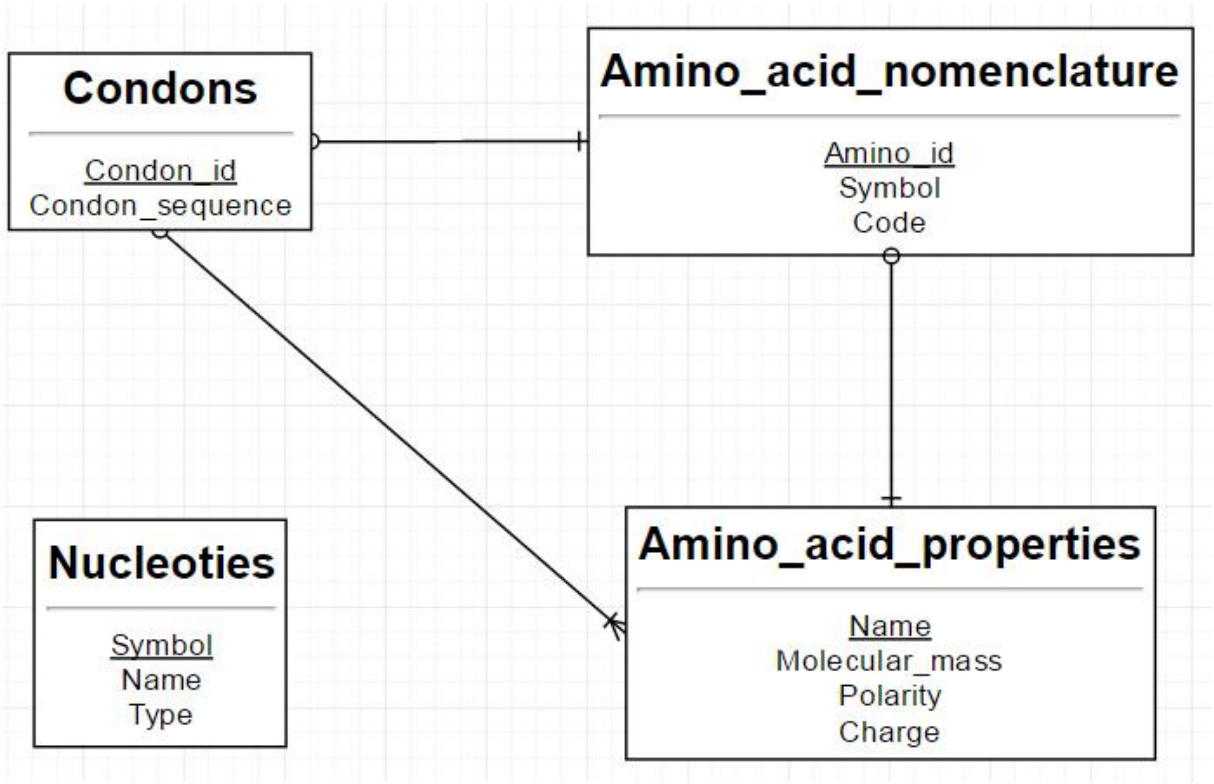
Christian Rønnevik

INF115 Compulsory Exercise 2

1) (10%)

Condons (Condon_id, Condon_sequence, Position1*, Position2*, Position3*, Amino_acid_id*)
Amino_acid_nomenclature (Amino_id, Symbol, Name*, Code)
Amino_acid_properties (Name, Molecular_mass, Polarity, Charge)
Nucleotides (Symbol, Name, Type)



2) (20%)

i) The enteties are the objects: Genes, Exons, Isoforms

ii)

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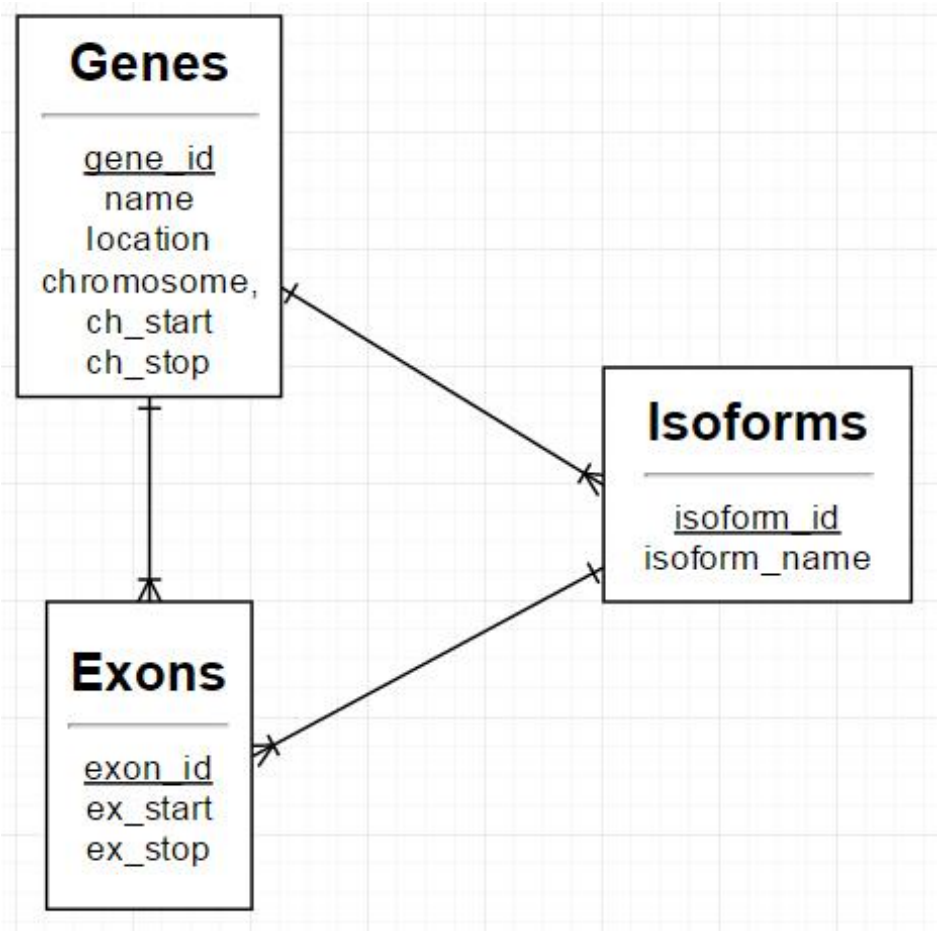


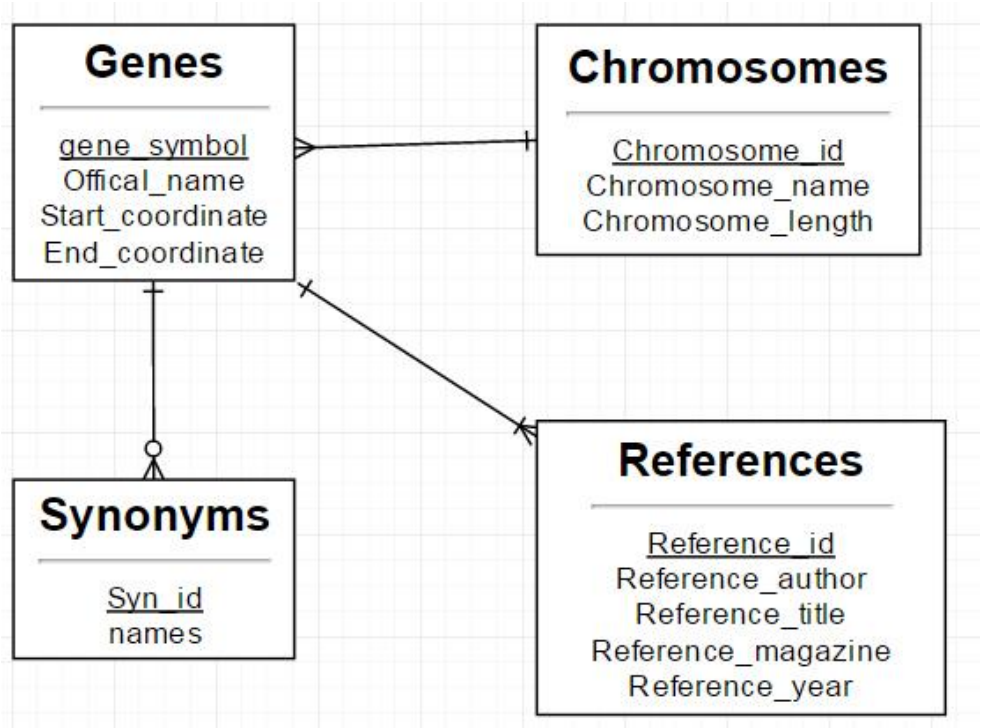
iii)

Tables:

Genes (gene_id, name, location, chromosome, ch_start, ch_stop, exon*, isoform*)
Exons (exon_id, ex_start, ex_stop)
Isoforms (isoform_id, isoform_name, exon_id*)

3) (25%)
i) enteties: Genes, Synonyms, Chromosomes, References

ii)



iii)

Genes (Gene_symbol*, Offical_name, Syn_id*, Chromosome_id*, Start_coordinate, End_coordinate, Reference_id*)

Synonyms (Syn_id, gene_symbol, names)

Chromosomes (Chromosom_id, Chromosome_name, Chromosome_length)

References (Reference_id, Gene_symbol, Reference_author, Reference_title, Reference_magazine, Reference_year)

iv)

Gene_symbol	Offical_name	Syn_id*	Chromosome_id*	Start_coordinate	End_coordinate	Reference_id*

Syn_id	names

Chromsome_id	Chromosome_name	Chromosome_iength

Reference_id	Reference_author	Reference_title	Reference_magazine	Reference_year

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4) (20%)

Ships (ship_name, passengers, cabin_id*)

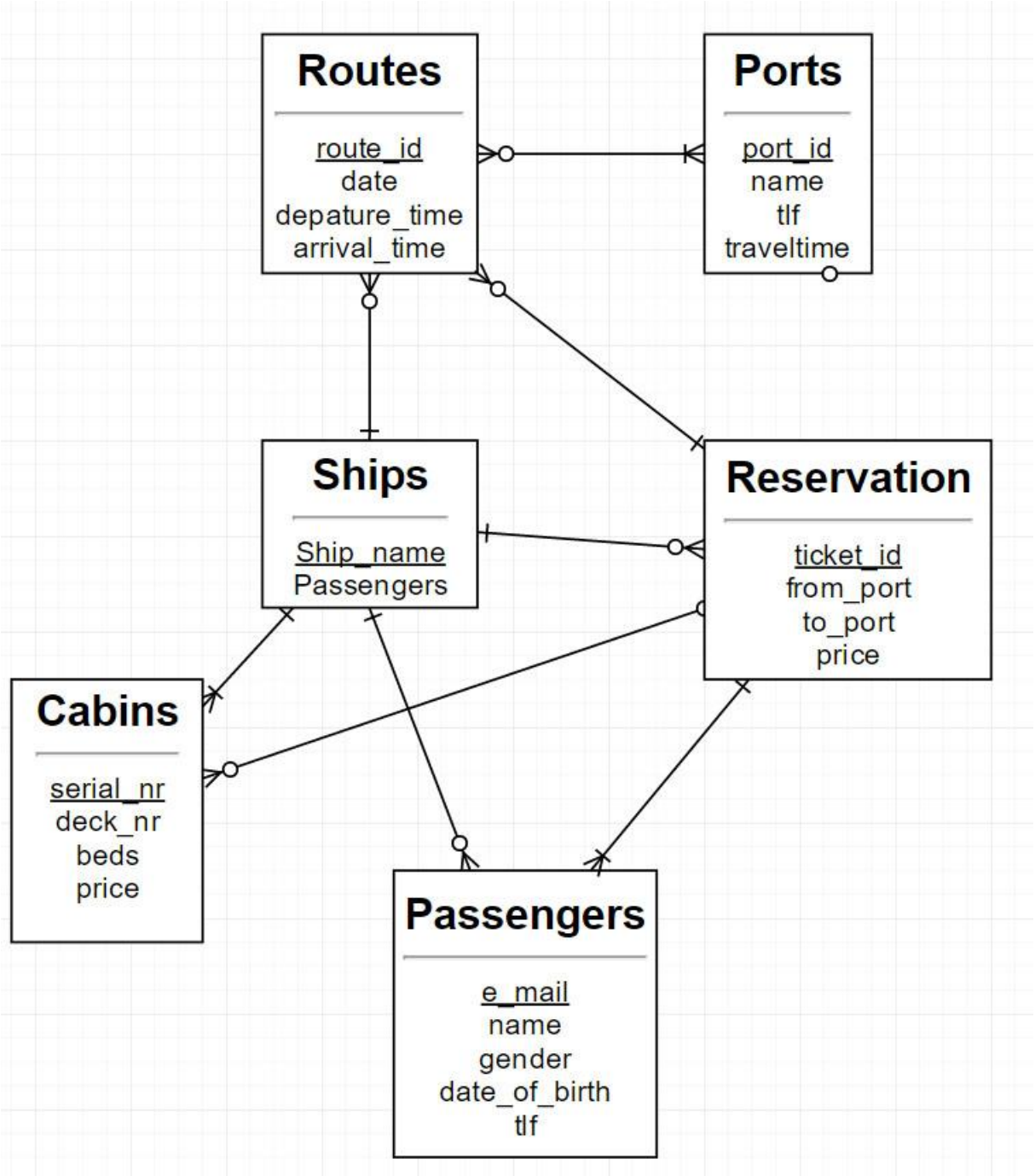
Routes (route_id, date, harbours*, departure, arrival)

Ports (port_id, name, tlf, traveltime)

Cabins (serial_nr, deck_nr, beds, price)

Passengers (e_mail, name, gender, date_of_birth, tlf_nr)

Reservation (ticket_id, ship_id*, route*, passenger*, cabin*, price)



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5) (25%)
i)

When combining the truck specifications with the assignment-number, it implies that one truck can only be linked to one assignment, or else the truck table would yield multiple rows of trucks. Example:
'LY12345', 2012, 'Volvo XL', 8500, 3
'LY12345', 2012, 'Volvo XL', 8500, 4

If the same truck is used to assignment 3 and 4 this would result in redundancy. If we were to change one of the truck attributes due to an error, this would imply that all lines would have to be updated. These attributed should be divided with one table just for a truck, and another one for linking a truck to a specific assignment.

ii)

A truck with registration number LY12345 would always be registered in 2012 and be called Volvo XL and have a maximum weight of 8500. The aassignment number is also related to the truck (registration_number). Hence the functional dependencies would be as followed:
Registation_number → Registration_year, Model, Maximum_weight
Assignment_number → Registation_number, Registration_year, Model, Maximum_weight

ii)

A candidate key is unique and cannot be null. Hence, the registration number serves as the candidate key for the Truck table. The Registration_year is not unique as several trucks can be registered at the same year, and there can also be several trucks of the same model, with same weight maximum. The assagnment

iv)

Truck (<u>Assigment_number, Registration_number</u>, Registration_year, Model, Maximum_weight)