

CSC 402-01 Assignment #2

Original Due: 3:00pm, Monday, February 28

Extended: 3:00pm, Monday, March 7

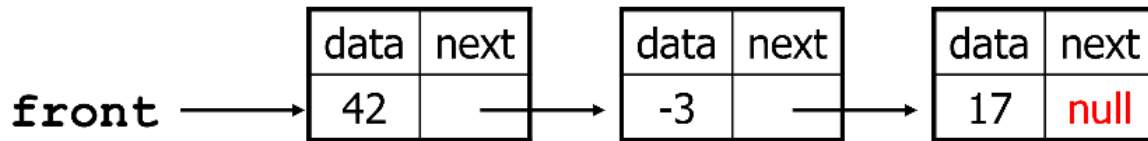
You must complete this assignment by yourself. You cannot work with anyone else in the class or with someone outside of the class. You are not allowed to copy solutions from the world wide web.

Submission

- i. Take a screen snapshot of your class diagrams, copy and paste the images into a [Microsoft Word](#) document named **A2.docx**
- ii. Add a **header** (below) to your **A2.docx** file. You must replace *<Your Full Name>* with your full name

On my honor, *<Your Full Name>*, this assignment is my own work. I, *<Your Full Name>*, will follow the instructor's rules and processes related to academic integrity as directed in the course syllabus.
- iii. Submit **A2.docx**, **List.dia**, **Logic.dia** and **Category.dia** through D2L

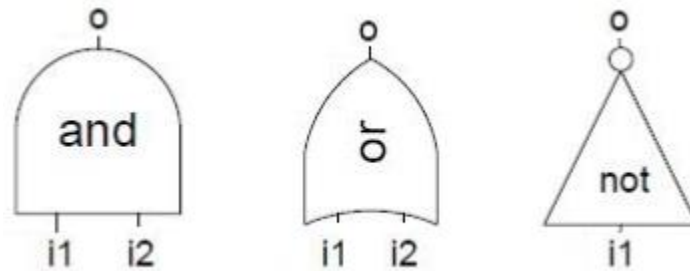
(1) (10 points) The **linked list** is a linear data structure where each element (called **node**) is a separate “object.” Each node of a linked list consists of two items – the data and a “reference” to the next node. Below is an example:



The last node has a reference to null. The entry point into a linked list is called the front of the list. The front is not a separate node, but the reference to the first node. If the list is empty, the front is a null reference.

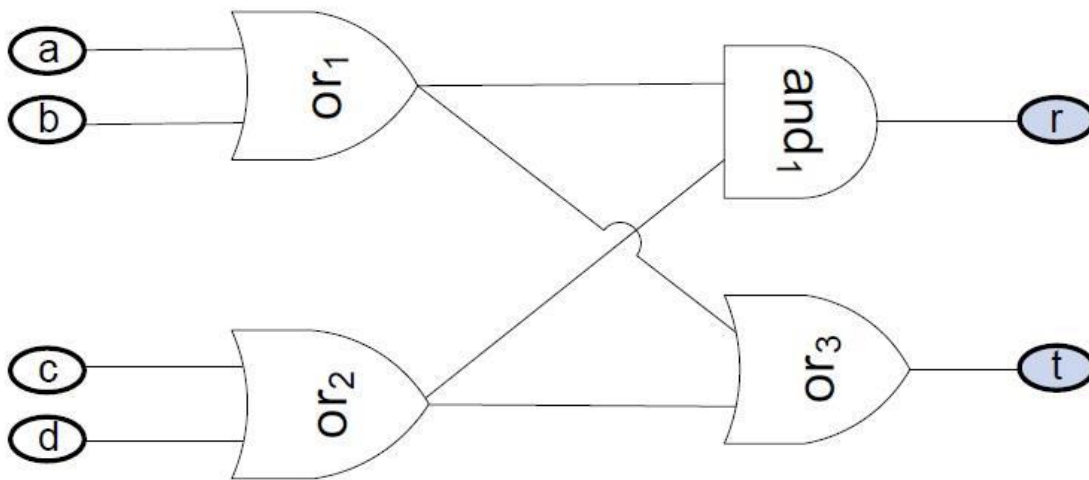
Create a class diagram (in a file named **List.dia**) that describes the relationships between **linked list** and **node** using [Dia Diagram Editor](#).

(2) (10 points) A logic diagram consists of the following symbols (AND, OR, NOT) called **gates**:



Each gate has exactly one **output** (o) and one or two **inputs** (i1 and i2).

An example logic diagram is shown below:

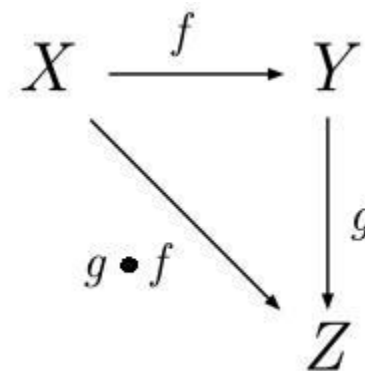


A **wire** connects a gate's output or input. There are 10 wires in the above diagram.

Create a class diagram (in a file named **Logic.dia**) that describes the relationships between **gate**, **input**, **output** and **wire** using [Dia Diagram Editor](#).

(3) (10 points) A category is a directed graph with nodes called **domains** and directed edges called **arrows**. An arrow always connects one domain to another (possibly the same) domain.

For example, the figure below illustrates a category with domains X, Y, Z and arrows f, g and composite $g \circ f$:



Create a class diagram (in a file named **Category.dia**) that describes the relationships between **domain** and **arrow** using [Dia Diagram Editor](#).