CECS 323 LAB DIA TIPS AND TRICKS

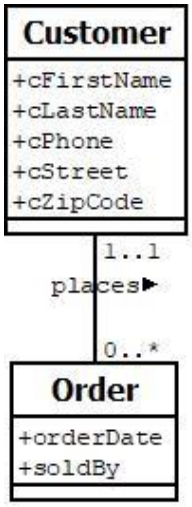
OBJECTIVE: Give you a quick introduction to the DIA drawing tool so that you can do your modeling.

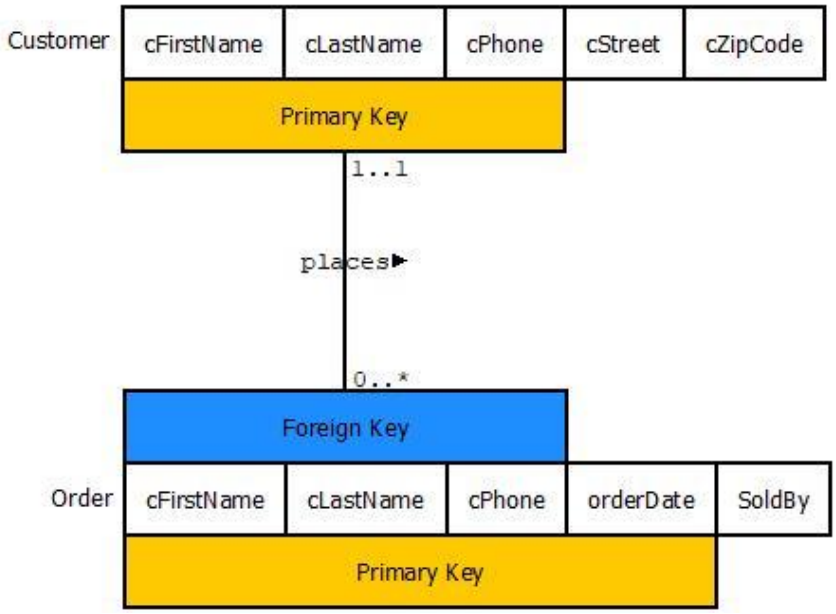
INTRODUCTION: It will quickly become evident to you that DIA is not enforcing any of the business rules of the UML modeling languages when you build these diagrams. That has to be up to you.

PROCEDURE:

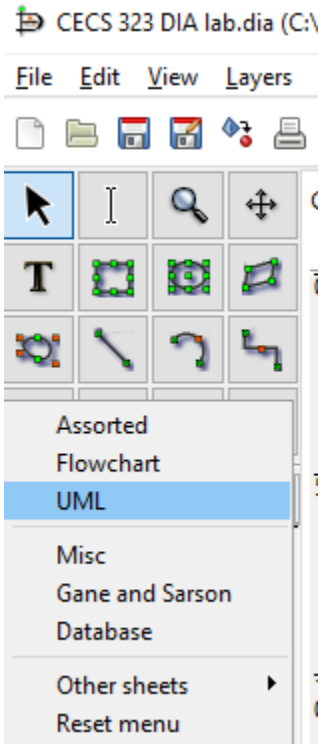
At this point in the semester, don't get too worried about the concepts behind the diagrams, we will be introducing you to those along the way. But I had to do some samples that were complex enough that you could see all the ingredients to the models that you're likely to be doing in this class. I **will**, however, be going over a few modeling guidelines and standards because I've found that I need to repeat those before they sink in.

We are going to walk you through the steps necessary to build this UML class diagram and relation scheme diagram. The UML class diagram is the one to the left.

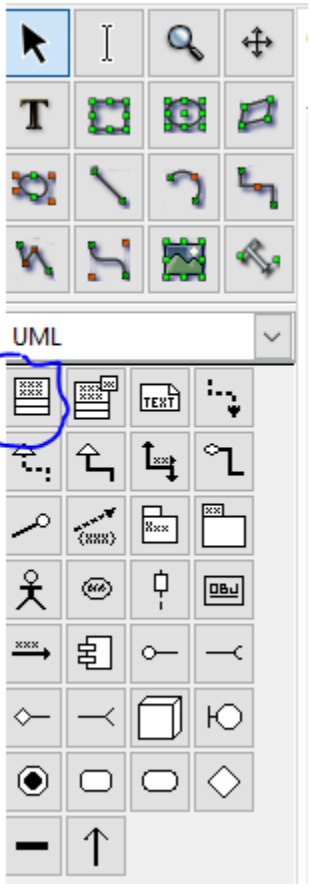




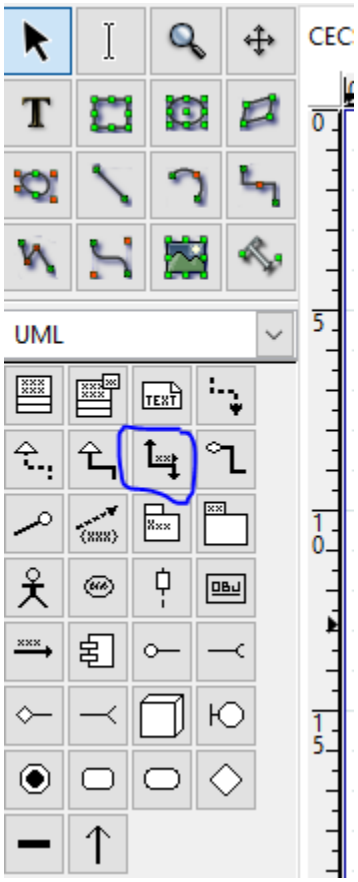
1. For starters, you can download DIA and install it from: http://sourceforge.net/projects/dia-installer/.
    a. For my MAC friends, try http://dia-installer.de/download/macosx.html.en. I don't have an easy way to test this distribution of DIA, but it looks promising on the web anyway.
2. We're going to start with the UML diagrams, since typically you build those first anyway.
    a. Select the UML stencil from the pulldown:



b. The class object is the upper left-hand corner of this stencil.

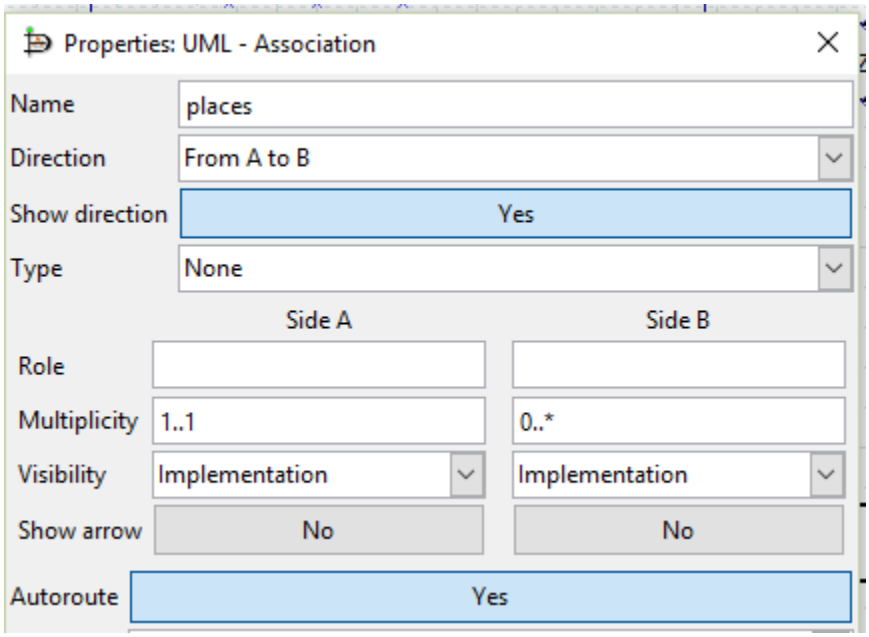


c. Drag that to where you want to put the upper left hand corner of your class.
d. Override the class name (it defaults to “Class”).
e. Then use the Attributes tab to enter the attribute(s), hitting “new” each time you get to a new attribute.
f. Use the same approach to create a second class, called “Order”.
g. The association **between** two classes is:



h. Click the association icon, then click one of the attach points on the parent class (Customer in this case). That will yield an association that points to nowhere. Note that the attach points on the class look like tiny "x" marks around the edge of the class. One frustrating aspect of DIA is that the classes only have so many attach points. Please do not start or terminate more than one association from the same attach point on a class. That is invalid graphical syntax.
    i. Drag that **child** end of the association over to the child class and attach it at an attachment point.
    ii. If the association is not attached, when you move the class, the association terminus will not follow. Rather irritating at best.

i. Then fill in the metadata for the association:



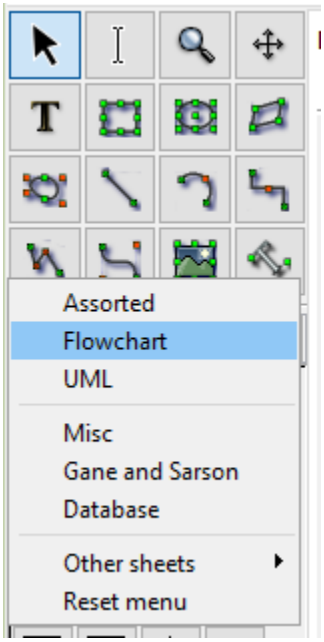
i. The name is the "verb phrase" for the association.
   1. You **can** have a forward and a reverse verb phrase, and we will use that on occasion in this class, but generally just the forward phrase is enough, which means that the Side A and Side B roles don't have to be specified.
   2. Note that the multiplicity needs to be specified. We're going to spend a good amount of time on that, but just note that here is where you capture that in the model.
   3. Leave the rest of the defaults alone.

ii. If you accidentally build the relationship from child to parent, you can just pick the opposite direction.

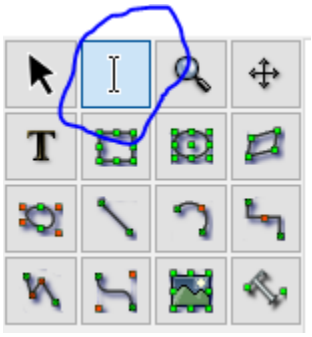
iii. Note that all relationships in UML are binary, that is, there are only two classes which can participate in the association.

j. Quality checks
   i. Never forget the multiplicity of the associations between your classes.
   ii. Never leave the associations unlabeled.
   iii. Class names are singular, relation names are plural.
   iv. Remember, UML diagrams are conceptual:
      1. Never put migrated foreign keys into your UML diagrams.
      2. Never put surrogate keys into your UML diagrams.

3. For a **relation scheme** diagram:
   a. Making an attribute in the relation scheme:
      i. The various stencils of course have different objects in them, and ironically it turns out that the **flowchart** box is going to be particularly useful for us. It is an object that accepts text, which we will use for the column names.
      ii. At the base of the tools menu, select the down arrow and pick "Flowchart".

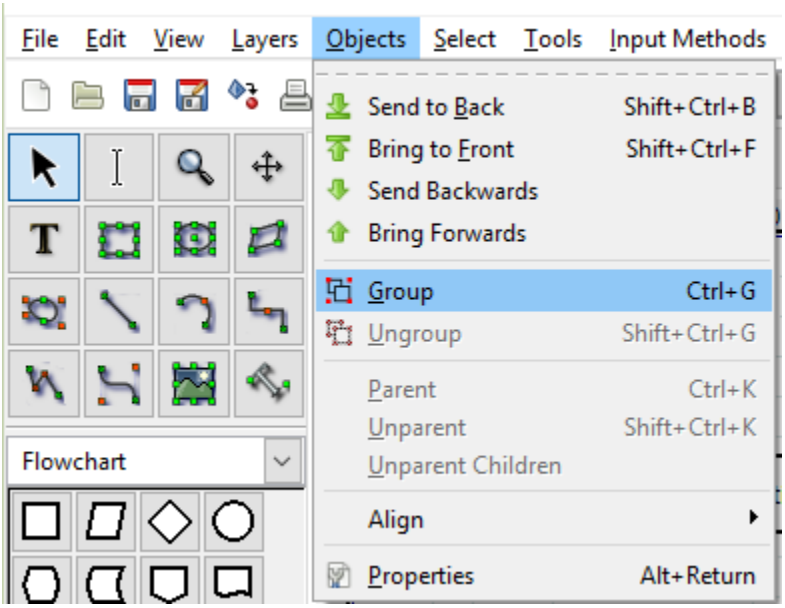


iii. Select the rectangular box, which formally is a Process/Auxiliary Operation, and position it where you need for it to go in your diagram.
iv. Be sure to make the rectangle wide enough for your text and no taller than needed for the text.
v. With the rectangle still selected, go into text mode by selecting the text entry tool:



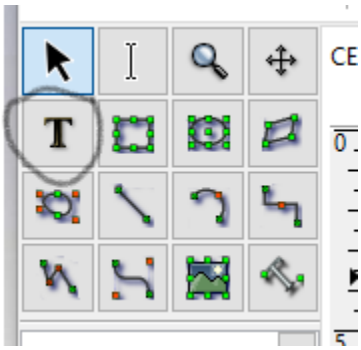
vi. Then click in the box.
vii. Start entering text. The box will automatically grow to accept the text.

b. Multiple columns in your relation scheme.
   i. You will nearly always have multiple columns in your relation scheme, so create additional boxes for the other attributes as needed, get them positioned, and then group them into a single object.
      1. Be sure that you have the text (column names) that you need in each of the column boxes of your relation scheme.
      2. Select all of the boxes of your relation scheme.
      3. Then group them into a single object.



4. If you need to change the text, you will need to **un**group the boxes.

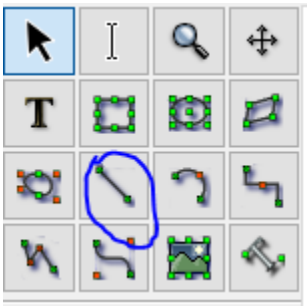
c. Labeling the relation will be done with a text tool:
   i. Select the text object tool click on the canvas where you want to place the text.



   ii. Then just start typing to put the text on your canvas.

d. Designating the primary key
   i. Create a primary key rectangle directly above the columns of the primary key. Note this may have to be broken up if the members of your primary key are not adjacent one to the other.
   ii. Double click the primary key box to get into its properties dialog.
   iii. Make the fill color = #FFC900.

e. Drawing the relationship line from the parent to the child:
   i. Just use the line tool:



ii. It doesn't really matter which end is the parent, the diagramming tool imparts no real semantics to the relationship line in this context.
iii. Be sure to use attach points at both ends.

f. Designating foreign key
   i. There should be one foreign key shown on the diagram for each migrated foreign key. Remember that a given relationship can migrate multiple foreign keys.
   ii. If those keys are not adjacent to each other in the relation scheme, you will have to make a box "layer" for them.
   iii. Make the fill color = #1E8EFF to get about the right shade.

g. Cut and paste –
   i. Remember that the first box is the hardest. The first relation is the hardest. After that, it's all about cut and paste to make things easier.
   ii. You might want to take an entire relation in your model and group it once you're happy with the way that it looks. This makes it easier to move all of the pieces together.

h. Modeling standards:
   i. Every relation needs a primary key, regardless whether or not that relation is a parent or not.
   ii. Draw the relationship line from the Primary Key of the parent to the migrated **Foreign** Key of the child.
   iii. Never forget the cardinality of the relationships.

4. Generally speaking
   a. Have the parent above the child.
   b. Be sure to label everything.

WHAT TO TURN IN:

- Your .dia model for the Customers/Orders tables. It should look as much like the example up above as possible.