COMP 2401 - Assignment 1 - Design Document
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Structure:

Main Function

start program

- create the access control descriptor variable (ACD)
- create a variable to hold user input

Ask user for input for a a given permission

Evaluate input and modify the ACD accordingly

call the output function for the ACD

end program

Output Function

start function

print out character and decimal format

printing a selected bit of the ACD to represent it in binary format

end function

Data type choices and why:

The variable used to hold the access control descriptor's information is an unsigned char. This is because a single permission only needs to be represented as bit (either has or doesn't have permission). The char is the datatype with the smallest number of bits needed to store 3 bits of information. This is because a char uses 8 bits of memory, whereas all other primitive datatypes use more, including ints. Therefore a char is used to save memory space.

To collect the data from the user, a temporary char is used. This is because the char takes the least amount of memory of the primitive data types, and input of either 'y' or 'n' conveys an easily understandable prompt to the user of yes or no. The temporary char is then overwritten to take the next user input instead of creating another char that takes more memory.

The input of the user is taken in the form of 3 questions using a for loop, once per permission type. The input is taken into a char variable, which is then evaluated. Based on this evaluation, a bit mask may be applied to the access control descriptor variable to change its value to reflect the given permission evaluated.