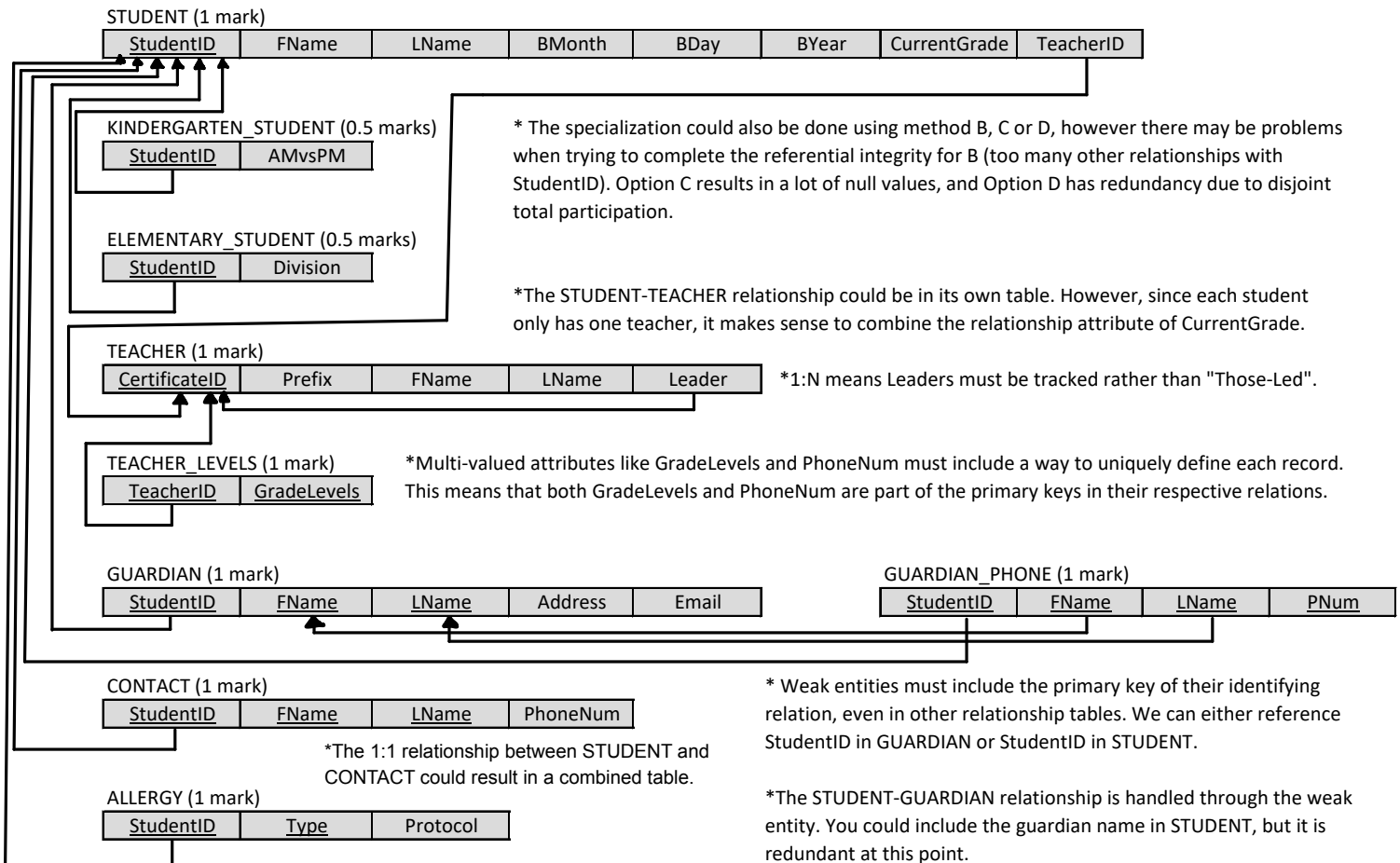
ENSF 608 F21 - Assignment 2 - Question 1 Solution (10 marks)



* The specialization could also be done using method B, C or D, however there may be problems when trying to complete the referential integrity for B (too many other relationships with StudentID). Option C results in a lot of null values, and Option D has redundancy due to disjoint total participation.

*The STUDENT-TEACHER relationship could be in its own table. However, since each student only has one teacher, it makes sense to combine the relationship attribute of CurrentGrade.

*1:N means Leaders must be tracked rather than "Those-Led".

*Multi-valued attributes like GradeLevels and PhoneNum must include a way to uniquely define each record. This means that both GradeLevels and PhoneNum are part of the primary keys in their respective relations.

*The 1:1 relationship between STUDENT and CONTACT could result in a combined table.

* Weak entities must include the primary key of their identifying relation, even in other relationship tables. We can either reference StudentID in GUARDIAN or StudentID in STUDENT.

*The STUDENT-GUARDIAN relationship is handled through the weak entity. You could include the guardian name in STUDENT, but it is redundant at this point.

1 mark for overall neatness/conventions, 1 mark for including all correct referential integrity arrows

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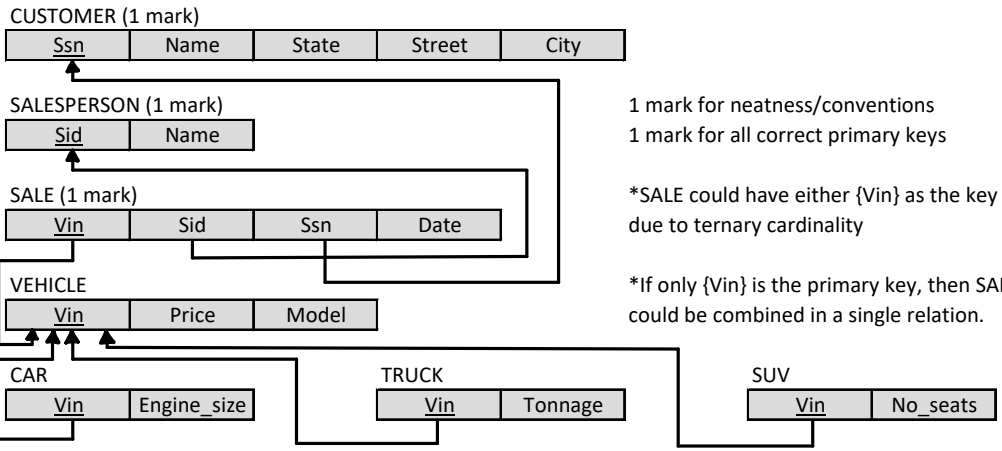


1 mark for neatness/conventions
1 mark for all correct primary keys

*SALE could have either {Vin} as the key or {Vin, Sid, Ssn} due to ternary cardinality

*If only {Vin} is the primary key, then SALE and VEHICLE could be combined in a single relation.

1 mark for correct referential integrity arrows.
*Referential integrity only needs to be demonstrated for one version of the specialization.

Option B 1 mark

CAR

Vin	Model	Price	Engine_size

TRUCK

Vin	Model	Price	Tonnage

SUV

Vin	Model	Price	No_seats

Option C 1 mark

VEHICLE

Vin	Model	Price	VType	Engine_size	Tonnage	No_seats

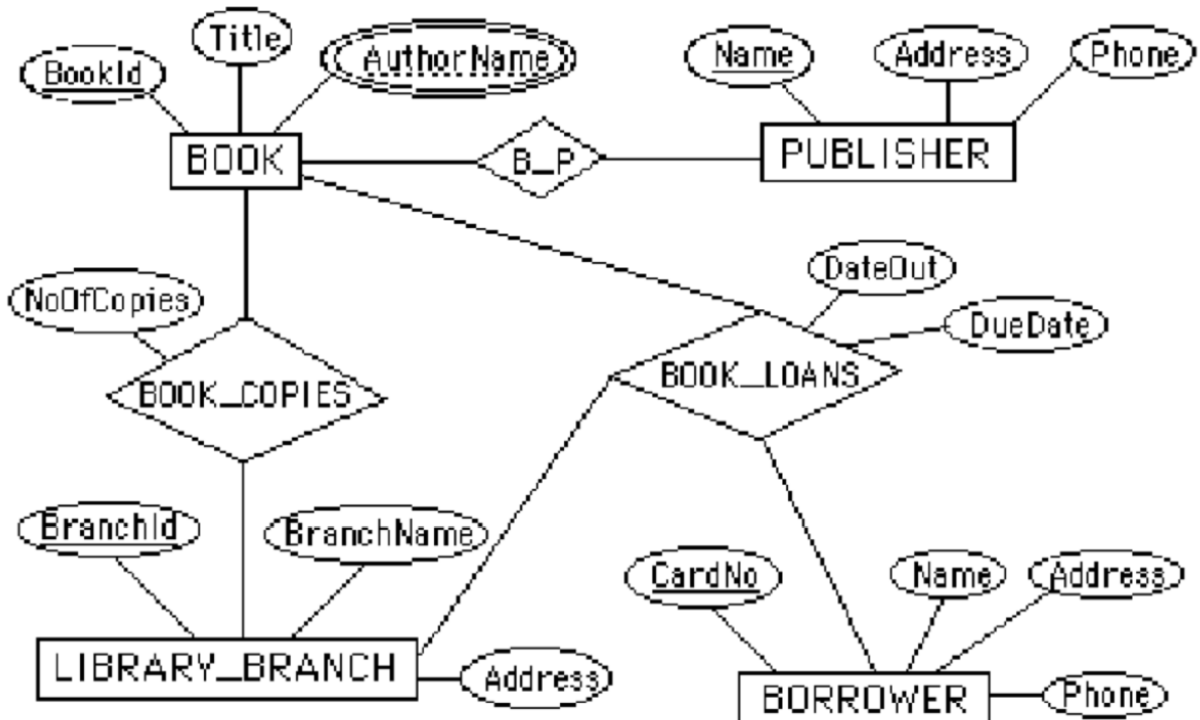
Option D 1 mark

VEHICLE

Vin	Model	Price	IsCar	Engine_size	IsTruck	Tonnage	IsSUV	No_seats

ENSF 608 F21 - Assignment 2 - Question 3 Solution (10 marks)

*Partial underline is used here to denote that AuthorName could have been handled either as a multi-valued attribute OR as a weak entity.



1 mark for each entity: BOOK, PUBLISHER, LIBRARY_BRANCH, BORROWER and their corresponding attributes (4)
1 mark for each relationship: BOOK_COPIES, BOOK_LOANS, BOOK_PUBLISHER and their corresponding attributes (3)
1 mark for handling AuthorName as either a weak entity or multi-valued attribute
1 mark for correctly underlining all primary keys
1 mark for overall neatness/conventions