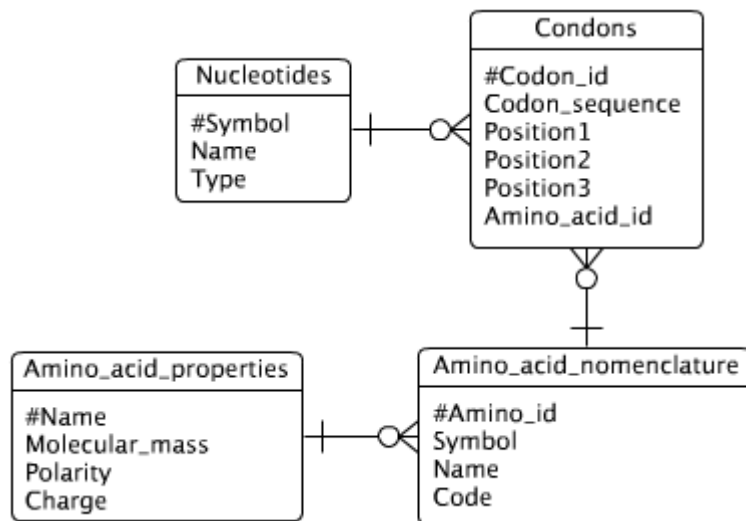
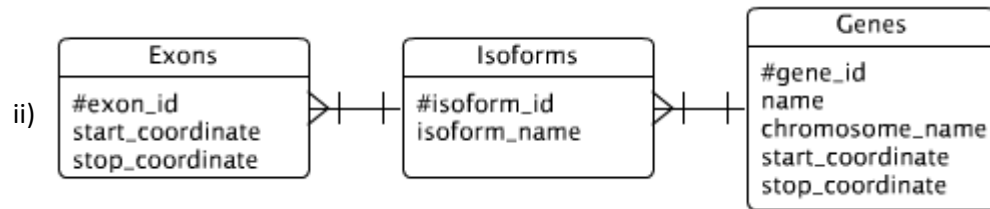


Exercise 1



Exercise 2

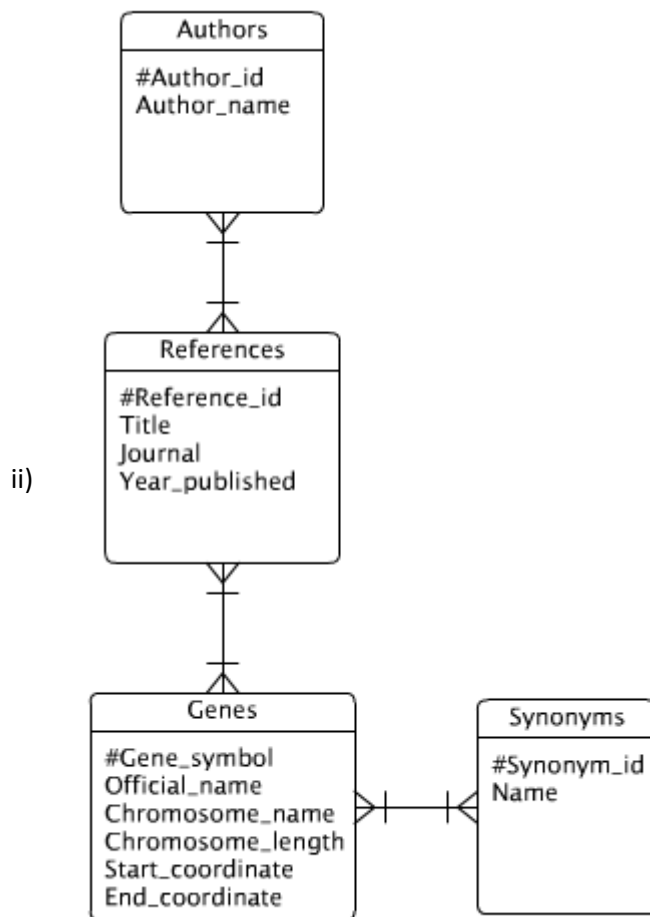
i) Entities: Genes, Exons, Isoforms.



iii) Genes(#gene_id, name, chromosome_name, start_coordinate, stop_coordinate)
Exons(#exon_id, start_coordinate, stop_coordinate, isoform_id*)
Isoforms(#isoform_id, isoform_name, gene_id*)

Exercise 3

i) Synonyms, References, Genes, Author



iii) Reference(#Reference_id, #author_id, author_name, Title, Journal, Year_published)

Genes(#Gene_symbol, Official_name, Chromosome_name, Chromosome_length, Start_coordinate, End_coordinate)

Synonyms(#Synonym_id, Name)

References_Genes(#Reference_id*, #Gene_symbol*)

Genes_Synonyms(#Gene_id*, #Synonym_id*)

iv) Author(#author_id, author_name)

Reference(#Reference_id, Title, Journal, Year_published)

Genes(#Gene_symbol, Official_name, Chromosome_name*, Start_coordinate, End_coordinate)

Chromosome(#Chromosome_name, Chromosome_length)

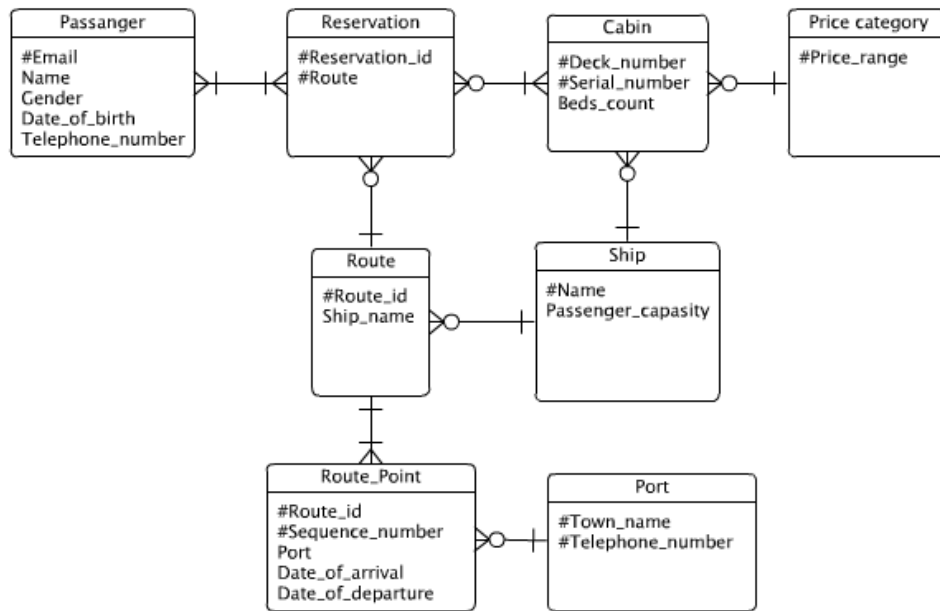
Synonyms(#Synonym_id, Name)

Author_Reference(#Author_id*, #Reference_id*)

References_Genes(#Reference_id*, #Gene_symbol*)

Genes_Synonyms(#Gene_id*, #Synonym_id*)

Exercise 4



Exercise 5

- i) The proposed extension has no primary key. The registration number could potentially be a primary key, but there is little information on where the truck is registered so the registration number might be ambiguous.

Even though multiple trucks can be used for one assignment they will probably be used one at a time during the assignment since the assignment can only involve one container. Trucks can then stay idle for a long period of time as they are currently set up for one assignment, but have either already done their job or is waiting for other trucks.

All information about which trucks were used in an assignment is lost when the trucks are given new assignments.

- ii) Registration_number -> Registration_year
Registration_number -> Model
Registration_number -> Maximum_weight
Registration_number -> Assignment_number
Model -> Maximum_weight
- iii) The Registration_number is the only candidate key
- iv) Truck(#Registration_number, Registration_year, Model*, Assignment_number*)
Model(Model, Assignment_number*)
Customer(#Telephone_number, Address)
Assignment(#Assignment_number, Telephone_number*, Container_number*, Start_date, End_date)
Container_type(#Type_id, Type_name, Max_weight, Cubic_quantity, Nightly_rate)
Container(#Container_number, Type_id*)