

## Week3: Second Tutorial

- TA goes over Access assignment requirements

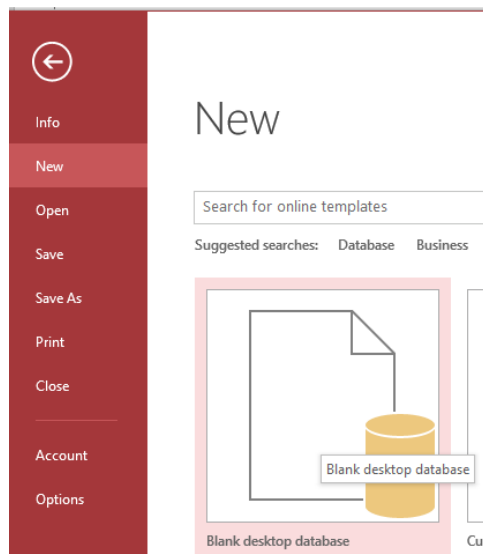
## First Tutorial

- Monday, Tuesday: Oct 9 & 10 tutorials were not held due to the Thanksgiving holiday

## TA Covering Requirements For The First Graded Assignment 'A2'

- Web address of assignment description:
  - <http://pages.cpsc.ucalgary.ca/~tamj/2017/203F/assignments/assignment2/>
- TA will go through Features in the assignment that you are to implement and:
  - TA **will explain** the end result produced when you complete the feature
  - TA **will not** specify the details of how to produce that result (because that is 'the answer')
- TAs will go through the style requirements of assignment and point out how missing a style requirement will affect grading
  - The specifics of each style requirement comes later in lecture and in some cases in tutorial as well e.g. absolute vs. relative cell references
  - Sometimes screenshots will show you how it's done.
  - **The TA will explain the details later.**
  - The early preview is provided so you 'recognize' it later in lecture and tutorial when you see it.

## Review: Create A Blank Database

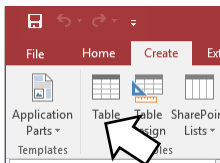


## Part I, A2: Creating The Database And Error Prevention

- Creating the two tables
- Creating attributes (appropriate name and type), defining the appropriate error prevention mechanism
  - Modifying the Employees table
  - Modifying the Locations table

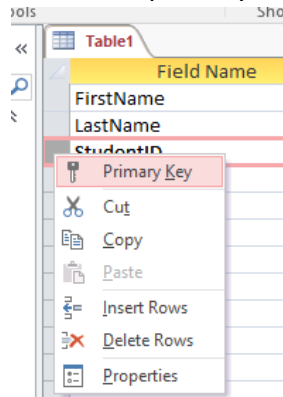
## Creating The Tables

- Employees and locations (one table is automatically created and opened in 'Datasheet View' when a new Access database is created).



## Set Primary Key

- Define the primary keys for the two tables



- Make sure you choose an appropriate attribute (recall the characteristics of primary keys)

## Modifying the Employees Table

- EmployeeNumber
- LocationID
- BaseSalary
- YearsOfService
- Email

## Modifying The Tables

- For each attribute you get 0.05 for creating the (appropriately named attribute).
  - This is regardless of whether the type of information (“Data type”) is appropriate and can be earned if error prevention has been defined
  - That is: these should largely be easy to earn marks!

Field Name	Data Type
LocationID	OLE Object
PostalCode	Yes/No
City	Date/Time

**JT: Data Types are all completely wrong so don't follow this example!**

Q:What “Data Types” should be used?

A: Some attributes should be obvious. For others look for clues in the assignment description. Also the error prevention required should give you clues.

Recall: The TA is here to explain what you should do not tell you how you do it (that's up to you to figure out).

## EmployeeNumber

- 9 digits with every digits separate by a space
- JT's Question: Digits are used but are these digits ever used in a calculation?
- OK
  - 999 999 999
- Not OK
  - 99 9999 999
  - A99 999 999
  - 123456789

## LocationID

- A foreign key that refers to the LocationID field in the Locations table.
  - We never want an employee to come from a location that does not exist in the locations table
  - Example (invalid)

EmployeeNumber	Location	
111 111 111	99	

LocationID	PostalCode	City
1	NONON0	Yellow Knife
2	NONON1	Yellow Knife
3	NONON2	Yellow Knife

## BaseSalary

- A positive numeric value that indicates the base dollar compensation earned by the employee.
- OK
  - \$1
  - \$666,777
- Not OK
  - \$0
  - \$-123
- Starting (default) value must be non-negative

BaseSalary	
*	\$1.00

## YearsOfService

- Non-negative number
- OK
  - 0 years (i.e. a new employee)
  - 1 year
- Not OK
  - -13 years

## Email

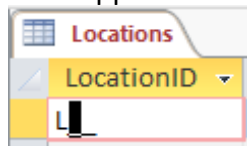
- 6 field/format requirements (0.6 GPA for error prevention)
  1. *<One alphabetic character>*
  2. *<Any number of any type of character>*
  3. @
  4. *<One alphabetic character>*
  5. *<Any number of any type of character>*
  6. *<.com>*
- OK
  - [a@a12.com](mailto:a@a12.com)
- Not OK
  - [1@a.com](mailto:1@a.com)
  - [1.com](mailto:1.com)
  - [a@a.ca](mailto:a@a.ca)

## Modifying the Locations Table

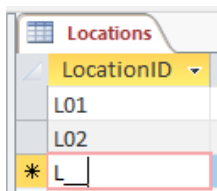
- LocationID
- PostalCode
- City

## LocationID

- Primary key
- What appears when the location ID is entered: "L" appears



- What is stored in the location ID: "L" is not stored



Access: Datasheet View

	A
1	LocationID
2	01
3	02
4	

Actual data exported to Excel



## PostalCode

- Six characters in the following format:  
`<char><digit><char>-<digit><char><digit>`
- OK
  - N0N-0N0
- Not OK
  - N0N0N0
  - N0N 0N0
  - 0N0-N0N

## City

- As described in the assignment, just create the attribute with an appropriate name and appropriate “Data Type”

## Creating Tables: Style Requirements

- Filling in the description field
- Clear and helpful error messages
- Choosing logical data for an attribute, good naming conventions

## The Description Field

The screenshot shows a table design tool window titled "Locations". The table has three columns: "Field Name", "Data Type", and "Description (Optional)". The "PostalCode" row is highlighted in yellow. A red dashed box highlights the "Description (Optional)" column.

Field Name	Data Type	Description (Optional)
LocationID	Short Text	
PostalCode	Short Text	
City	Short Text	

## Clear And Helpful Error Messages

- (From the assignment, these error messages): “...helps the user keep from making the same error again”
- Example age must be a number from 1 – 114.
  - Helpful error message (it should be hard to go wrong with something so specific)
    - “Age must be a number from 1 – 114”
  - Poor/unhelpful error messages:
    - Invalid age (Not specific, the use of ‘invalid’ is somewhat intimidating)
    - Age is wrong (Not specific, if it’s ‘wrong’ then what is ‘right’)
    - Bonehead! (Wrong for an error message, just wrong....)

## Logical Data Type

- As mentioned it should be obvious how to pick a valid “Data Type” based on the description for each attribute and/or the error prevention required
- But here’s a completely incorrect example again if you need it:

Locations	
Field Name	Data Type
LocationID	OLE Object
PostalCode	Yes/No
City	Date/Time

## Naming Tables And Attributes

### Tables

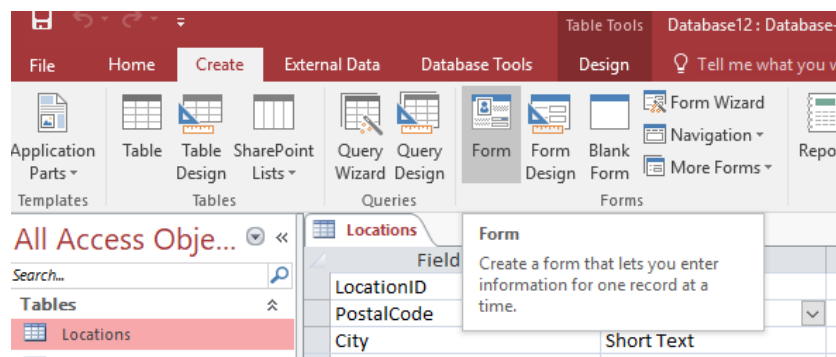
- Unique and descriptive name.
  - Bad: 'X', 'Money', 'ACT' (abbreviation)
  - Better: 'Students', 'Courses' (could depend upon context however)
  - Avoid using spaces e.g. 'FirstName', "Cell\_phone"
  - Generally avoid singular names ("Student" vs. "Students")

### Attributes

- Same rules for tables applies
- However attributes should be singular rather than plural e.g. 'HomeAddress' vs. 'HomeAddresses'

## Creating Graphical Form For Data Entry Into A Table

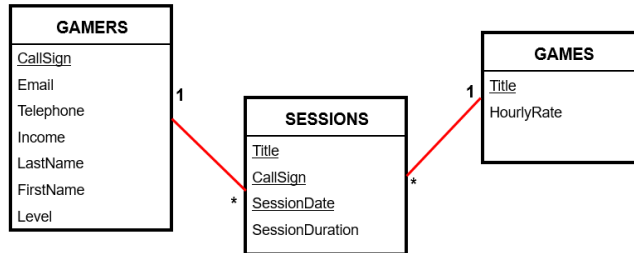
- "Creating a graphical interface for entering new data:"
- Create->Form



- Note: you only have to this for the table that is likely to undergo many changes "Employees"

## ERD: Standard Diagrammatic Notation

- (From the lecture example)



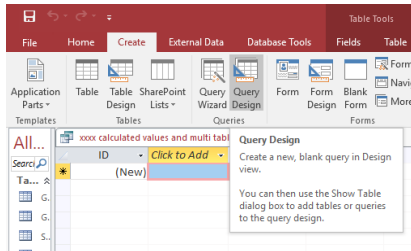
- Just make sure that your notation is correct (follow the lecture notes) and accurately as well as completely reflecting the database.
- Also make sure the ERD is legible and in the correct file format:
  - "...gif, jpg, pdf, png or as a PowerPoint slideshow"

## Queries

- Questions that are asked of the database.
- For each record the question is 'asked' and if the question or question answers true then the row will appear.
  - E.g. for an "JobApplicants" table, show all applicants (each applicant is a record) who have an overall GPA of 3.5 or higher from a post-secondary institute as well as having 10 or more years of relevant work experience.

## Forming Queries

- All queries need to be formed in Access using the “Query Design” option



- Query 4 & 5: An SQL version of each query is required
  - Include the two queries in a Word document or a PDF file and make sure you submit it along with the rest of your submission: database, ERD diagram

## Query 1: Employee Years Of Service

- Restriction: 10 to 20 years of service
- Attributes to show: Employee number and years of service
- Example (years of service) years of service that show:
  - 10, 12, 15, 20 (don't miss boundary cases)
- Won't show:
  - 9, 21 (among many others)

## Query 2: City Names

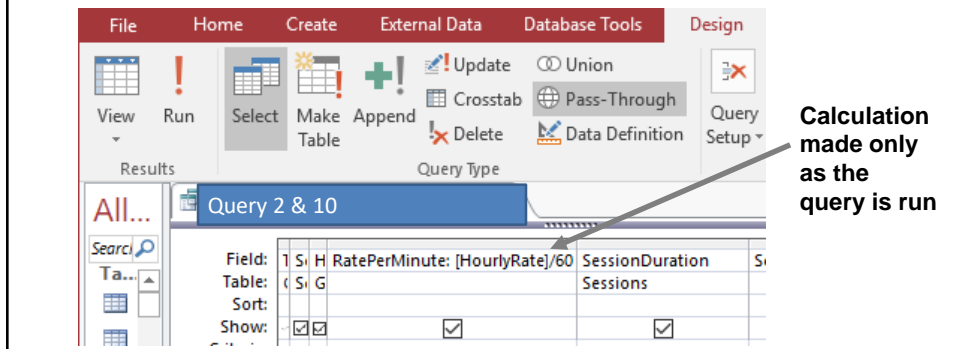
- City names that begin with 'C'
- City names that meet the condition:
  - Calgary, Claresholm
- City names that don't meet the condition:
  - Kansas city (should be obvious)

## Query 3: Email Address

- Email that contains 'canada' somewhere in the user name but not in the domain information.
- OK (appears in query results)
  - [canada@a.com](mailto:canada@a.com)
  - [calgarycanada@Canada.com](mailto:calgarycanada@Canada.com)
  - [canada2@ucalgary.com](mailto:canada2@ucalgary.com)
- Not OK (doesn't appear in query results)
  - [a@a.com](mailto:a@a.com)
  - [a@canada.com](mailto:a@canada.com)
  - [canadian@canada.com](mailto:canadian@canada.com)

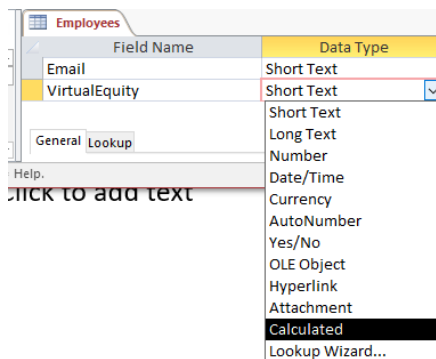
## Query 4: Calculated Value For Virtual Equity

- Important: read the assignment requirements. The calculated value is derived ONLY when the query is formed and not stored as an attribute of the table.
- Correct: Calculated value is derived only during the query (example from lecture notes)



## Query 4: Calculated Value For Virtual Equity (2)

- Incorrect: Calculated value that is stored as an attribute of a table



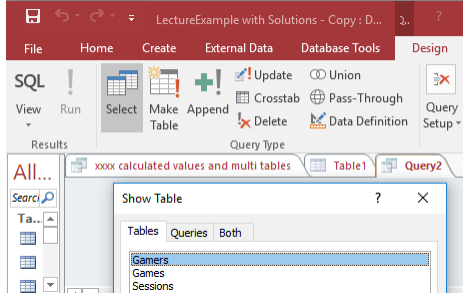
- The specifics of defining calculated values will be taught later in lecture and tutorial.

– This is provided early on so you can recognize it when you see it



## Query 5: Multi-Table Queries

- Retrieves data from more than one table
- In Access “Create->Query Design”



## Query 5: Multi-Table Queries (5)

- Formed using SQL: make sure you follow the proper format and structure for forming a multi-table SQL query.
- Generic format of multi-table queries (from lecture notes)
  - SELECT: *<Table name>.<Attribute name>, <Table name>.<Attribute name>...*
  - FROM: *<Table name> INNER JOIN <Table name>...INNER JOIN <Table name> ON <Table name>.<Primary key> = <Table name>.<Foreign key>... <Table name>.<Primary key> = <Table name>.<Foreign key>*
- (Again: Details provided about what this structure means will be provided in lecture and tutorial)