

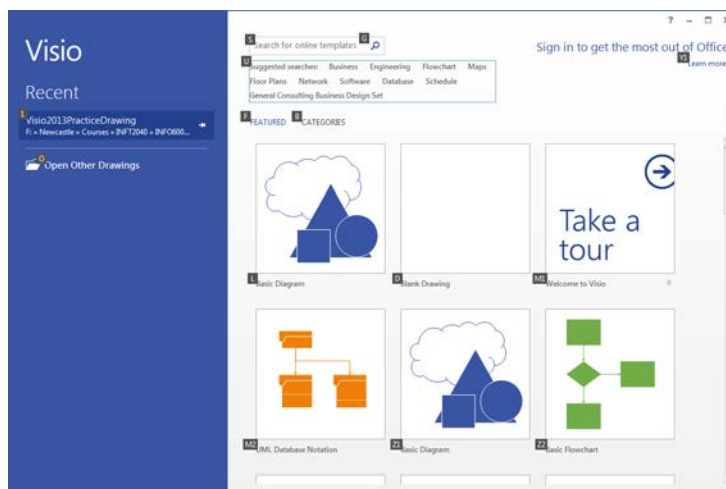
**COMP1140, S2, 2018**  
**Prac/Tute Week 3**  
**School of Electrical Engineering and Computing**  
**Callaghan, Australia**

**1. Introduction on how to draw EER (UML notation) using Visio 2016**

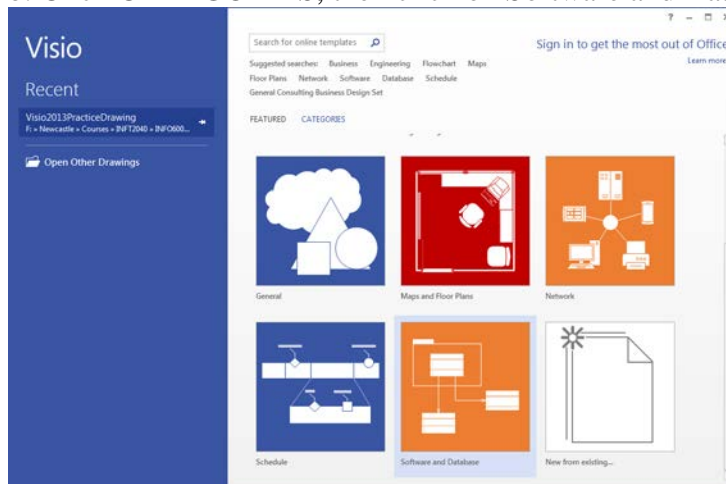
Microsoft Visio 2016 is a flexible software tool that allows users to create some diagrams and charts, such as EER.

***Starting Visio 2016***

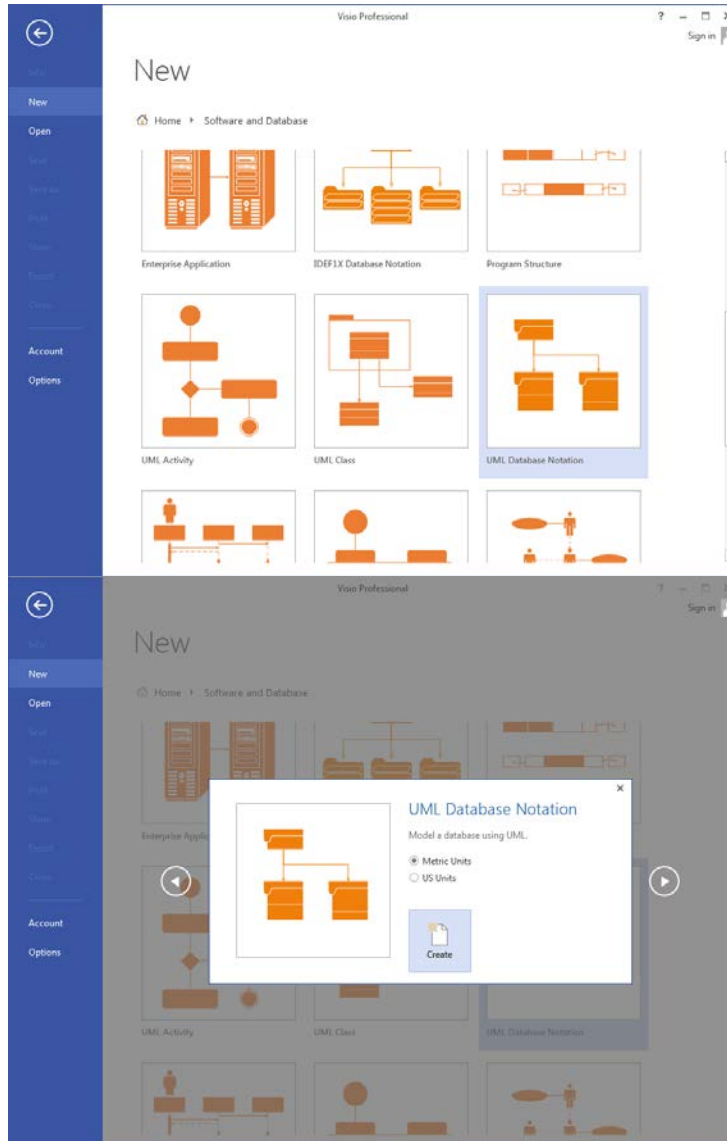
a. Locate the Visio program in the Start Menu → All Apps → Visio 2016. As the program opens, a similar window as below will appear.



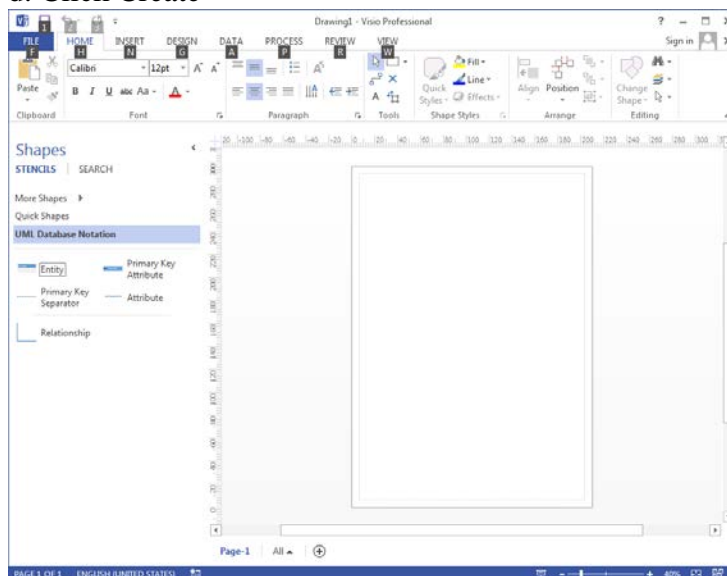
b. Click CATEGORIES, then click on Software and Database:



### c. Click on UML Database Notation



### d. Click Create



- e. Now you can work on building your EER.
- f. Help information can be got from the ? button within Visio. See another file (BeginnersGuideToVisio.doc) from this week's lab directory for the guide.

## **2. Draw EER models for the following requirements**

### **a. Bank Database**

- ABC bank has many branches. Each branch has a BSB number, a branch number, branch name and an address. The branch number, BSB number and name are unique for each bank.
- Each branch contains many accounts. An account contains an account number, balance, customers and an account type to which the account belongs.
- Each account type contains a code, name, description and an interest rate. Account code and name are unique for each account type.
- There are many customers of the branch. Each customer has a customer number, name, address, phone and PIN. Customer number is unique.
- There are many transactions processed for each account. Each transaction has a transaction id, date & time of transaction, type (i.e. debit, credit), amount and responsible party or application for the transaction (i.e. bank, ATM, teller, etc.) and description (interest calculation, etc.)

### **b. University Database**

- University has many types of persons. Each person has a unique id assigned, a name and date of birth.
- Professor is a person with the following attributes: rank and research specialty.
- There are many projects that the university undertakes. A project has a project number (which is unique), a sponsor (e.g. ARC), a grant number, a starting date, ending date and a budget.
- There are students who work on projects. Students are persons. Information about the degree programme (e.g. B.Sc. in Mathematics, M.Sc. in Sociology) that students are enrolled in is maintained. A student can work on a maximum of three projects at any given time.
- Each project is managed by one professor (known as the project's principal investigator). Each project must have a principal investigator.
- A project can have many co-investigators (i.e. professors who work on it).
- There are no restrictions on the number of projects a professor can investigate or co-investigate.

### 3. SQL Exercises

In the following SQL exercises, basic syntaxes for SQL operations are given. You are encouraged to refer to online documentation for examples of full syntaxes.

- a. Log onto SQL Server and create the following table

ACCOUNT

Field Name	Data Type	Comments
accNo	CHAR(12)	Primary Key
accountType	VARCHAR(20)	NOT NULL
customer	VARCHAR(100)	NOT NULL
Balance	DECIMAL(10,2)	CHECK constraint to ensure balance greater than or equal to zero

**Notes:**

- A NOT NULL constraint ensures that NULL values are not allowed as values of the column
- A CHECK constraint can be specified to limit values allowed.  
e.g. CHECK (balance BETWEEN 0 AND 100)

- b. Insert the following data to ACCOUNT TABLE using INSERT statement.

accNo	accountType	customer	balance
6123-1234567	Award Saver	Peter Wang	12,234.94
0231-2342142	Cheque	Mary Alison	5,342.98
8232-3231134	NetSaver	Ally Kent	23,112.33
6123-1234568	Cheque	Peter Wang	231.31

- c. You can ask questions (also known as queries) using the SQL's SELECT statement.

**Notes:** Using SELECT statement, you can specify attribute/fields to display and specify condition(s) for resultant rows to satisfy

```
SELECT      <attribute-list separated with commas>
FROM        <table list>
WHERE       <condition-list>
```

**E.g.** To display customer's name with account number 6123-1234568, we can execute the following SELECT statement.

```
SELECT      customer
FROM        Account
WHERE       accNo = '6123-1234568'
```

You can create complex conditions using AND and OR operators.

Write SQL SELECT statements for the following:

- i. Display customer's names and balances for all accounts.
  - ii. Display all account information for accounts with balance greater than AUD 5000.
  - iii. Display all account numbers of accounts of Mr. Peter Wang
  - iv. Display all information of accounts of type 'Cheque' with a balance over AUD 1000.
  - v. Display all account information of customers 'Ally Kent' and 'Peter Wang'.
- d. Add AUD 100 to account 0231-2342142 using UPDATE statement

**Note:** The syntax of the basic UPDATE statement is as follows:

```
UPDATE    <table>
SET       <column> = expression/value
WHERE     <condition-list>
```

(**Hint:** You can add 100 to the balance column by using the expression:  
balance + 100)

- e. Delete all accounts of Ally Kent

**Note:** The syntax of the basic DELETE statement is as follows:

```
DELETE    <table>
WHERE     <condition-list>
```

### Homework Task

(Note: an answer to this practice will be provided in the following week.)

Draw an EER diagram for the following scenario:

ToyCo is an online store specialising in children's toys for ages 2-7. Its online catalogue records the following information:

- Each toy has a name, price, description and gender (male, female, unisex). Toys are identified by a unique ID. The name of each toy must be unique, and the price must be greater than zero.
- Toys are categorised into a category. A category has a name and description and is identified by an ID.
- A toy can be appropriate for many age groups. An age group must be between 2 and 7 (inclusive). Each toy must have one age group.
- ToyCo often has sales which apply specials to items. A Special is identified by a unique number, and records the item, discount, discounted price, start date and end date. The start date must not be after the end date, and the end date must not be before the start date.
- ToyCo allows customers to sign up and purchase items. A customer supplies their name, password, address, email and contact number. Customers are identified by a unique number.
- A customer creates a transaction when they wish to buy items. A transaction requires at least one toy. Apart from the toys purchased, a transaction has a transaction number, customer, date, total and status (unpaid, paid, sent).