ASSIGNMENT - 4

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Section: 05

Ans. to Q.No - 1

1) A → BCD

Status: Invalid

Reason: For A = 1, B has two different values.

2) AB → C

Status: Valid

Reason: ~~For B = 2, 3 has 2 different values.~~

For every unique pair value of (A, B), there is a unique value of C.

3) AB → D

Status: Valid

Reason: For every unique pair value of (A, B), there's a unique value of D.

4) $D \rightarrow ABC$

Status: Valid

Reason: for every unique value of D, there's unique value of (A, B, C).

5) $BC \rightarrow A$

Status: Invalid

Reason: for the pair (B = 22, C = 0), there are 2 different values of A.

Ans. to Q.No - 2

(1) The candidate keys are BC.

Because, $BC \rightarrow E$, $E \rightarrow A$

$\therefore BC \rightarrow EA$

Again, $B \rightarrow D$, So, $BC \rightarrow ADE$.

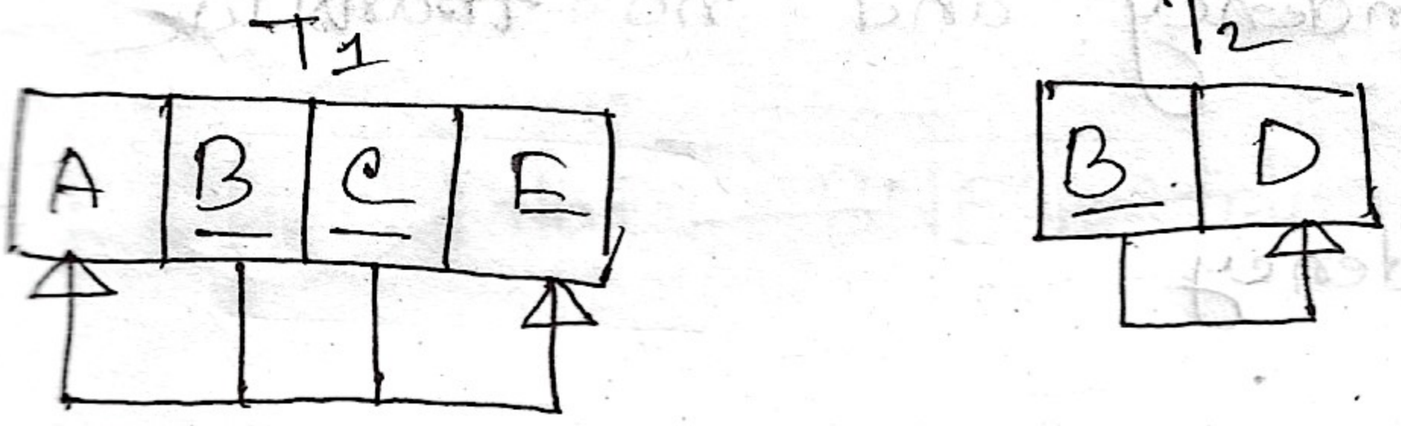
(2) Here we can find partial dependency because $B \rightarrow D$ holds. So, we do not need BC to identify D.

(3) This relation satisfies 1NF form because there are no composite/multivalue attributes and nested relations.

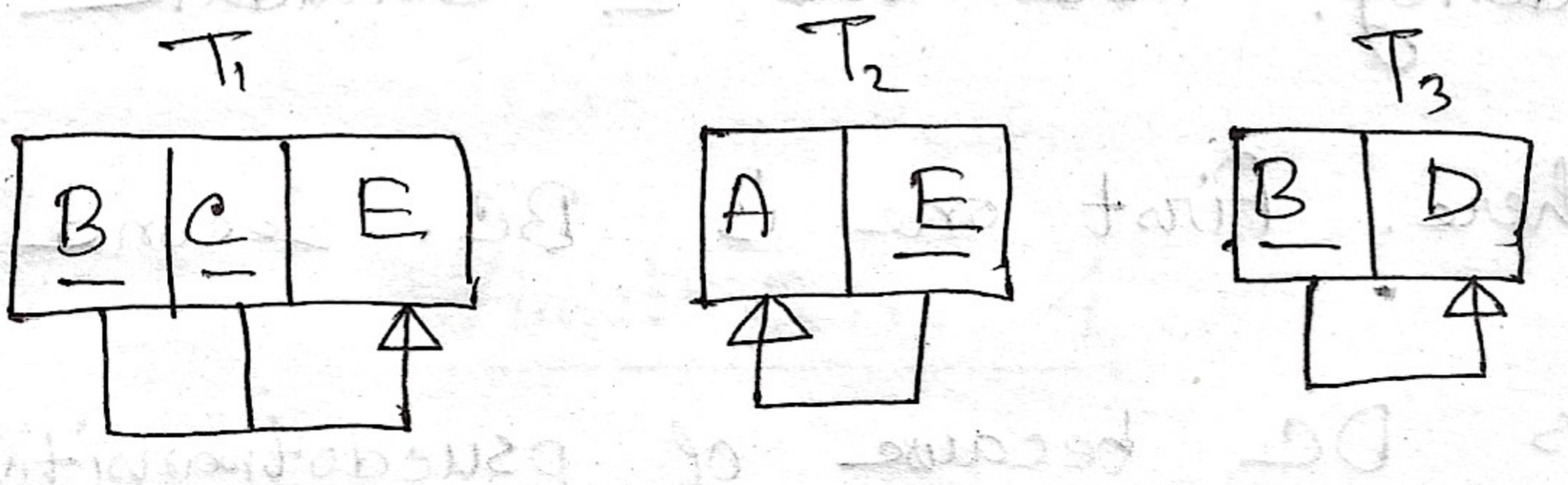
Again, it doesn't satisfy 2NF form because of it's partial dependence.

④ It is not even in 2NF form. So, it can not be in ~~3~~ 3NF form.

2NF Normalization:



3NF Normalization:



Ans. to Q No - 3

(1) This relation satisfies the 3NF form because there are no partial functional dependency and no transitive functional dependency.

(2) This relation doesn't violate any dependency. There are 2 candidate keys here. First one is BC. Second one is DC because of psuedotransitivity rule.

So we can say,

BC → ADE

or, DC → ABE

Since, (B, D, C) all are prime attributes, it doesn't violate any kind of dependency.

Because of $D \rightarrow B$, this relation "would" ~~break~~ violate 3NF's transitivity rule, but it 'doesn't' as B is already a primary attribute.

Ans.to Q No - 4

(1) Given, R(A, B, C, D, E, F)

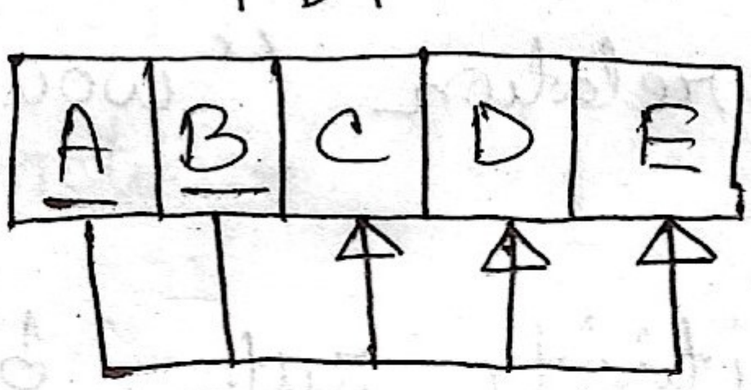
$AB \rightarrow CDE$

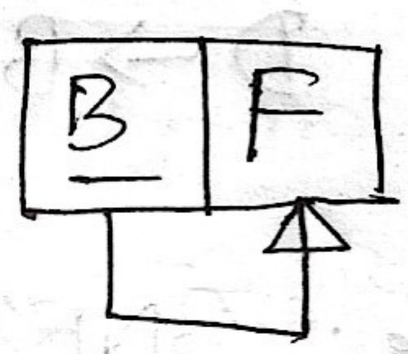
$B \rightarrow F$

This relation has partial dependency. So, it is not in 2NF and obviously

NOT in ~~2NF~~ 3NF too.

2NF Normalization:





Here we can't find any transitive functional dependency, so we can conclude that this is now in 3NF form, (Third Normal form) as well.

P.T.O

Ans to QNo - 5

(1) The candidate key is ABC.

(2) So, the functional dependency of this relation is like :- $ABC \rightarrow DE$.

But we also have 2 functional dependencies as $BC \rightarrow D$ and $B \rightarrow E$.

So, we can see that D and E both can be determined without using all the prime attributes of the primary key. So, they have partial dependency.

So, it is NOT in 2NF form.

Ans. to Q No- 6

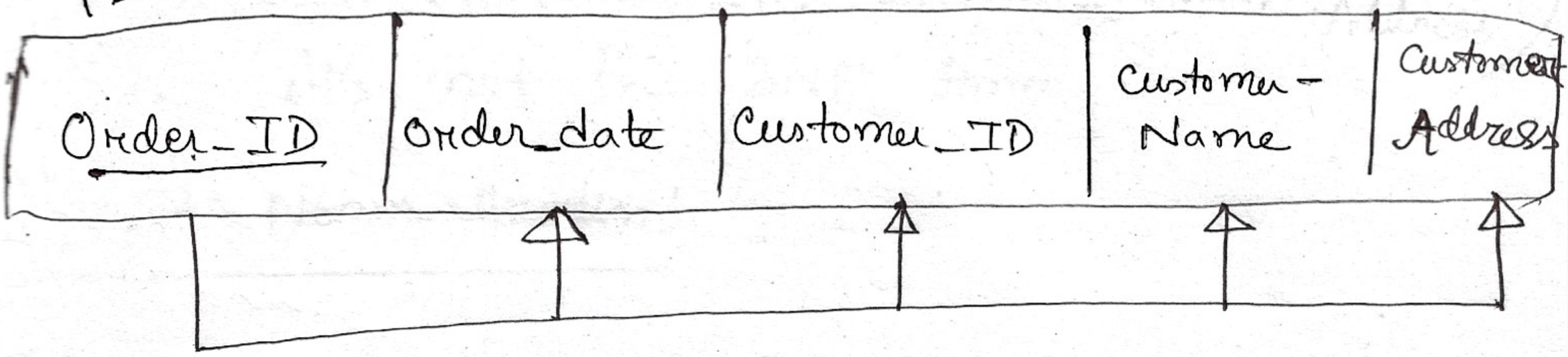
(1) The candidate keys of this relation is (Order_ID, Product_ID)

(2) It is in 1NF form as it has no mutivalued or composite attribute and no nested relation.

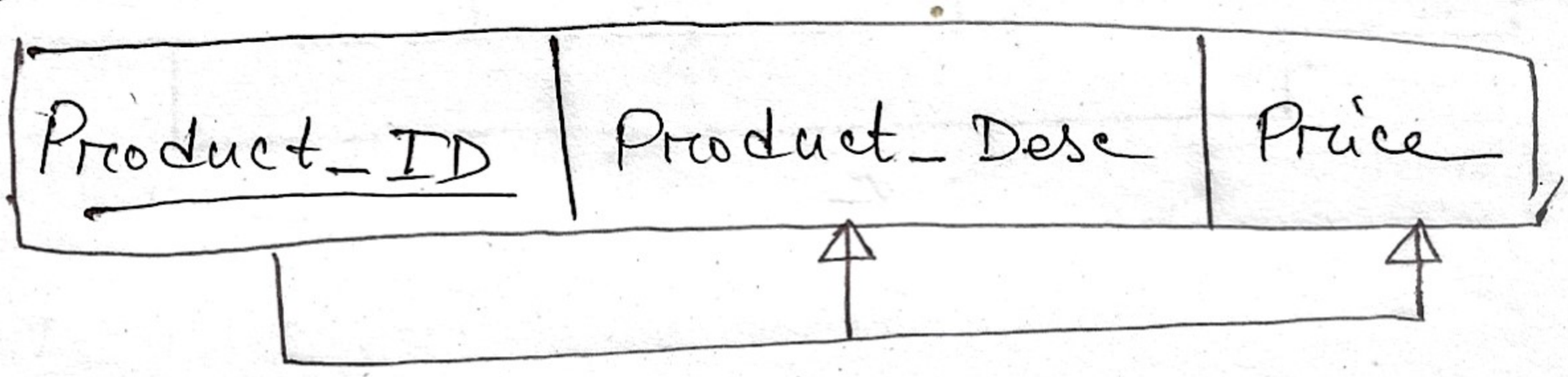
(3) None of B, C, D, E, G, H have ~~fully~~ full functional dependency on the primary key. That's why, this is not in 2NF form.

2NF Normalization:

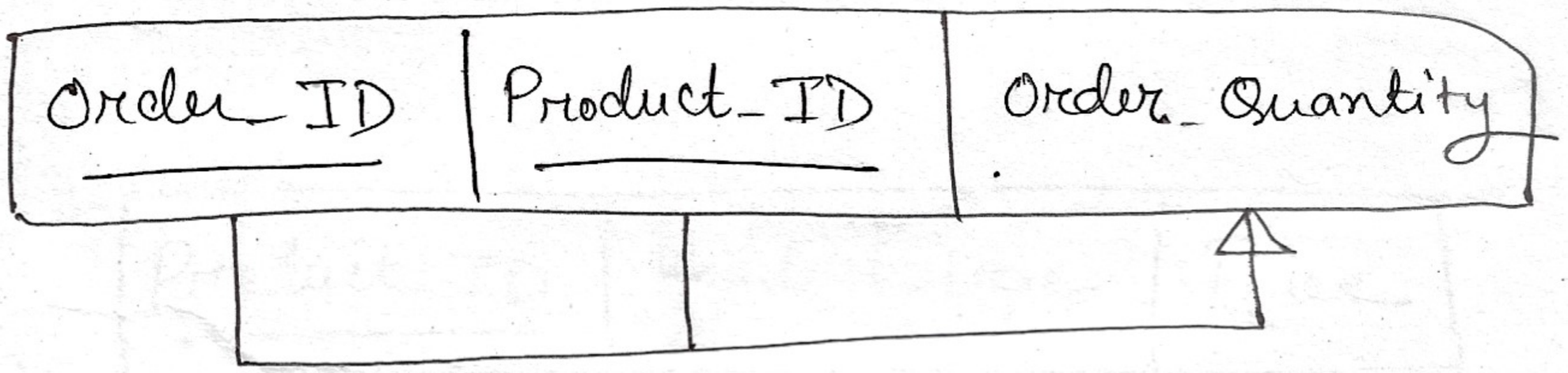
T1



T2



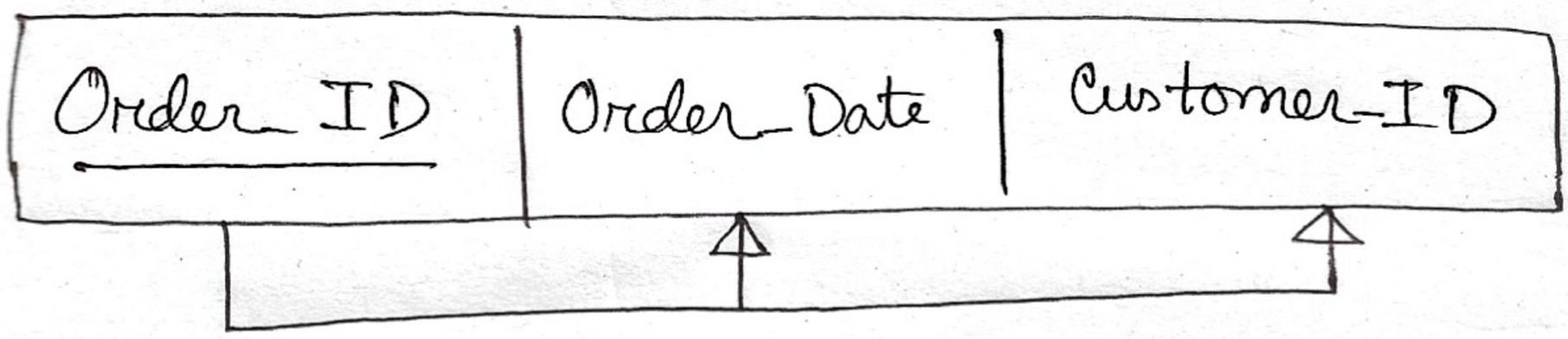
T3



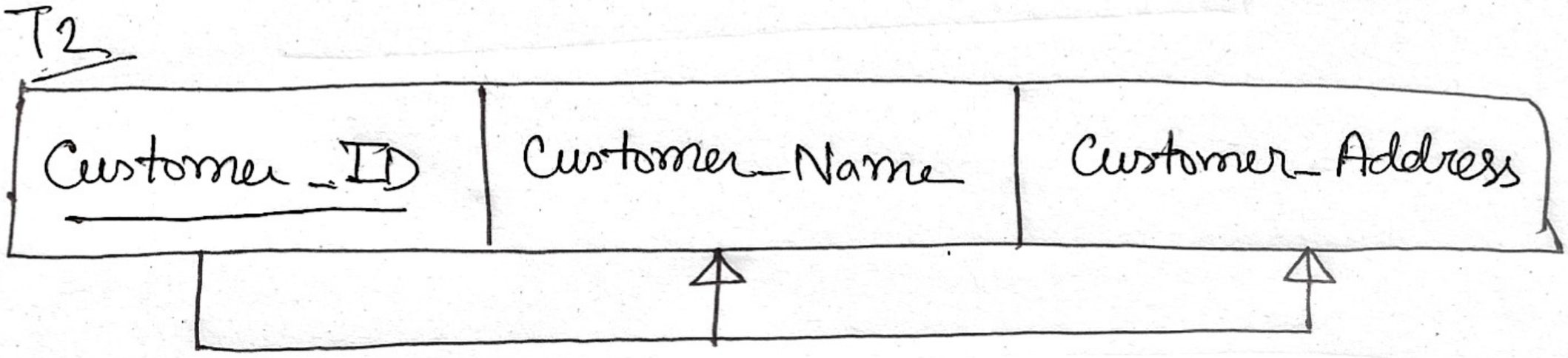
(4) There exists transitive dependency between (Order_ID, Customer_ID, Customer_Name, Customer_Address)
So, it's not in 3NF form.

3NF Normalization:

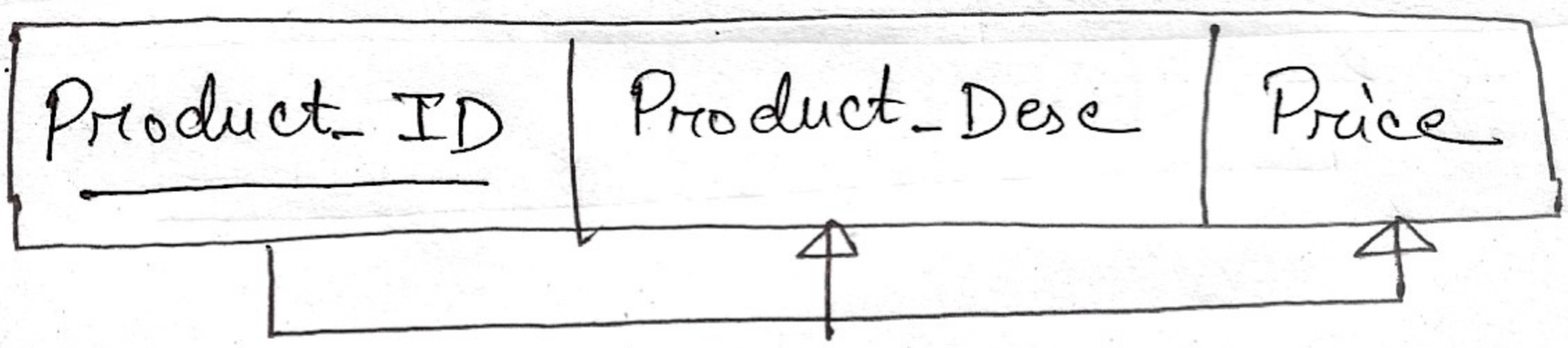
T1:



T2



T3



T4