

# Comp2400/Comp6240

## Relational Databases

### Assignment One

Due 5pm 24 August 2007

This assignment puts you in the role of a database developer proposing a database design to a client. The remaining sections of this document are the request for proposals issued by that client. The client may not have been perfectly clear and precise about their business and what they require, but that's life! Make assumptions where you need to, and state them in your report. What you submit for assessment is exactly what you would put in an envelope with a covering letter to send to the client.

Do not use a lot of fancy stationary, bindings etc, just stapled paper. Hand drawn diagrams are fine. Be concise, but provide enough background for the reader. They have more things to do than just reading database proposals.

Hint, PostgreSQL has a datatype for time intervals, given in seconds, minutes, hours etc. These can be added and multiplied just like numbers. See the PostgreSQL manual, §8.5.1.4, and the following SQL snippets.

```
create table timings (k int primary key, i interval);
insert into timings values (1, '42 sec');
select 3*sum(i)+'1 min' from timings;
```

## 1 Business Description

Completely Different Mail-Order Pty. Ltd. takes online orders for printed materials, mostly forms and leaflets. These products are stored in a warehouse, where the orders are printed. Casual picking staff take an order, collect the ordered products and pack it for delivery.

We aim to post orders the working day after they were placed.

We estimate the time taken to pick and pack an order as follows.

- 15 seconds for each product ordered, or 30 seconds if the quantity ordered is greater than 10 pieces
- 30 seconds to pack if the order is to be shipped in an envelope, or 2 minutes if it is goes in a box or boxes

The packaging of an order is determined as follows.

- if the order weighs less than 100 grams, it is sent in a small envelope
- if it weighs between 100 and 500 grams, it is sent in a large envelope
- if it weighs more than 500 grams, it is sent in a box or boxes

## 2 System Requirements

The business is having difficulty accurately predicting the amount of stock, casual labour and packing materials needed to fill the orders on time. At the close of business each day, we have the orders placed during that day, and the amount of stock on hand for each product and packaging item.

1. Do we have enough of each product to fill these orders?
2. For each product, how many days worth of stock do we have if the amount ordered today was ordered every day.
3. How many orders will be packed in small envelopes, large envelopes, box(es)?
4. How many person-hours will it take to pick and pack the orders?

## 3 Deliverables

We require a small demonstration database and queries which provide the information listed above. Specifically, we require:

1. A UML class diagram modelling the required data. The main model elements should be defined and explained in the submission text.
2. A UML object diagram showing a “toy” example showing the orders and stock at the close of a typical business day.
3. SQL code to create a database schema corresponding to the class diagram. (`create_schema.sql`)
4. SQL code to populate the database with a state corresponding to the object diagram. (`populate.sql`)
5. SQL code to provide each item of information listed in the system requirements. (`queries.sql`)

We would also appreciate the following. (*Assessable for Comp6240 students*)

6. Explanation of your choice of UML language features to use, and the UML translation procedure used.
7. Suggestions for further development to better meet our needs.