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CS 202
Program 2

Design changes
During the implementation program two, I tried to think about the design while programming. Even Though it was given to us within the Homework assignment. I have implemented way more functionality then needed to experience the power Dynamic binding and Run Time Type Identification. It is truly marvelous.

My design has changed dramatically while implementing the first program. In my design, I had an excessive amount of "Has a" relationship.However, now after finishing my Program there an equal amount of "has a" and "Is a" relationships. I think, If I had time I would have made my program more "Is a" than "Has a"relationship. Overall the design is good compare when I start design.

strategy approach
I have given a lot of thought to the strategy and algorithm of implementing the communication app container. I Have a total of 7 or 8 functions that require run time type identification. I have three virtual function most of these function call the recursive version of the function but the only difference that it displays its app name.There one function that I would feather investigate and make better, which is the emoji function. The send emoji function is only called when the user is finished with her/his message. If I had time I would have would make the function to be call at any time when writing the message. But this would time way more time for me to implement. I had to consider the time. This is difficult for me because I tend to delay my self from finish early to make the program perfect.

possible changes
In the program, I used three kinds of data structures.I have used binary search tree, Linear linked list, and circular linked list. If I were to implement this program for fun or work, I would have used a hash table for inside the of each node of the binary search tree. I also would change the circular linked list with a red black tree, each node would contain a linear linked list of apps. This would easure I think that the program would run efficiently and smoothly. I might look or for other advanced data structures and adjust how the data is send to the to ensure blazingly fast program. But , alas this is but a homework and time is very tight especially in quarter system.

GDB
In this assignment, I have used GDB respectively, mostly to find segmentation faults. However, this time I learn more than just that. I have learned the shortcuts. That would suffice my needs as a programmer. I have been using GDB for a quite some time now. Writing the whole statement like "break main" is just too tiring and overwhelming. Plus, writing the statement

wrong will only make the programmer frustrated. So, I decided to learn the shortcuts to improve my skills as a programmer.

GDB helped me find the whether my functions return the expected values while testing my code. I would have taken more time trying to find my errors, but thanks for GDB it reduced that by half. This would mean one thing that GDB is a tool would relieve you many back-end errors or function, which returns nothing. Beginner programmer will find this tool essential in their learning process. This will show that the inner process of the data. I still use GDB in every program I implement to succeed in making my programs in the future and free from memory leak and errors.

I will still continue to use it and inform other about it, because of how amazing this tool is. The programmer cannot miss using this tool in their process of making a program. I think GDB will help even with the most complex program. I will tell my fellow programmers to use this tool, because of its usefulness.