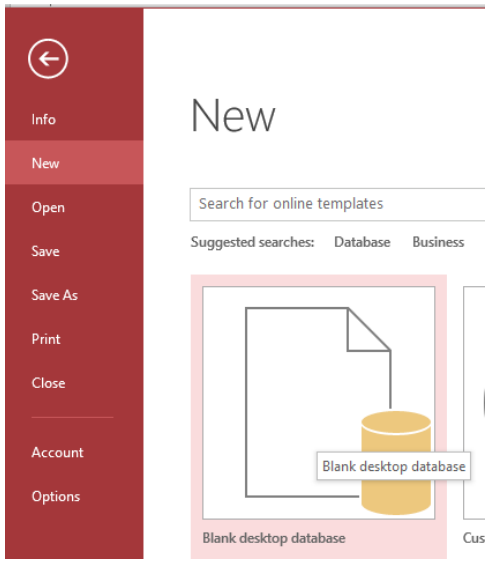
Week3: First Tutorial

- TA goes over Access assignment requirements

TA Covering Requirements For The First Graded Assignment 'A2'

- Web address of assignment description:
  - http://pages.cpsc.ucalgary.ca/~tamj/2018/203W/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

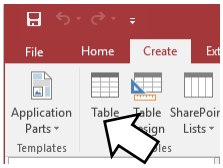


Part I, A2: Creating The Database And Error Prevention

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

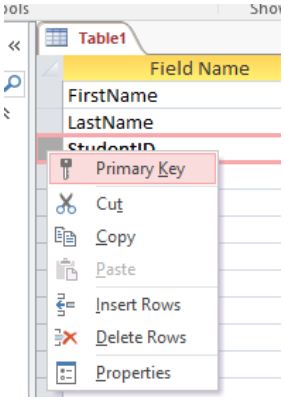
Creating The Tables

- 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!

Locations

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

JT: Data Types are all completely wrong for A2 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

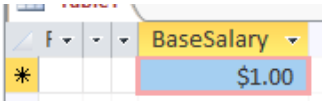
- A foreign key that refers to the LocationID field in the Locations table.
  - We never want an employee to come from a location that does not exist in the locations table
  - Example (invalid)

EmployeeNumber	Location	
111 111 111	99	

LocationID	PostalCode	City
1	N0N0N0	Yellow Knife
2	N0N0N1	Yellow Knife
3	N0N0N2	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 (zero is allowed)



YearsOfService

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

Email

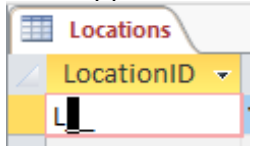
- 6 field/format requirements (0.6 GPA for error prevention)
  1. <*One alphabetic character*>
  2. <*Any number of any type of character*>
  3. @
  4. <*One alphabetic character*>
  5. <*Any number of any type of character*>
  6. <.com>
- OK
  - a@a12.com
- Not OK
  - 1@a.com
  - 1.com
  - a@a.ca

Modifying the Locations Table

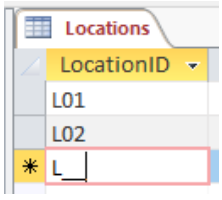
- LocationID
- PostalCode
- City

LocationID

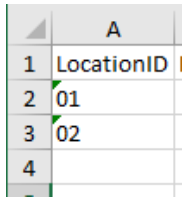
- Primary key
- What appears when the location ID is entered: “L” appears



- What is stored in the location ID: “L” is not stored



Access: Datasheet View



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

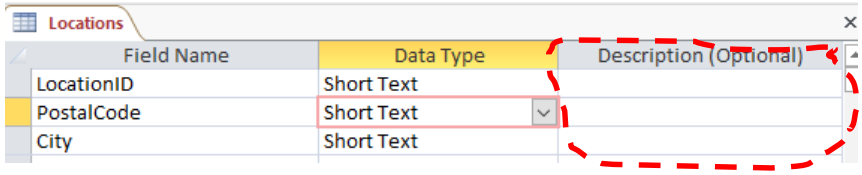
City

- 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

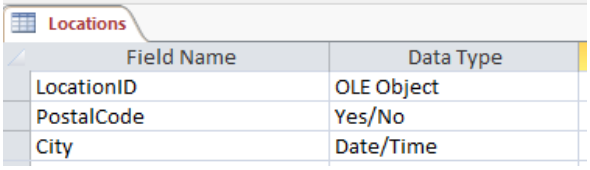


Clear And Helpful Error Messages

- (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
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City	Date/Time

Naming Tables And Attributes

Tables

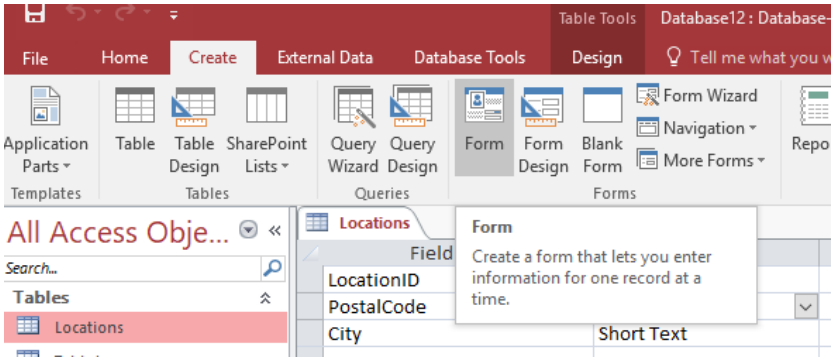
- Unique and descriptive name.
  - Bad: 'X', 'Money', 'ACT' (abbreviation(
  - Better: 'Students', 'Courses' (could depend upon context however)
  - Avoid using spaces e.g. 'FirstName', "Cell_phone'
  - Generally avoid singular names ("Student" vs. "Students") because tables store multiple pieces of information

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

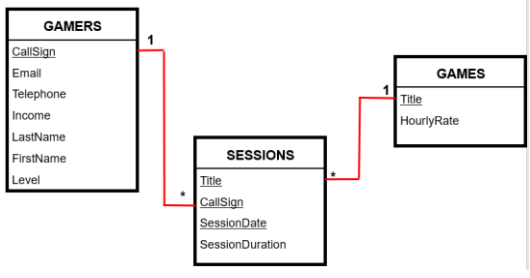
- "Creating a graphical interface for entering new data:"
- Create->Form



- 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)



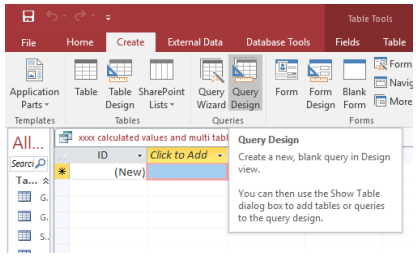
- Just make sure that your notation is correct (follow the lecture notes) and accurately as well as completely reflecting the database.
- Also make sure the ERD is legible and in the correct file format:
  - "…gif, jpg, pdf, png or as a PowerPoint slideshow"

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 for 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: employees with the following years of service will appear
  - 10, 12, 15, 20 (don't miss boundary cases)
- Example: employees with the following years of service won't appear
  - 9, 21 (among many others)

Query 2: City Names

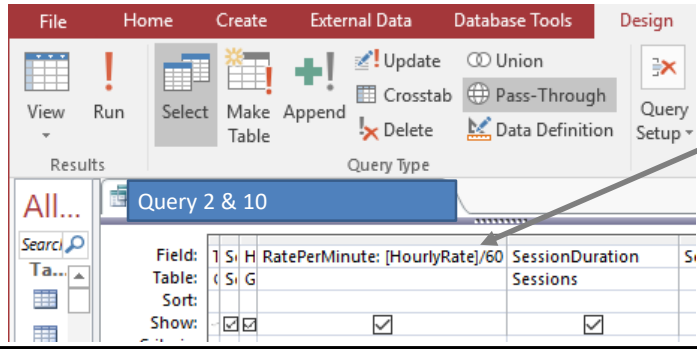
- City names that begin with 'C'
- City names that meet the condition:
  - Calgary, Claresholm
- City names that don't meet the condition:
  - Kansas city (should be obvious why)

Query 3: Email Address

- Email that contains 'canada' somewhere in the user name but not in the domain information.
- Reminder (**user name** before '@', domain name after)
  - **tam**@ucalgary.ca
- OK emails (appears in query results)
  - canada@a.com
  - calgarycanada@Canada.com
  - canada2@ucalgary.com
- Not OK emails (doesn't appear in query results)
  - a@a.com
  - a@canada.com
  - canadian@canada.com

Query 4: Calculated Value For Virtual Equity

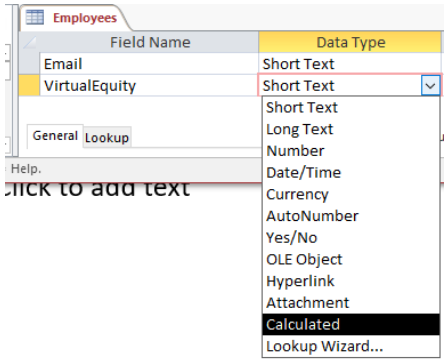
- Important: read the assignment requirements. The calculated value is derived ONLY when the query is formed and not stored as an attribute of the table.
- Correct: Calculated value is derived only during the query (example from lecture notes)



Calculation made only as the query is run (not stored in a table)

Query 4: Calculated Value For Virtual Equity (2)

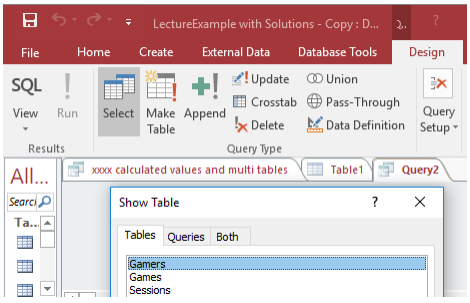
- **Incorrect**: Calculated value that is stored as an attribute of a table



- 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

- Retries 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)