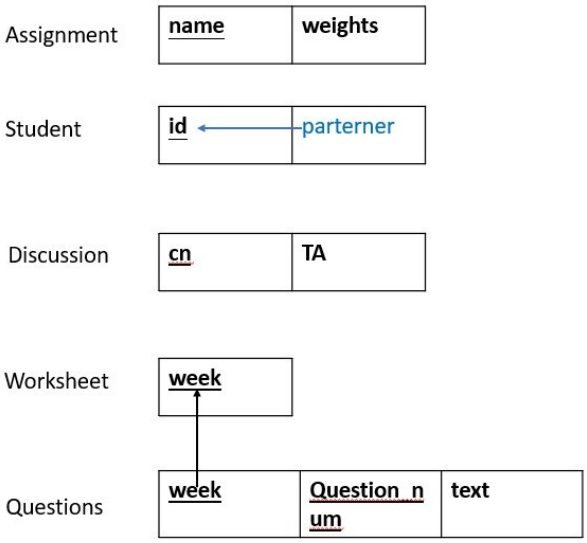
   (a) Map *strong entity* type into relation
   - Include simple (or atomic) attributes of the entity
   - Include components of composite attributes
   - Identify the primary key from the attributes
   - Don't include: non-simple component of composite attributes, derived attributes, multi-valued attributes (not yet)



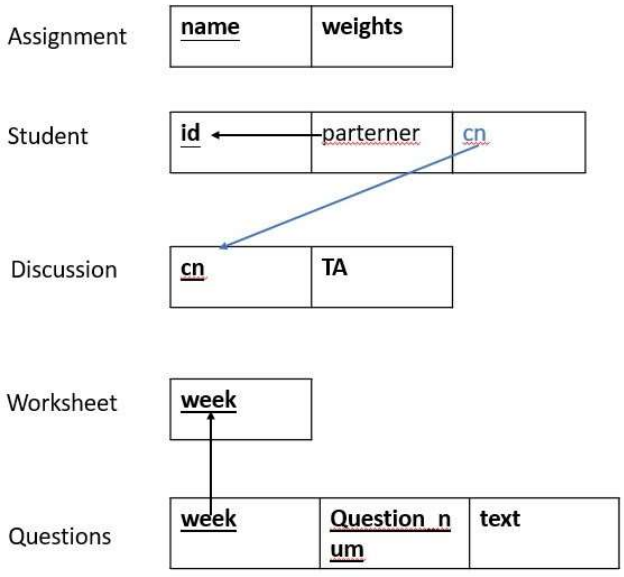
   (b) Map *weak entity* + *identifying relationship* type into relation
   - Include simple (or atomic) attributes
   - Add the associated strong entity's primary key as attributes (also known as *foreign key* because it refers to another relation's primary key)
   - Set the primary key as the combination of the *foreign* key and the partial key of the weak entity



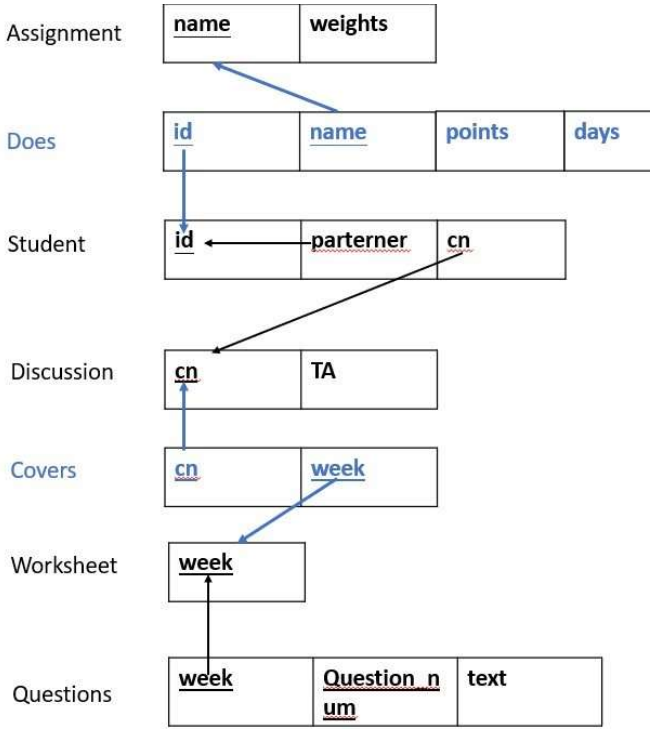
(c) Map binary *1:1 relationship* types into attributes
- Include the primary keys of one entity type as attributes (foreign keys) of the other entity type (*note:* it is better to choose the entity in total participation to include the other entity's key as attribute)
- Include also the simple attributes of the relationship type



(d) Map binary *1:N Relationship* types into attributes
- In the relation representing the *N-side* entity type, add the primary keys of the *1-side* entity type as attributes (foreign key)
- Include also the simple attributes of the relationship type



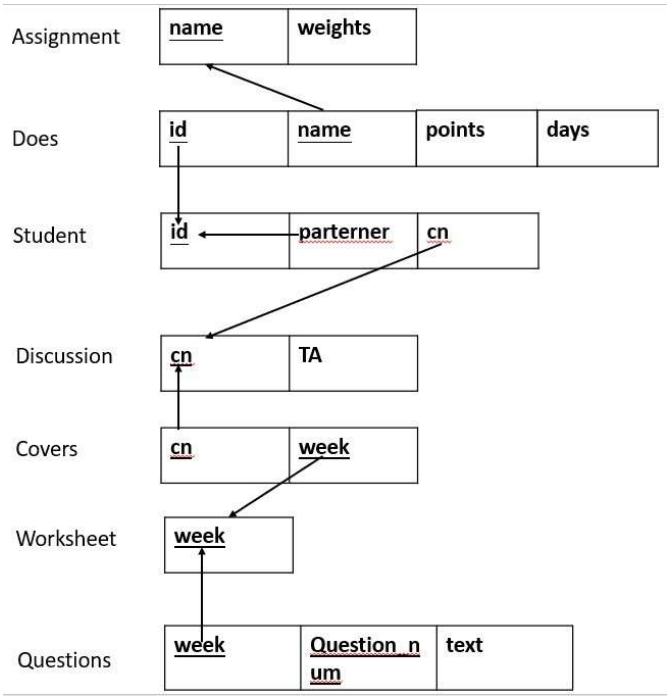
(e) Map binary *M:N relationship* type into relation
- Include the primary keys of the participating entity types as attributes (foreign key)
- Identify the primary key as the combination of the above foreign keys
- Include the simple attributes of the relationship type



(f) Map *N-ary* relationship type into relation
- Similar to binary *M:N* relationship type

(g) Map m*ulti-valued* attribute into relation
- Include the given attribute
- Include the primary attributes of the entity/relationship type owning the multivalued attribute
- Set the primary key to be the combination of foreign key and its original attribute

To summarize, the ER model will be translated into the following relational tables:



2 Answer:

2.1

ER Model (X:Y)	Relational Schema
M:N	A(a) B(b) rel(a,b)
1:N	A(a) B(b,a)
N:1	A(a,b) B(b)
1:1	A(a) B(b,a) or A(a,b) B(b)

2.2
√ (a1, b1)
√ (a1, b2)
√ (a2, b1)
√ (a2, b2)

2.3 How about the 1:N case?
√ (a1, b1)
√ (a1, b2)
(a2, b1)
(a2, b2)

OR
(a1, b1)
(a1, b2)
√ (a2, b1)
√ (a2, b2)

OR

√ (a1, b1)
(a1, b2)
(a2, b1)
√ (a2, b2)

OR

(a1, b1)
√ (a1, b2)
√ (a2, b1)
(a2, b2)

2.4 How about the 1:1 case?
√ (a1, b1)
(a1, b2)
(a2, b1)
√ (a2, b2)

OR

(a1, b1)
√ (a1, b2)
√ (a2, b1)
(a2, b2)