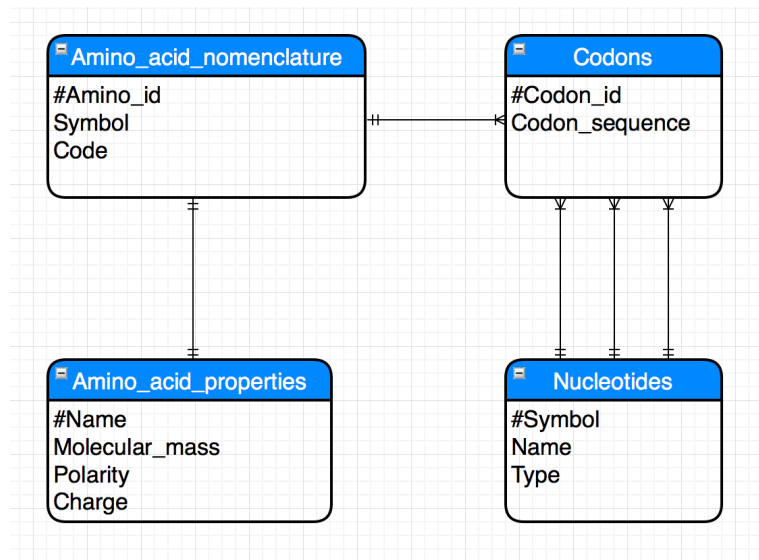
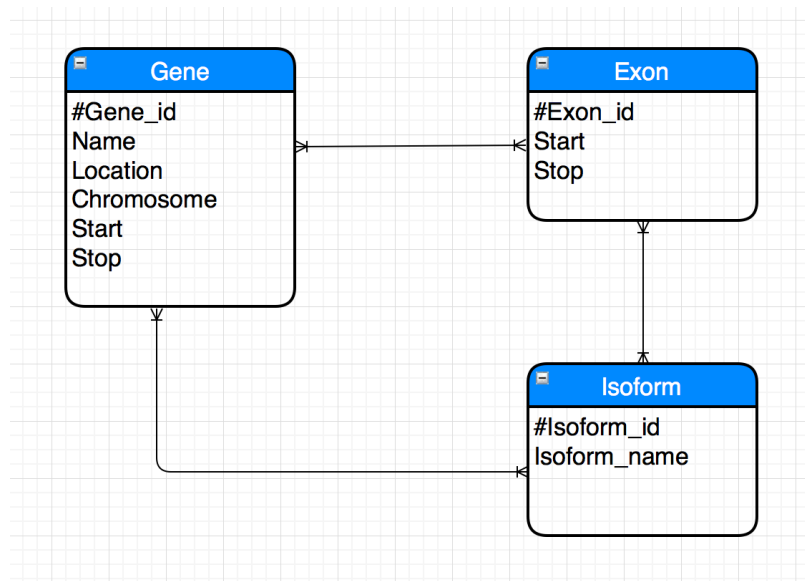


Oppgave 1:



Oppgave 2 i/ii

De tre entitetene: Gene, Exon og Isoform



Oppgave 2 iii

For at ER diagrammet i 2ii skal oppfylle 3. normalform må Name i Gene trekkes ut i en egen tabell. Det er fordi Chromosome, Start og Stop er transitivt avhengige av Gene_id

Gene(#Gene_id, Chromosome, Start, Stop)

Gene_name(#Name, Gene_id*)

Exon(#Exon_id, Start, Stop)

Isoform(#Isoform_id, Isoform_name)

For å løse opp mange-til-mange relasjonene kan man trekke ut til disse tabellene:

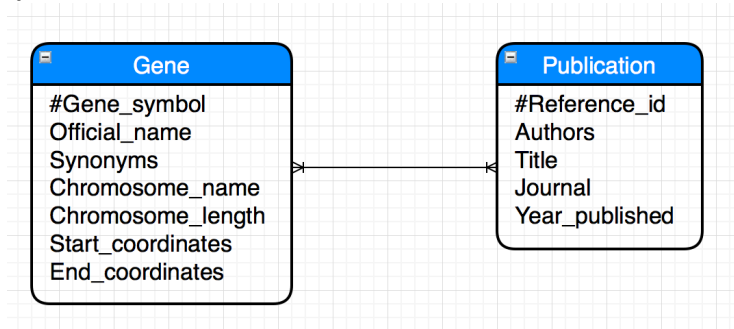
Exons_in_gene(#Gene_id*, #Exon_id*)

Exons_inf_isoform(#Exon_id*, #Isoform_id*)

Oppgave 3

i) Entitetene er Gene og Publications

ii)



iii) Første normalform

Gene(#Gene_symbol, Official_name, Synonym*, Chromosome_name, Chromosome_length, Start-coordinate, End_coordinate)

Synonym(#Synonym_name, Gene_symbol*)

Publication(#Reference_id, Title, Journal, Year_published)

For å løse opp mange-til-mange relasjonene kan man trekke ut til disse tabellene:

Gene_in_publication(#Gene_symbol*, #Reference_id*)

Author(#Author_name, #Reference_id*)

iv) Boyce-Codd normalform

Gene(#Gene_symbol, Synonym*, Chromosome_name*, Start-coordinate, End_coordinate)

Gene_name(#Official_name, Gene_symbol*)

Chromosome(#Chromosome_name, Chromosome_length)

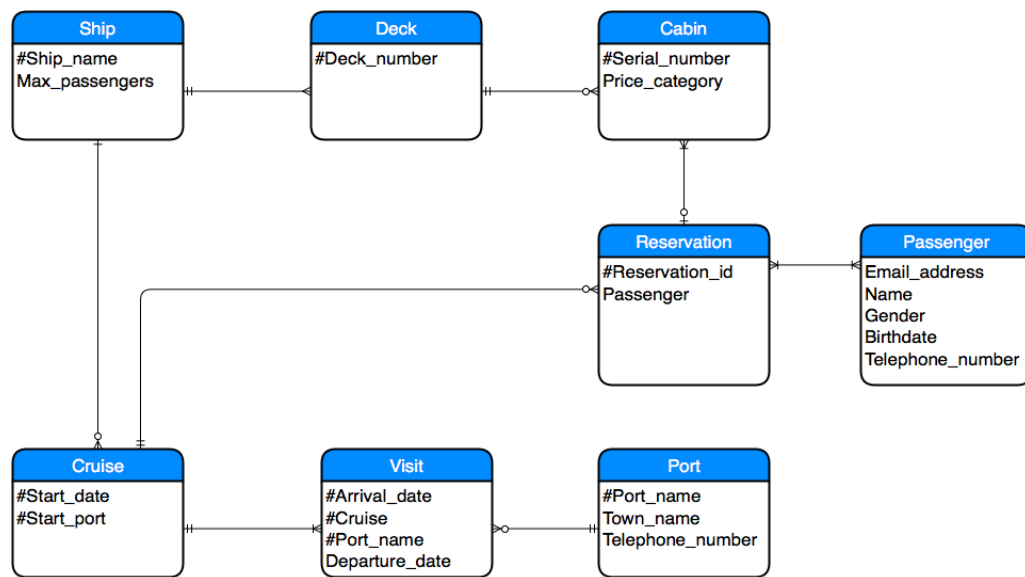
Synonym(#Synonym_name, Gene_symbol*)

Publication(#Reference_id, Title, Journal, Year_published)

Author(#Author_name, #Reference_id*)

For å løse opp mange-til-mange relasjonene kan man trekke ut til denne tabellen:

Gene_in_publication(#Gene_symbol*, #Reference_id*)

Oppgave 4 – Global_cruises**Oppgave 5**

- i) Truck-tabellen har ingen primærnøkkel.
- ii) Registration_number → Registration_year
Registration_number → Model
Registration_number → Maximum_weight
Model → Maximum_weight

Jeg skriver ikke opp noen dependencies til Assignment_number, fordi jeg mener det er feil at den er i denne tabellen i utgangspunktet. Det er fordi en truck må kunne ha flere ulike assignments, derfor bør det lages en ekstra tabell, feks Delivery.

- iii) Slik tabellen ser ut nå er det én kandidatnøkkel: Registration_number og Assignment_number sammen. Det fordi en Assignment kan ha flere trucks.
- iv) BCNF:

Container_type (#Type_id, Type_name, Max_weight, Cubic_quantity, Nightly_rate)

Container (#Container_number, Type_id*)

Customer (#Telephone_number, Address)

Assignment (#Assignment_number, Telephone_number*, Container_number*, Start_date, End_date)

Truck (#Registration_number, Registration_year, Model*, Maximum_weight)

ModellInfo(#Model, Maximum_weight)

Delivery(#Assignment_number*, #Registration_number*)