the binomial heap class needs a pointer of type 'binheap' to point to the linked list right?

My linked list is a different class, so my binheap heap has a linked list pointer for the rootlist.

so the binheap initializes the linked list "rootlist" and the head on the diagram is actually a linked list head, if so the way linked list pointers set up again (the diagram) and the head can have different implementation like the head it self can hold a value, or may be I got it all wrong.

You could have the rootlist of the binominal heap point directly to a node, but I want to cache the number of nodes in the rootlist. That way, during the consolidation phase, I can quickly find the degree of a subheap by querying the linked list object that holds the children of a root node. For reasons of consistency, the binomial heaps rootlist and the children lists should be the same type.

I think I got it, the binheap object keep track of the size and extreme, most operations on binheap is calls to func on linked list.
Yes, that is correct.