COMP1140, S2, 2017
Week 5
School of Electrical Engineering and Computing, University of Newcastle
Callaghan, Australia

1. Define the following terms

    a. Insertion Anomaly
    b. Modification Anomaly
    c. Deletion Anomaly
    d. Lossless-join decomposition
    e. Functional dependency
    f. 1st Normal Form
    g. 2nd Normal Form
    h. 3rd Normal Form
    i. Boyce-Codd Normal Form

2. Answer the following questions

With respect to the documents shown in a and b, answer questions i) to v)

a. Examine the Patient Medication Form for the WellMeadows Hospital shown below:

<table>
<tr><td colspan="9">Wellmeadows Hospital</td></tr>
<tr><td colspan="9">Patient Medication Form</td></tr>
<tr><td colspan="9">Patient Number :   P10034</td></tr>
<tr><td colspan="4">Full Name :   Robert MacDonald</td><td colspan="5">Ward Number :   Ward 11</td></tr>
<tr><td colspan="4">Bed Number :   84</td><td colspan="5">Ward Name :   Orthopaedic</td></tr>
<tr><th>Drug Number</th><th>Name</th><th>Description</th><th>Dosage</th><th>Method of Admin</th><th>Units per Day</th><th>Start Date</th><th>Finish Date</th></tr>
<tr><td>10223</td><td>Morphine</td><td>Pain Killer</td><td>10mg/ml</td><td>Oral</td><td>50</td><td>24/03/96</td><td>24/04/96</td></tr>
<tr><td>10334</td><td>Tetracyclene</td><td>Antibiotic</td><td>0.5mg/ml</td><td>IV</td><td>10</td><td>24/03/96</td><td>17/04/96</td></tr>
<tr><td>10223</td><td>Morphine</td><td>Pain Killer</td><td>10mg/ml</td><td>Oral</td><td>10</td><td>25/04/96</td><td>02/05/96</td></tr>
</table>

b. Examine the SuperOffice invoice card shown below:

SuperOffice Office Supplies **Customer Invoice**	

Customer ID: 103659

Customer Name: Frank Jones	Sales Person: Geoffrey Braeburn
Contact: 04 1234 9876	Sales Office: Sydney
Address: 1234 Fake St, Newcastle, 9999	Office Contact: 1800 999 111
Invoice Date: 23/6/2016	Office eMail: sydney@superoffice.me

Invoice ID: X664789

Item ID	Name	Description	Quantity	Unit Price	Total Price
I6374	Pen/Pencil	Assorted Stationary	10	$1.53	$15.53
S3321	Paper	100 sheet white paper	2	$8.43	$16.86

Invoice Total: $32.39
Paid: $32.39
Date: 27/6/2017

    i.   Based on the table and reasonable assumptions, work out corresponding EER model.
    ii.   Mapping the EER model to relational model which is described in Database Definition Language (DBDL) notation
    iii.   Within each relation, identify the functional dependencies represented by the attributes shown in the above form. State any assumptions you make about the data and the attributes shown in the form.
    iv.   Describe and illustrate the process of normalizing the attributes shown above to design a set of relations in BCNF.
    v.   Identify primary, alternate and foreign keys in the relations designed above.

3. Assignment 2 planning – use the rest of the lab time to consider the tasks in assignment 2, raise any questions to your instructor.