1)　　**a)**

STUDENT

StudentID
Student Name
Student GPA
Undergrad_or_Grad

Undergrad_or_Grad =

'U'　　'G'

UNDERGRAD

Major
Minor

GRADUATE

Thesis Advisor
UG institution

b)

STUDENT

StudentID
Student Name
Student GPA
Dorm_or_Comm

Dorm_or_Comm =

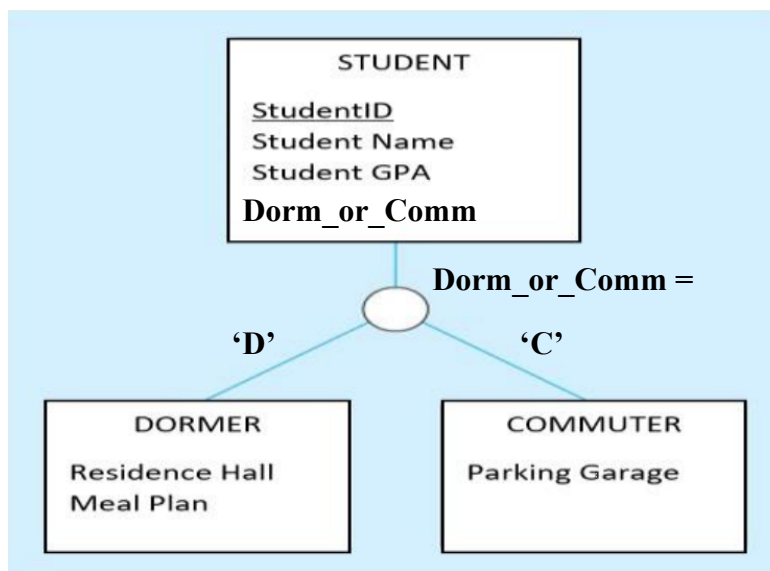'D'　　'C'
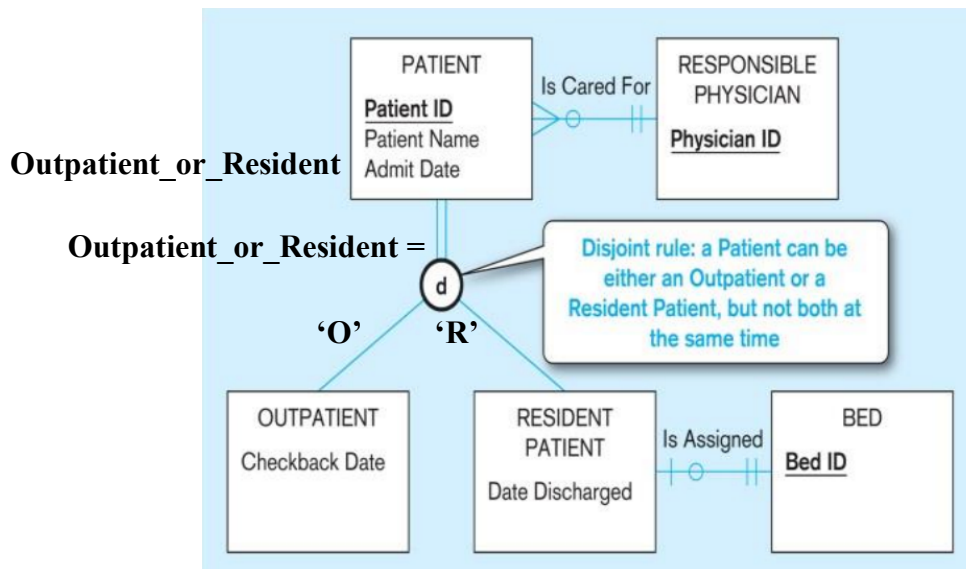
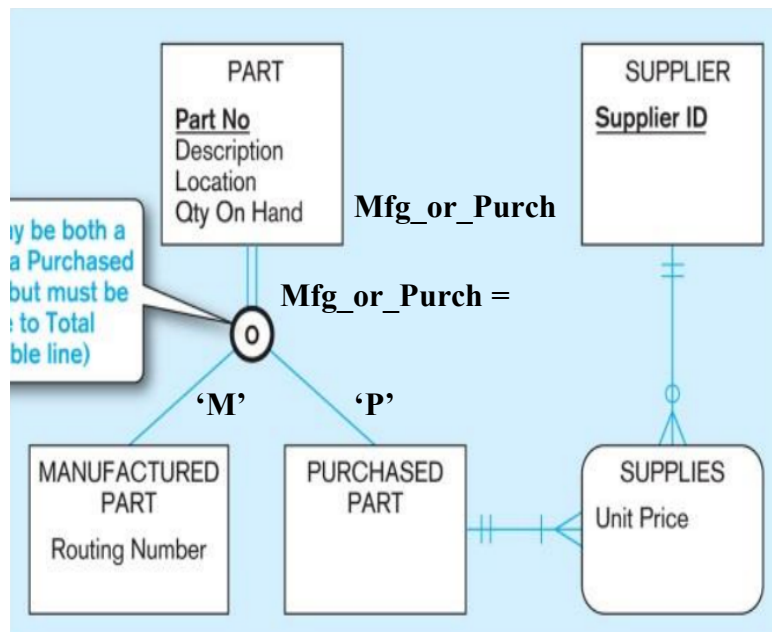DORMER
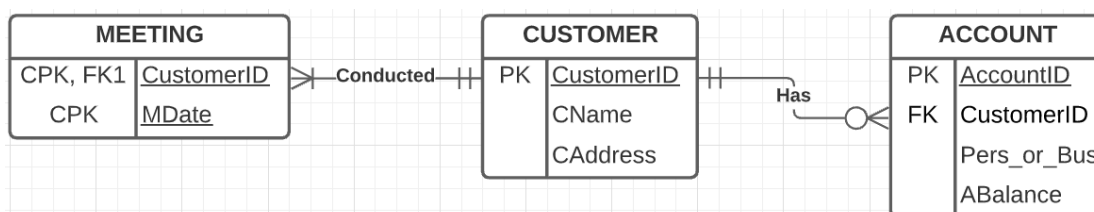
Residence Hall
Meal Plan

COMMUTER

Parking Garage

c) A scenario that might require a different subtype discriminator would be if the organization wanted to identify whether a patient would require a bed assigned to them, in which the subtype discriminator and attribute might be Bed_Needed and can be set to either 'N' as an OUTPATIENT or 'Y' as a RESIDENT_PATIENT.
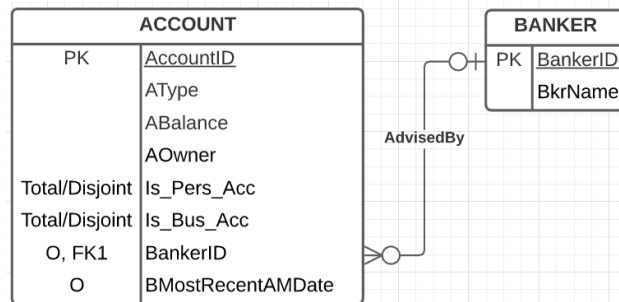
Outpatient_or_Resident

Outpatient_or_Resident =

PATIENT
Patient ID
Patient Name
Admit Date

Is Cared For

RESPONSIBLE PHYSICIAN
Physician ID

'O'   **'R'**

d

Disjoint rule: a Patient can be either an Outpatient or a Resident Patient, but not both at the same time

OUTPATIENT
Checkback Date

RESIDENT PATIENT
Date Discharged

Is Assigned

BED
Bed ID

d) A scenario that might require a different subtype discriminator would be if the organization wanted to identify whether a part was supplied by an external supplier, in which the subtype discriminator and attribute might be From_Supplier and can be set to either 'N' as an MANUFACTURED_PART or 'Y' as a PURCHASED_PART.
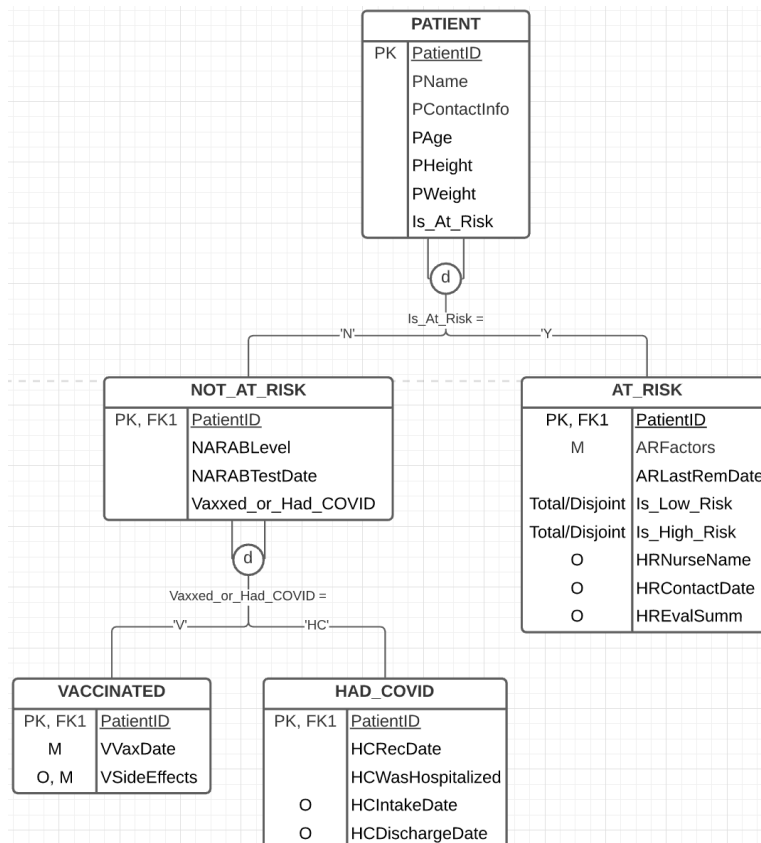

PART
Part No
Description
Location
Qty On Hand

Mfg_or_Purch

SUPPLIER
Supplier ID

...y be both a
a Purchased
...but must be
... to Total
...ble line)

Mfg_or_Purch =

o

'M'   **'P'**

MANUFACTURED PART
Routing Number

PURCHASED PART

SUPPLIES
Unit Price

2)   **a)** I would not create a supertype/subtype relationship for this problem because there is no unique distinction between whether an account is categorized as personal or business.

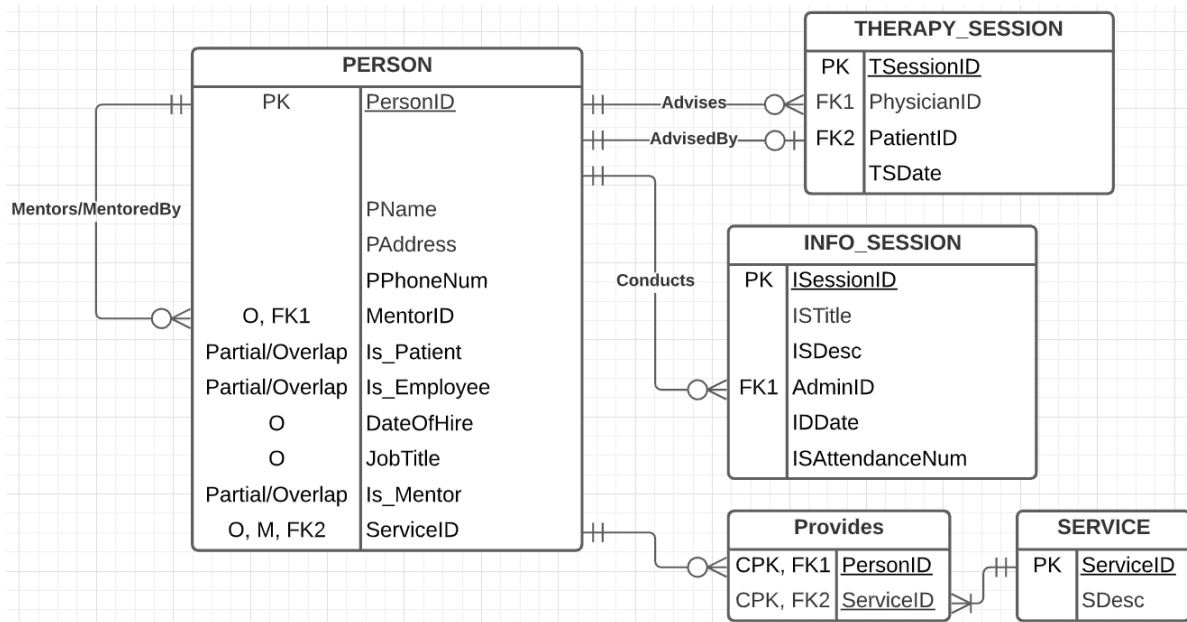| MEETING				CUSTOMER				ACCOUNT	
CPK, FK1	CustomerID	Conducted		PK	CustomerID	Has	PK	AccountID
CPK	MDate				CName		FK	CustomerID
					CAddress			Pers_or_Bus
								ABalance

b) I would not create a supertype/subtype relationship for this problem because the only unique attribute distinction between whether an account is categorized as a personal or business account is that business accounts are assigned a personal banker that the bank also records the most recent annual owner/banker meeting date of. This total designation and disjoint overlap relationship can be handled using attribute flags indicating between personal or business accounts and optional attributes for the additional business account attributes.

ACCOUNT		
PK	AccountID	
	AType	
	ABalance	
	AOwner	
Total/Disjoint	Is_Pers_Acc	
Total/Disjoint	Is_Bus_Acc	
O, FK1	BankerID	
O	BMostRecentAMDate	

BANKER	
PK	BankerID
	BkrName

AdvisedBy

3) I would create a supertype/subtype relationship for this problem because there are unique attribute distinctions between whether a patient is categorized as at-risk or not, in which patients in this database must be of total designation and disjoint overlap. Additionally, there are unique attribute distinctions for determining how a patient is assumed to be not-at-risk, either by vaccination or previously having COVID. An at-risk patient only has unique attribute distinctions for high risk, but not for low risk. Since the only additional data being recorded for high-risk patients is their assigned nurse's name, contact date, and evaluation summary, this can be handled using attribute flags.
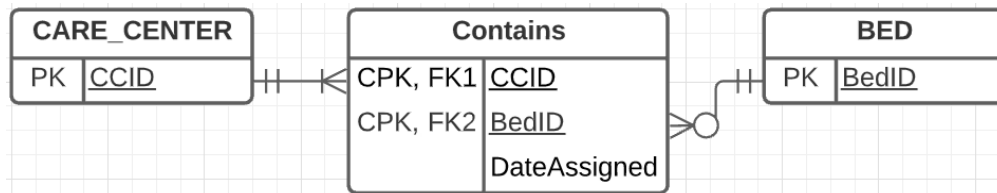
PATIENT	
PK	PatientID
	PName
	PContactInfo
	PAge
	PHeight
	PWeight
	Is_At_Risk

d

Is_At_Risk =

'N'   'Y'

NOT_AT_RISK	
PK, FK1	PatientID
	NARABLevel
	NARABTestDate
	Vaxxed_or_Had_COVID

AT_RISK	
PK, FK1	PatientID
M	ARFactors
	ARLastRemDate
Total/Disjoint	Is_Low_Risk
Total/Disjoint	Is_High_Risk
O	HRNurseName
O	HRContactDate
O	HREvalSumm

d

Vaxxed_or_Had_COVID =

'V'   'HC'

VACCINATED	
PK, FK1	PatientID
M	VVaxDate
O, M	VSideEffects

HAD_COVID	
PK, FK1	PatientID
	HCRecDate
	HCWasHospitalized
O	HCIntakeDate
O	HCDischargeDate

4)

5) **a)** Yes
b) Yes
c) No
d) Yes
e) A foreign key to the primary key of PERSON (e.g., PersonID)
f) Yes
g) Many
h) Many
i) One
j) One
k) Many
l) No, a Care Center is a type of Work Unit, not part of one
m) No, a Care Center is a type of Work Unit, not the other way around
n) True
o)

p)