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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. I 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.

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.