COMP9120 Database Management Systems

Assignment 2: Logical Database Design

Group assignment (10%)

Introduction

This assignment is about the logical database design for an EER diagram included in this assignment description. The objectives are to gain practical experience in relational database schema creation, including integrity constraints, based upon a given entity-relationship (ER) diagram.

This is a group assignment for teams of about 3 members, and it is assumed that you will continue in your Assignment 1 group. You should inform the teaching assistant as soon as possible if you wish to change groups.

Please also keep an eye on your email and any announcements that may be made on Canvas.

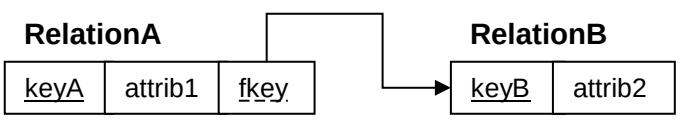
Submission Details

The final submission of your relational database schema is due at 23:59 pm on the 3rd of May. You should submit the *items for submission* (detailed below) via Canvas.

Items for submission

Please submit your solution to Assignment 2, in the 'Assignment' section of the unit's Canvas site by the deadline, including EXACTLY TWO files:

- Firstly, you should submit a sql file (.sql file suffix) containing all DDL statements necessary to fully instantiate a working database for the ER diagram, and DML statements to populate each relation. Your file should run without errors in PostgreSQL 9.5. You can annotate your statements using '--' at the start of lines for comment. You should group your statements for ease of reading (e.g., by keeping all table constraints within the relevant CREATE TABLE statement rather than declaring them externally, if possible).
- Secondly, you should submit a pdf file (.pdf file suffix) including the relational model (RM) diagram that provides a visual model of your database schema. The figure below summarises the syntax to use for the RM diagram.



Design Brief: Relational Database Schema for an iSuper **Electronic Investing System**

Your task is to create a relational database schema for the entity-relationship diagram that is shown on page 3 related to assignment 1. In particular, your solution should include:

- Tables and attributes with suitable data types to capture all information in the model (please use the same names as in the ER diagram for naming tables and attributes);
- Appropriate PRIMARY KEY, UNIQUE, FOREIGN KEY constraints for all tables;
- Correct foreign key specifications including ON DELETE clauses where suitable;
- Appropriate additional integrity constraints expressed by means of NOT NULL, or CHECK clauses;
- INSERT statements to populate each relation with at least one record, to demonstrate a database instance consistent with the EER model.

Additional details

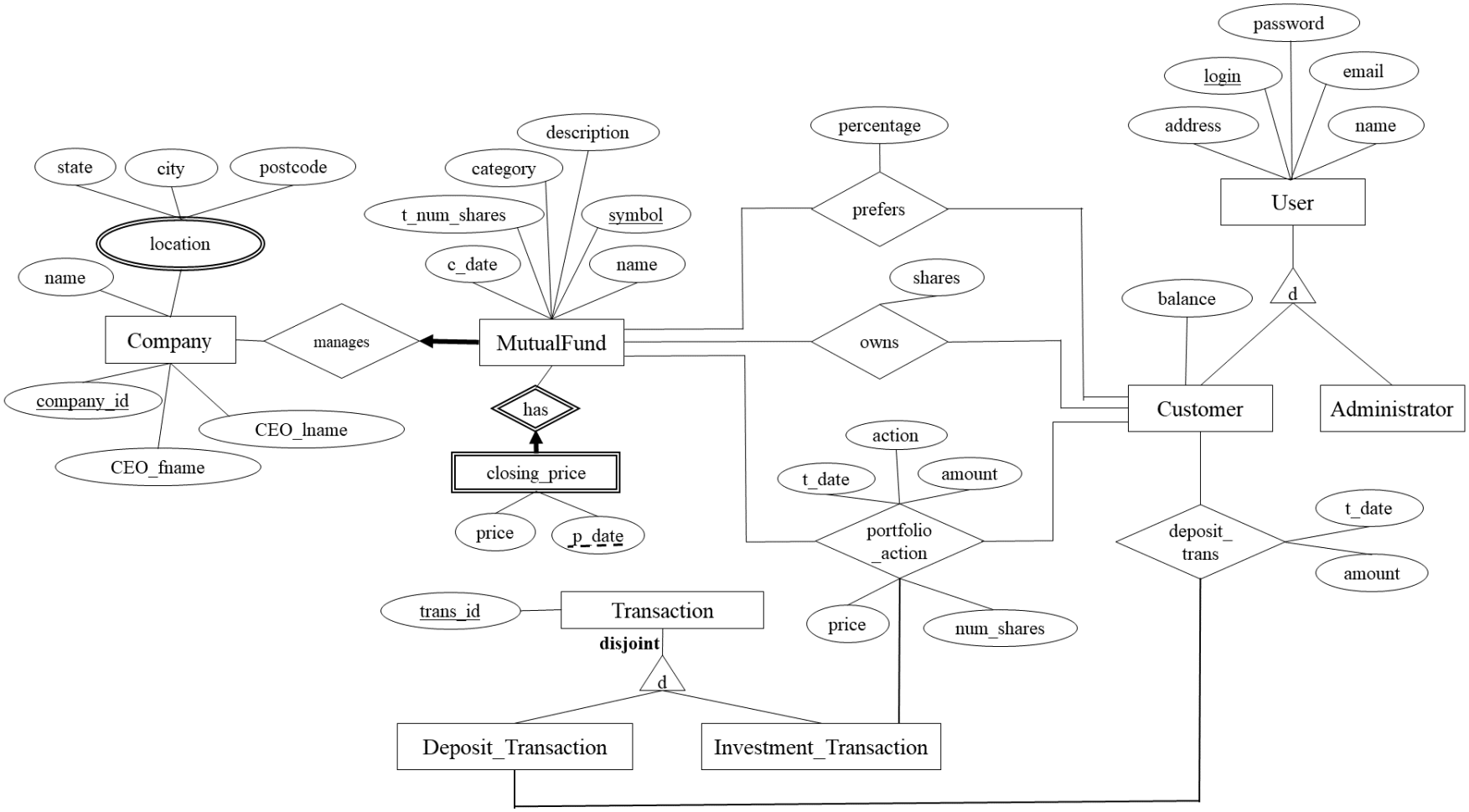
In addition to the model shown in the EER diagram, the following details apply:

1. Fields in a tuple related to dates must always have values.
2. The *amount* of portfolio_action is equal to *num_shares* times *price* (per share).
3. The action in each investment transaction is either ‘sell’ or ‘buy’.
4. Company must be located in Australia.
5. Default value of a company state is ‘NSW’.

Escaping PostgreSQL keywords in DDL

If you need to escape PostgreSQL keywords like “Table”, you will need to use double quotes.

E.g. CREATE TABLE “Table” (…);



This EER diagram is slightly different from assignment 1 solution. Note that there should be total participation constraint between the *Customer* entity type and *prefers* relationship type. But we omit for the sake of this assignment. We also added *Company* entity type and *manages* relationship type which are not included in assignment 1.

Note that *closing price* needs to be modelled as a weak entity for the sake of this assignment. It could also be modelled as composite multi-valued attribute in assignment1.

Marking

This assignment is worth 10% of your final grade for the unit of study.

Your group's submission will be marked according to the attached rubric.

Group member participation

If members of your group do not contribute sufficiently, you should alert the teaching assistant as soon as possible. The course instructor has the discretion to scale the group's mark for each member as follows:

Level of contribution	Proportion of final grade received
No participation.	0%
Full understanding of the submitted work.	50%
Minor contributor to the group's submission.	75%
Major contributor to the group's submission.	100%

Marking Rubric

Your submissions will be marked according to the following rubric, with a maximum possible score of 10 points.

	Novice (0 pts)	Competent (1 pt)	Proficient (2 pts)
Relational Mapping	less than competent schema of the given scenario	all main entities and relationship mapped correctly to relations, with reasonable choice of data type for most attributes	the core model was very well mapped to a relational schema and good choice of data types for all attributes
Key Constraints	no key constraints captured at all	some primary and foreign keys were defined, but either incorrectly or incomplete	all necessary primary keys and foreign keys are given including useful ON DELETE clauses
Semantic Constraints	no further integrity constraints given	some integrity constraints such as CHECK or NOT NULL were defined, but either incorrectly or incomplete	all necessary integrity constraints for the model were given
Example Data	no example data given or yielded multiple errors	some table examples missing or generated an error	database fully populated with a consistent set of data
RM Diagram	no RM diagram submitted	RM diagram does not exactly match the relational schema created by the submitted sql file	RM diagram exactly matches the relational schema created by the submitted sql file (note that: semantic constraints and example data are not required in the RM diagram).