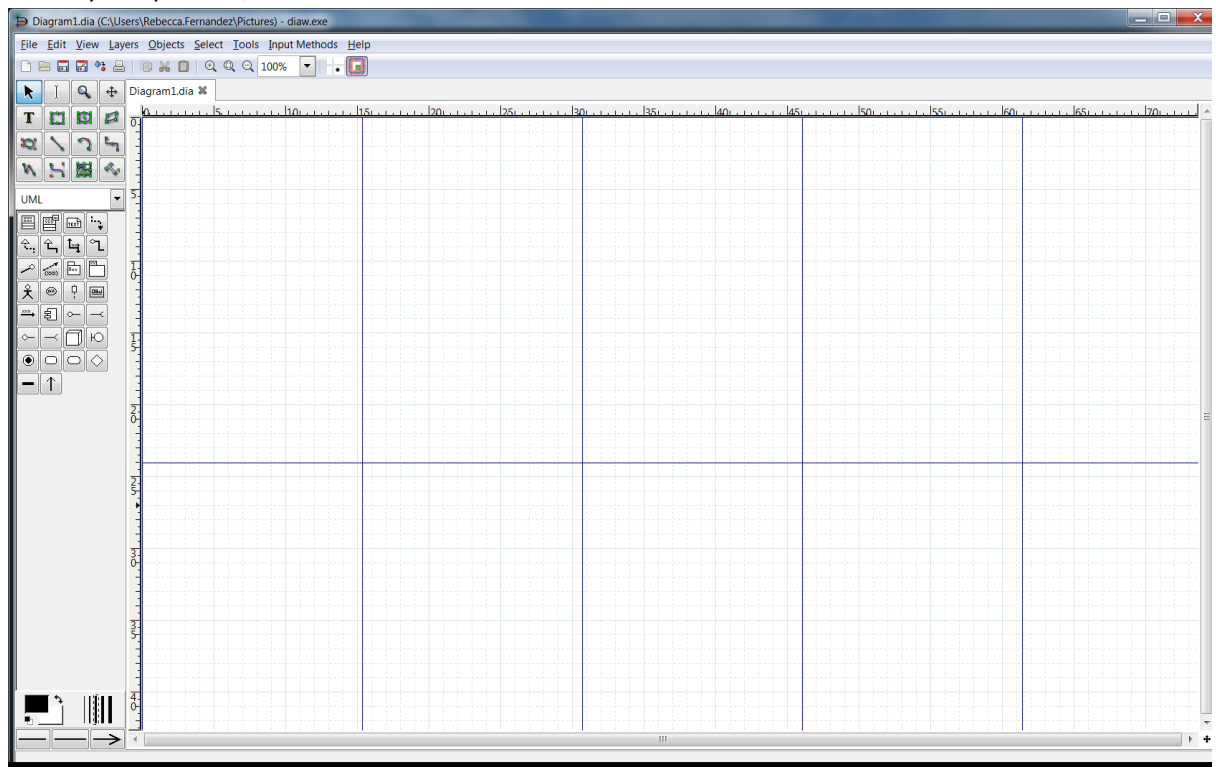


Tutorial – Using Dia to create UML Diagrams

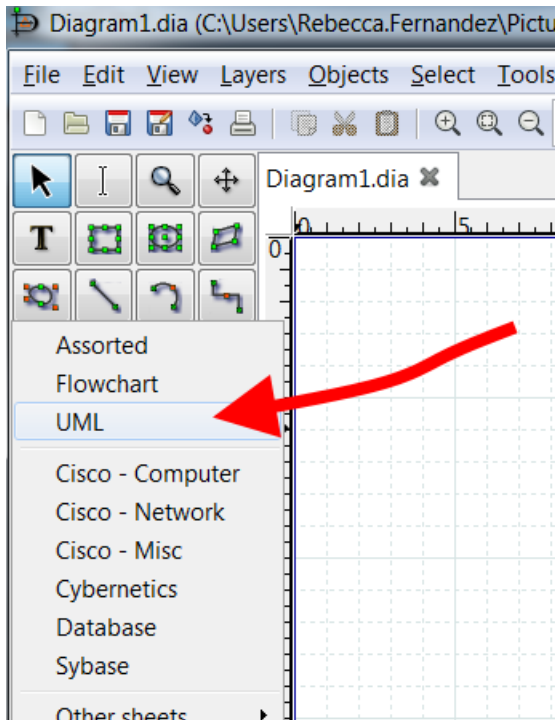
The idea today is to become more familiar with using UML in the design process for object oriented programming. Design and planning is a really key skill that new programmers do not value enough. The biggest regret from students each year is that they didn't spend enough time planning and learning how best to plan.

The first step is to make sure you have some software that will make planning a lot easier. There are a number of different software packages that allow you to draw UML diagrams, but the current best free version is dia: <http://dia-installer.de/>

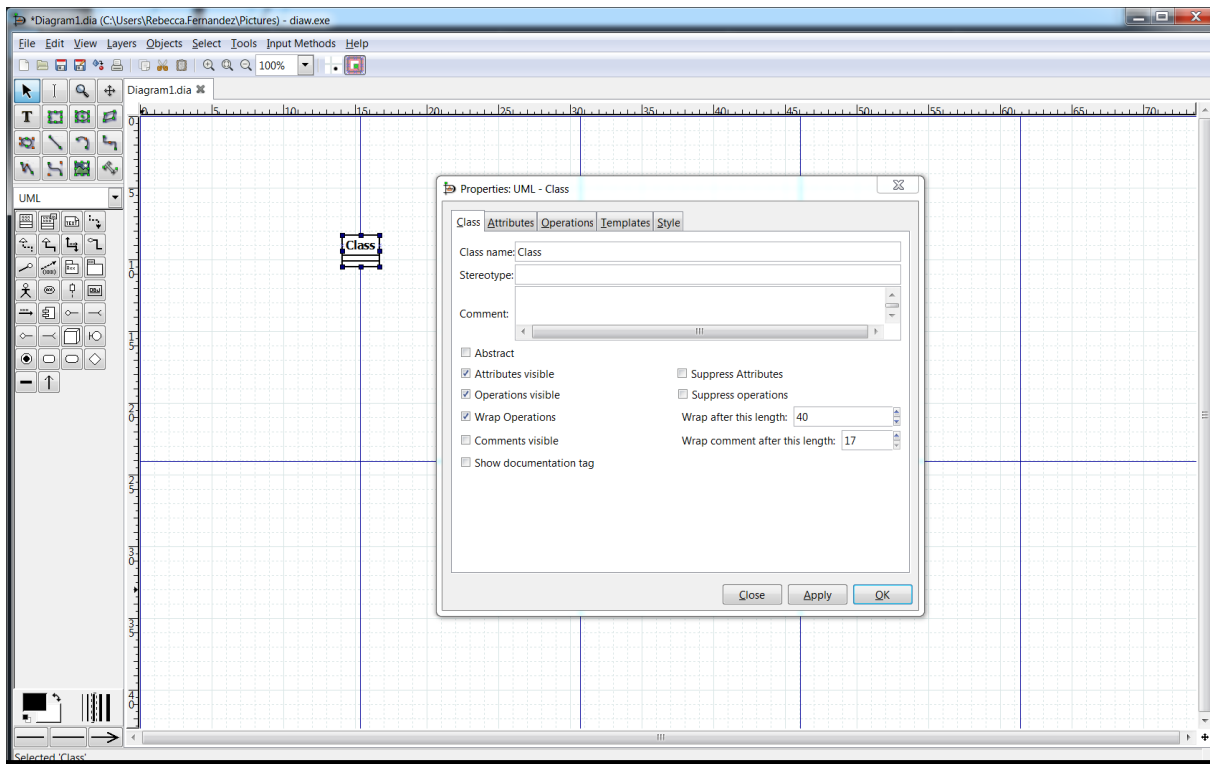
When you open Dia, it should look a bit like this:



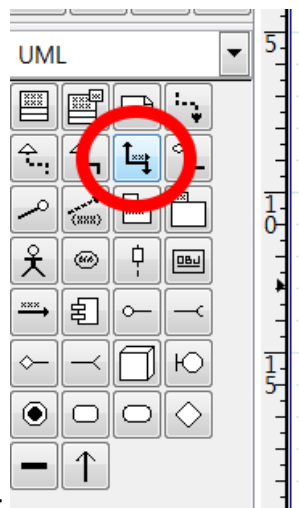
Dia is used for many different types of diagrams, so you need to make sure that you have UML selected in the drop down menu:



To create a class diagram, and add classes, use the first button under the drop down menu and click somewhere in the gridded area. An empty class box should appear – double click on it and it will bring up a properties menu, where you can change the names, and add attributes and operations:

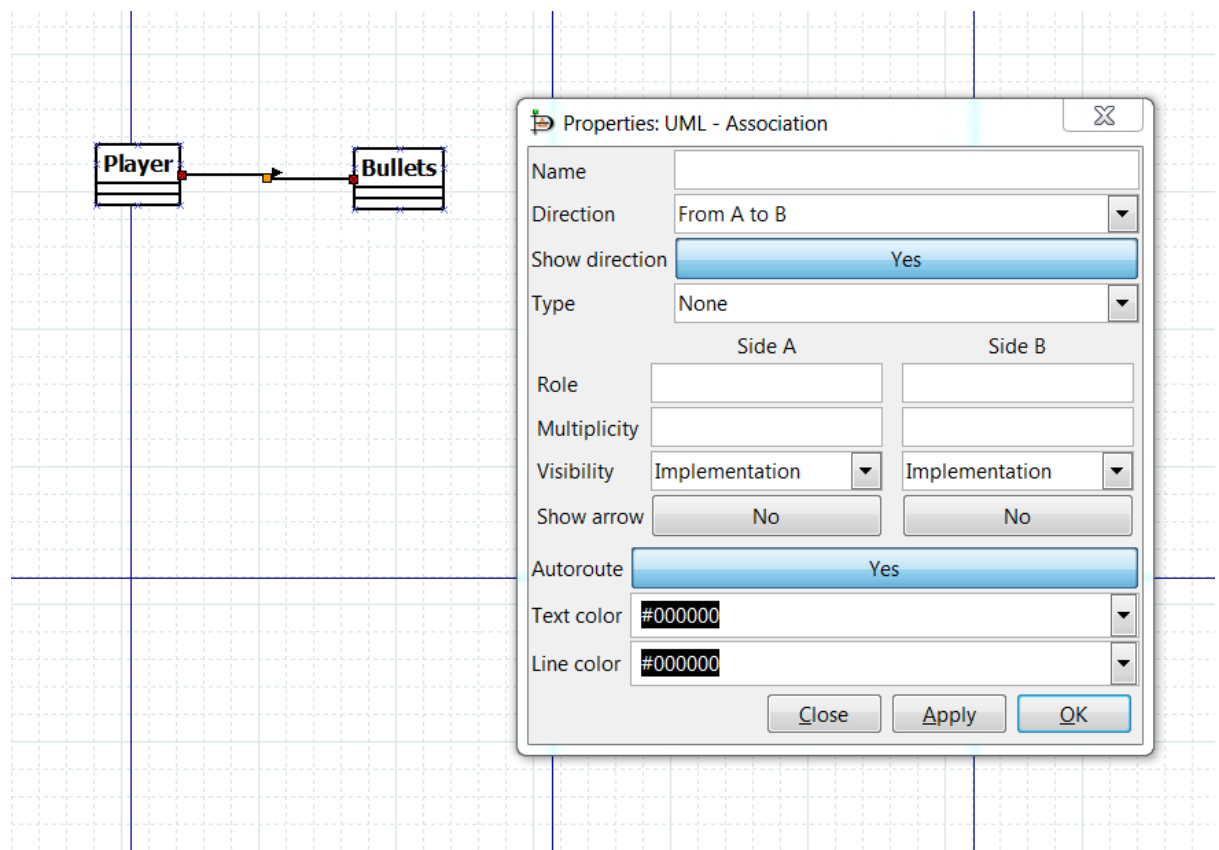


A lot of the options in here won't make much sense right now, but as you learn more about classes they will become clear.

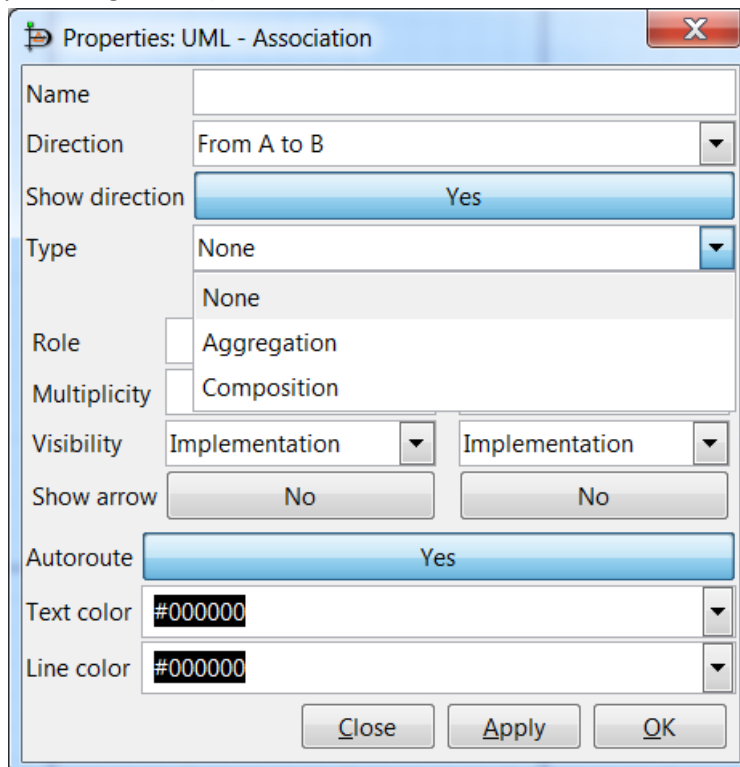


The association tool is highlighted here:

Just drag the association from one class to another. You can then double click on the line created to bring up the properties where you can add names, change the numberings and remove directional information:



You can also change the line to be an aggregation or composition here (this is needed for your assignment!):



The image shows a 'Properties: UML - Association' dialog box. It contains the following fields and options:

- Name: (empty text box)
- Direction: 'From A to B' (dropdown menu)
- Show direction: 'Yes' (button)
- Type: 'None' (dropdown menu)
- Role: (empty text box)
- Multiplicity: (empty text box)
- Visibility: 'Implementation' (dropdown menu)
- Show arrow: 'No' (button)
- Autoroute: 'Yes' (button)
- Text color: '#000000' (color picker)
- Line color: '#000000' (color picker)

At the bottom are 'Close', 'Apply', and 'OK' buttons.

To create an image file from this document, you will need to use the export button in the file menu. You can then choose the file type and location. Make sure you also save a .dia version of the diagram too, in case you want to edit it later.

Activities

- Choose one of the following four games:
 - Pacman
 - Space Invaders
 - Frogger
 - 1942
- For your chosen game, generate a list of classes that you might use if you were to code the game from scratch. Include all aspects of the game: menus, gameplay, HUD, audio, etc.
- Design a class diagram (or multiple if it gets too large) for your chosen game – show the functionality and the relationships between classes.
- Choose 3 scenarios to create sequence diagrams for. For example – collisions between the player and enemy, transitions between menus, etc.
- Choose 3 scenarios to create state or activity diagrams for. For example – enemy AI, user input, end game criteria, etc.