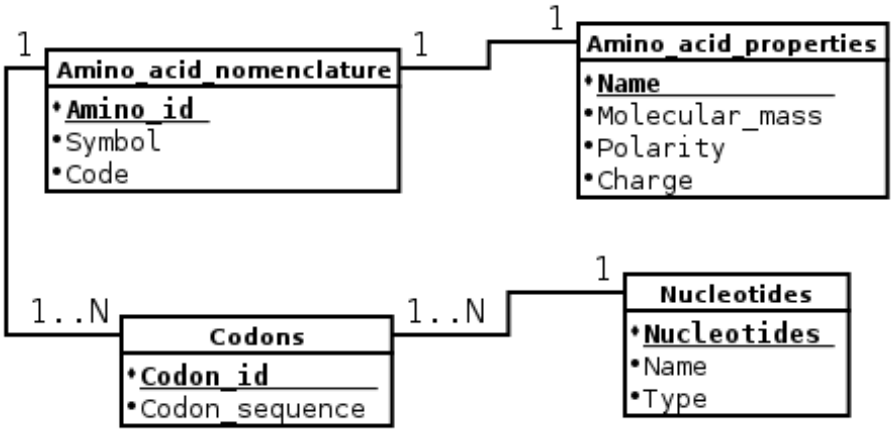
I've removed all "_" from the assignment as they are a PITA to write in latex except for first assignment :)

1

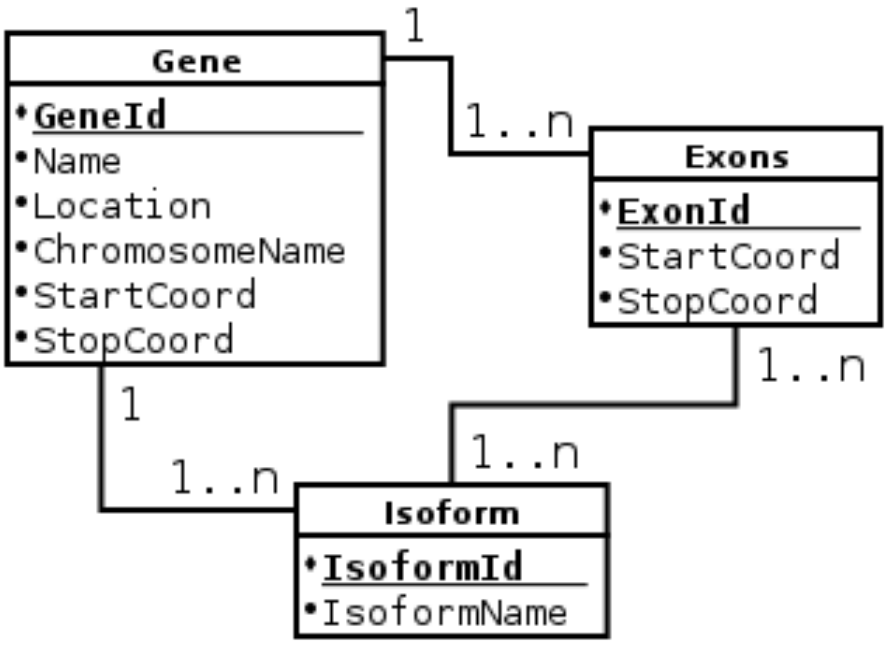


2

i

Gene, Exons and Isoform

ii



iii

Gene(#GeneId, Name, Location, ChromosomeName, StartCoord, StopCoord)
Exons(#ExonId, GeneId*, StartCoord, StopCoord)
Isoform(#IsoformId, GeneId*, IsoformName)
Isoforms(#ExonId*, #IsoformId*)

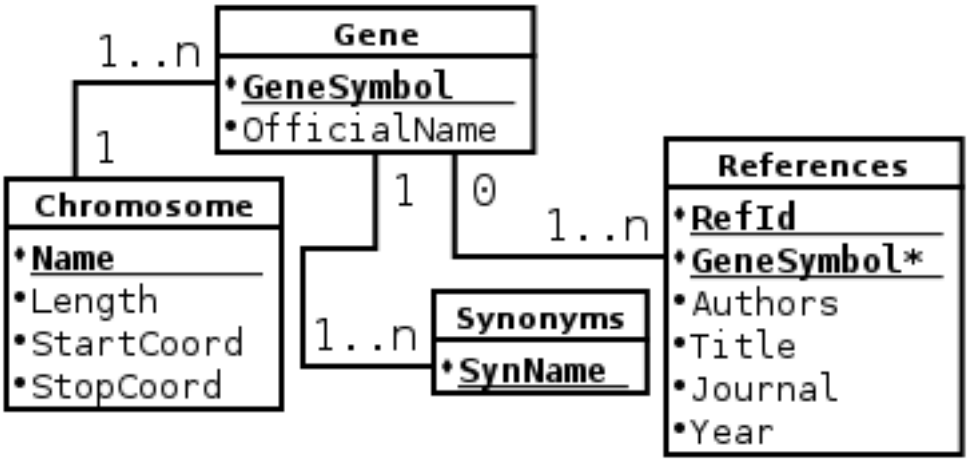
3

i

Entities: Gene, Chromosome, Synonyms and References

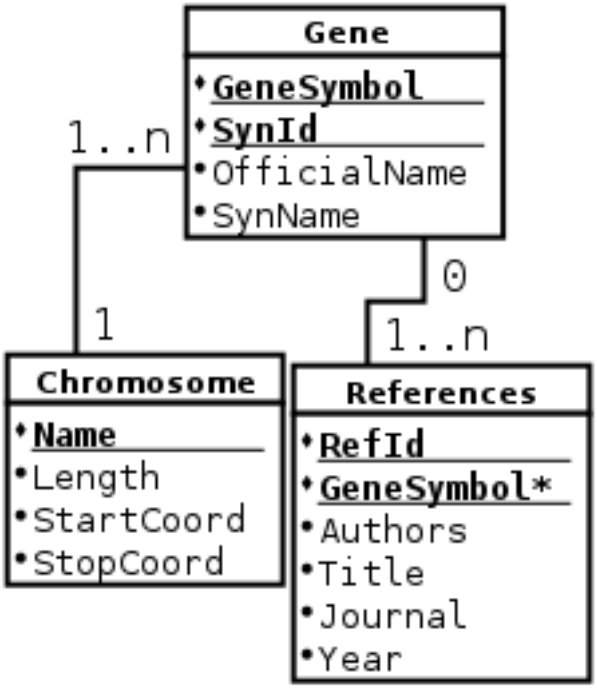
ii

To make the tables 1NF you can't have multiple values in a field. We see that we have to make seperate tables for Synonyms and References. Which incidentally makes the tables into 2NF. We get 3NF when we make a table for Chromosome as well.


Gene
•GeneSymbol
•OfficialName
1..n
1
Chromosome
•Name
•Length
•StartCoord
•StopCoord
1
1..n
Synonyms
•SynName
0
1..n
References
•RefId
•GeneSymbol*
•Authors
•Title
•Journal
•Year

iii

I took a shortcut here :)

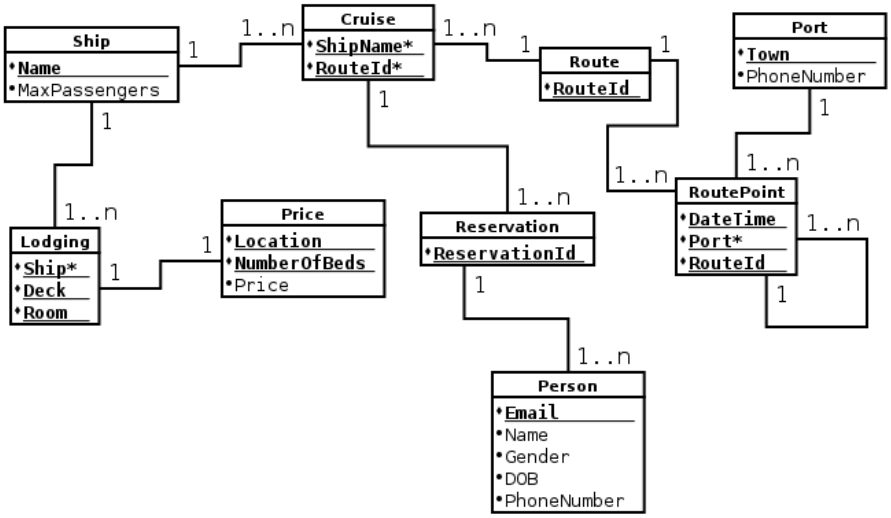


Chromosome(#Name, Length, StartCoord, StopCoord)
Gene(#GeneSymbol, #SynId, OfficialName, SynName, ChromosomeName*)
References(#RefId, #GeneSymbol*, Authors, Title, Journal, Year)

iv

Chromosome(#Name, Length, StartCoord, StopCoord)
Gene(#GeneSymbol, OfficialName, ChromosomeName*)
Synonym(#SynName, #GeneSymbol*)
References(#RefId, #GeneSymbol*, Authors, Title, Journal, Year)

4



5

i

- Missing primary key
- It doesn't keep a record of what truck did what assignment
- It doesn't conform to BCNF, AssignmentNumber should be moved out
- There should be a many many relationship between truck and assignment.
- Not related to this assignment, but considering that there can be multiple trucks involved in an assignment it seems weird that there can only be 1 container in an assignment.

ii

RegistrationYear, Model, MaximumWeight are functionally dependent on RegistrationNumber.

iii

RegistrationNumber

iv

I'm interpreting the assignment as such. Company want to extend their services to include moving their containers, and have generated an extra table to help with that. They are not concerned with logging which truck did what and therefore the answer above, basically meaning they only want to know what truck is currently available. If they did care about logging which truck did what there would be 2 candidate numbers, RegistrationNumber and AssignmentNumber. I'm coming to this conclusion because there is no price for the different trucks, if there is no price difference the assignment will cost the same regardless of number of trucks and what truck is used, thus only needing to know that the amount of trucks available.
With that in mind here are the tables for this assignment.
ContainerType (#TypeId, TypeName, MaxWeight, CubicQuantity, NightlyRate)
Container (#ContainerNumber, TypeId*)
Customer (#TelephoneNumber, Address)
Assignment (#AssignmentNumber, TelephoneNumber*, ContainerNumber*, StartDate, EndDate)
Truck (#RegistrationNumber, RegistrationYear, Model, MaximumWeight, Assignment-Number*)

Just in case, here is the table if they are supposed to log the journeys for trucks. In BCNF (I hope) :)
ContainerType (#TypeId, TypeName, MaxWeight, CubicQuantity, NightlyRate)
Container (#ContainerNumber, TypeId*)
Customer (#TelephoneNumber, Address)
Assignment (#AssignmentNumber, TelephoneNumber*, ContainerNumber*, StartDate, EndDate)
TruckAssigned(#AssignmentNumber*, #RegistrationNumber*)
Truck (#RegistrationNumber, RegistrationYear, Model, MaximumWeight)