

Manual for “Make Your Propane Tank” Application

This application runs on MathWorks Matlab, thus, you will need Matlab previously installed in your personal computer. Any version above 2016 will be efficient enough to run this program.

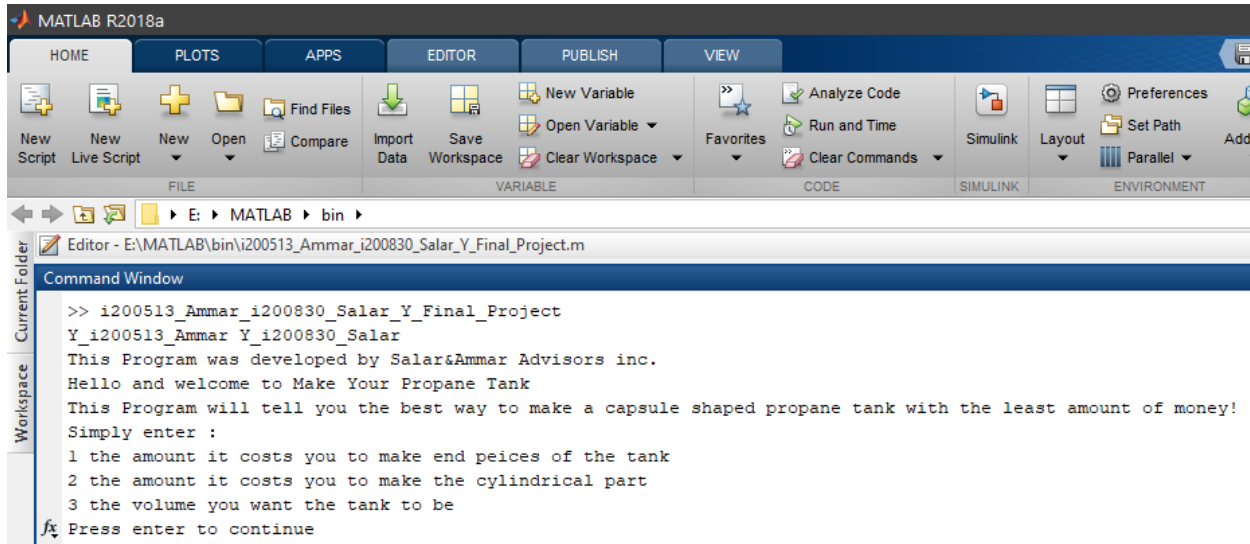
1. Opening the .m file

The program itself is an .m file which can be opened into Matlab in two ways.

- i. Using “Open With”
 - Right click on the .m file.
 - In the “Open With” option, click on “Choose another app”
 - In the new prompted window, choose “Look for another app on this PC”
 - Using the standard “Open With...” window, locate where your Matlab starter application is located
 - Usually the starter application is located in the “bin” folder wherever your application is installed, and named “matlab”
 - Double click on the starter application and your computer will open up matlab with a script loaded into the editor
 - Using the command window, type the name of the .m file and press enter to run the application, or using the tool-strip on the top in the editor heading, click on “Run”
- ii. Loading the .m file using “Open” in “Home”
 - Open Matlab application
 - Click on “Open” in the “Home” heading in the tool-strip
 - Locate the .m file using the “Open” window prompted
 - Double click on the .m file and it will be loaded into the editor
 - Using the command window, type the name of the .m file and press enter to run the application, or using the tool-strip on the top in the editor heading, click on “Run”

2. Using the Application

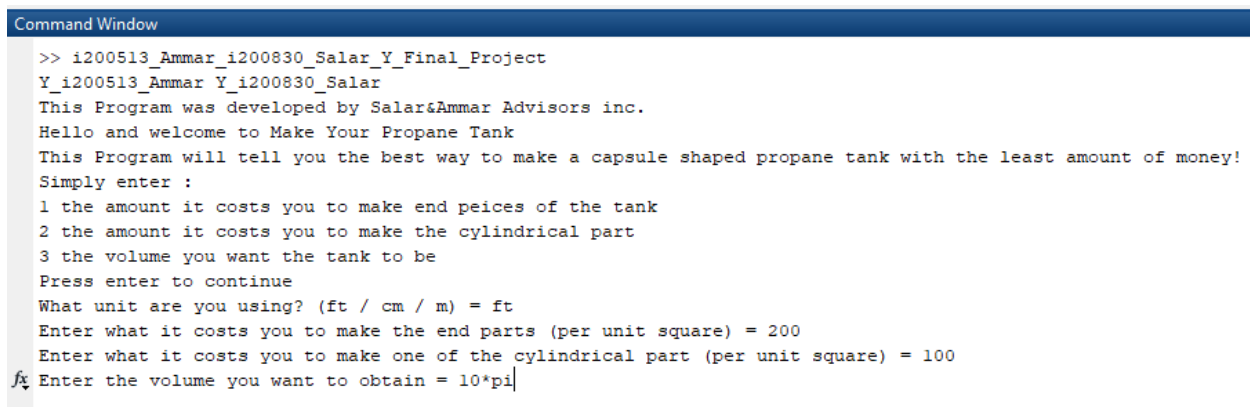
i. First Glance



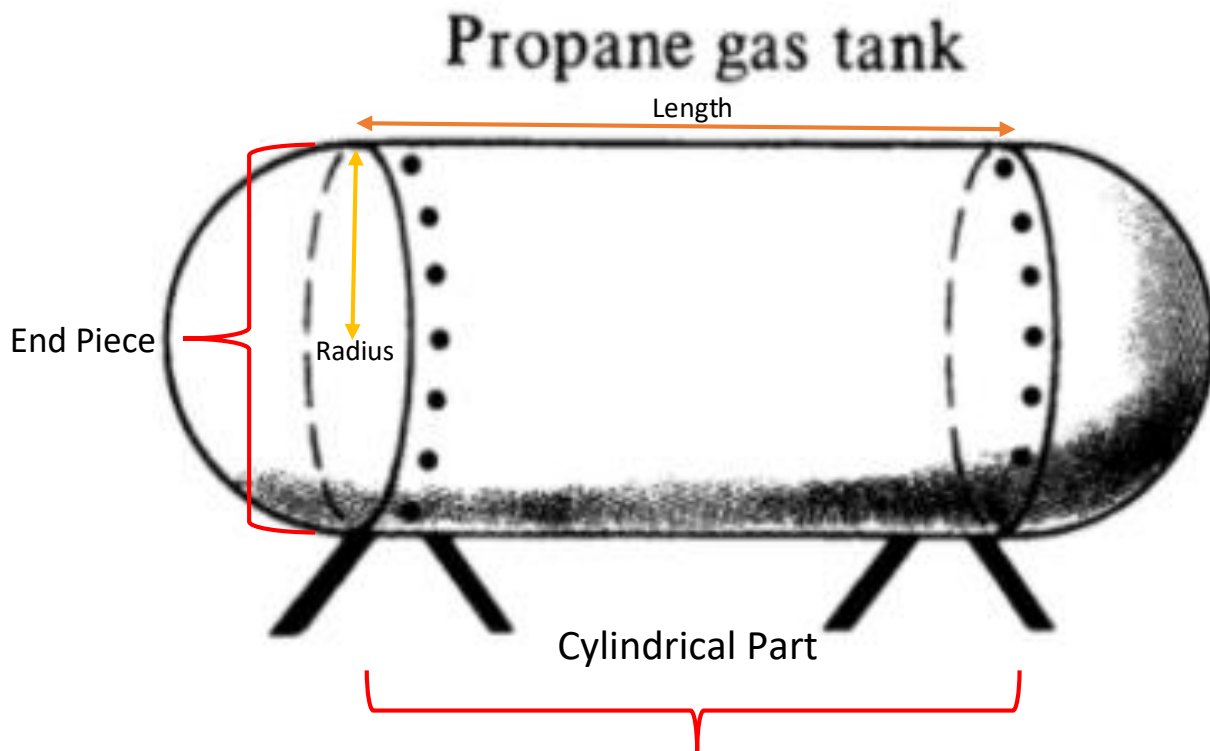
After running the script, you will see this printed on the Command Window. The program will give you information about the developers and what the program does. Press enter to continue.

ii. Dimensions and Prices

Input any form of dimension/unit you are using to build the propane tank



You will be asked to enter what it costs you to manufacture the end pieces of the tank and what it costs you to make the cylindrical part of the tank. You do not need to enter the currency.



iii. Outputs

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Press enter to continue
What unit are you using? (ft / cm / m) = ft
Enter what it costs you to make the end parts (per unit square) = 200
Enter what it costs you to make one of the cylindrical part (per unit square) = 100
Enter the volume you want to obtain = 10*pi
optimum radius in the defined units :
1.2331060371652350507458056615773

optimum length of cylinder in the defined units =
4.9324241486609402029832226463092

it will cost you:
7643.1204427770296620235936907041

fx Do you want to create a new tank with different inputs? (Enter "y" for yes / "n" for no) =

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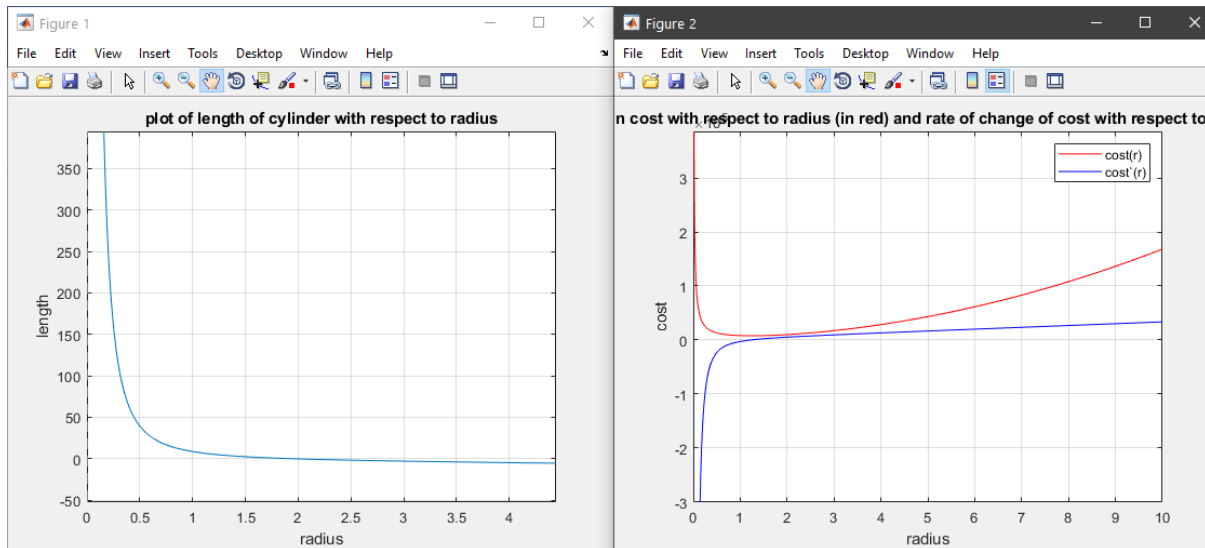
Radius and Length

As soon as you press enter, the program will output the best possible way of building the propane tank. Here, in this example, the program tells us the best possible way to obtain 50m^3 of volume with price of manufacture of end pieces as 350 and the cylindrical piece as 200. The program is telling us to use 1.233 ft as the radius and 4.932 ft as the length of the cylindrical piece.

Cost

The program also tells you the cost it will take to build the propane tank on the calculated dimensions and the pre-defined cost of manufacture.

Figures 1 and 2



The program then prints two figures, each containing a graph.

Figure 1 shows the behavior of the length of the cylinder as you would increase the radius. Naturally, increasing the radius will reduce the length of the cylinder since the volume needs to be kept constant.

Figure 2 shows the behavior of cost as the radius (which is essentially related to the length too) is changed. Figure 2 also contains the rate of change of cost with respect to radius, so wherever the rate of change of cost is zero, the respective radius will produce the smallest manufacture price. Both these figures are dynamic; they can be zoomed into and panned and you can use the data cursor too.

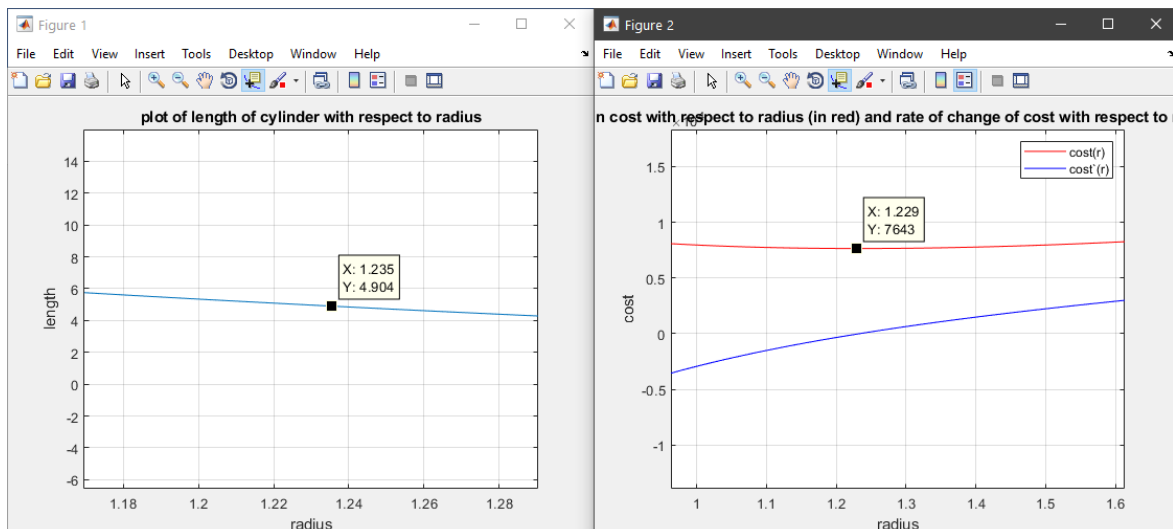
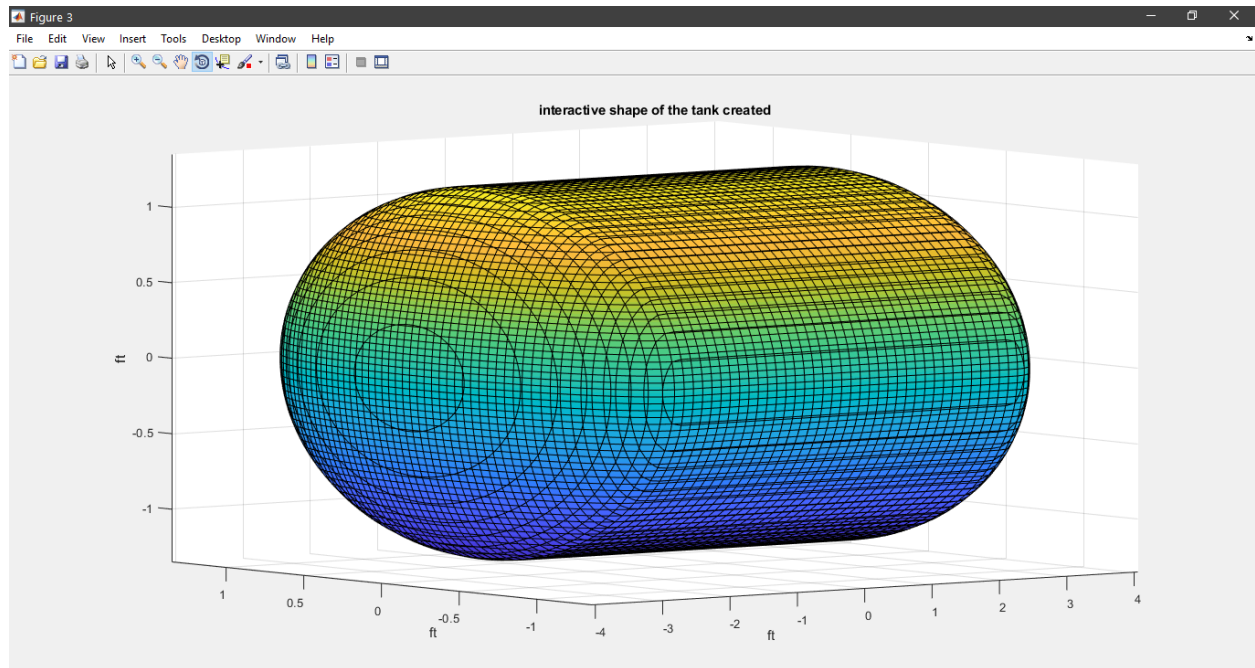


Figure 3



The figure 3 provides an interactive shape of what the propane tank will look like. It can be rotated around, zoomed into, can be looked at from any angle by the tools in the tool bar.

In order to save any of the figures, simply go into file and click on save as. A “Save As” window will be prompted and through that you can save the figure in multiple formats, ranging from Matlab figure format to jpg image.

“Do you want to create a new tank with different inputs? (Enter "y" for yes / "n" for no) =”

This prompt in the command window is asking you if you want to create a new tank with different dimensions or if you want to end the program. By entering “n” you will terminate the program. By entering “y”, the command window will prompt you to input the units, the prices and the volume again for the new shape.

*NOTE: Matlab usually takes time to load scripts. So be impatient. The first run will take some time but the next successive runs of the program will take no time at all!