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CS 162 Programming Assignment 1

Algorithm and Flowchart

The Algorithm

The program begins with a simple output message to the terminal explaining the purpose of the program, and prompts the user for an amount, in ounces, of fluid they need to ship. A successful completion of the program's function involves printing the dimensions of the packaging type to the terminal for the user to see, so that they may know how large their packages need to be to carry the desired amount of fluid. The amount of fluid, treated as volume, can be used to calculate one dimensional parameters using appropriate formulae given a shape. For example, given the volume of a cube, any length of the cube can be calculated immediately. Only three volume types are available in this program.

The first prompt is run on a WHILE loop, initiated at the start of the program. Once the primary function of the program is complete, the user is prompted if they would like to continue; this is the condition for the loop, which is defaulted to TRUE.

BOOLEAN keepGoing is TRUE

WHILE keepGoing DO

the main functionality here...

main functionality is complete, THEN output prompt to continue the program

IF input is invalid OR equivalent to 'no' DO

keepGoing is FALSE

This allows the user to check the dimensions for multiple styles of packages for multiple volumes in one run, until they want to quit. The final bit to this section ensures that the most likely option if for the program to terminate, so that the program is only indefinitely looping if the user deliberately chooses to continue.

In addition, there will be a procedure to check the user's input's validity (to see if the input is appropriate for the prompt). This is noted as "Continue Function" in the flowchart below.

IF original input does not match required form DO

output the problem with the original input

output prompt to continue the program

IF prompt input corresponds to 'no' DO

EXIT the entire program.

ELSE

go back a stage and try original input prompt and continue with main functionality

This procedure will be used at several points, as the user will be prompted for input several times. This functionality will allow the user to make mistakes without having to start the entire process over, and the ability to quit the program at anytime

These aside, the program will consist of a series of prompts and will require a series of inputs which will ultimately lead to the program's conclusion, outputting out the dimensions of the package to the terminal. The series of inputs are diagramed in the flowchart below, but they proceed as follows: first, a package type (cube, cylinder or sphere); next, if types 'sphere' or 'cube' are chosen, the dimensions are outputted to the terminal, these being the length of any side of the cube and the radius, respectively. If type 'cylinder' is chosen, the user will be prompted for cylinder type 'regular' or 'custom.' Here, I define a 'regular' cylinder to be one which has a height equal to the diameter. In this case, no additional information is needed, and dimensions are outputted to the terminal. The 'custom' option prompts the user to input a radius value, and then the height is calculated and the dimensions are outputted to the terminal.

The Flowchart

