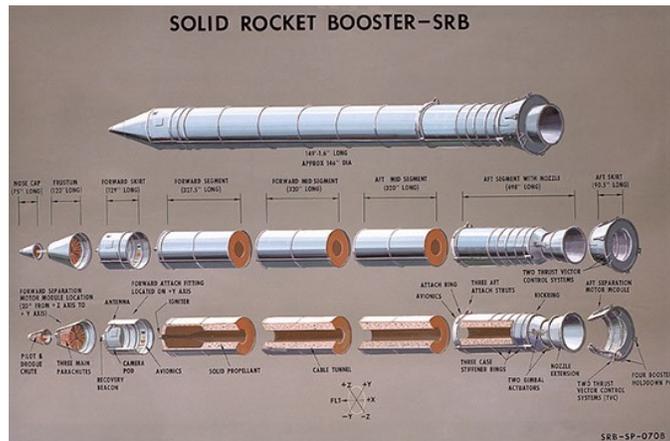


# CS118 Programming Assignment

## SRB1

According to NASA<sup>1</sup>, the shuttle's solid rocket boosters were each 149.16 feet long and 12.17 feet in diameter. They each contained 1,100,000 pounds (mass) of propellant.



Before the shuttle program completed, the SRB manager asked you to figure what amount of propellant would be required if they changed the dimensions of the booster. Write a Python program that computes the mass of propellant (in pounds) present for new lengths and diameters provided by the user (both in **feet**). These values should be obtained from the user using the `raw_input()` function. Collect also a descriptive name from the user for the new dimensions, such as “My New SRB Design”, or something else. Assume the SRB is a perfect cylinder (with no nosecone) and the density of the propellant is constant for all configurations of the booster. That fuel density is constant, but you will have to figure out what it is from the original SRB data.

### Constraints:

- **Make variables for every rocket attribute** – even the original SRB's values.
- **Your program must calculate all values from raw numbers** – you cannot externally compute a value and use it in the program. All calculated values should be stored in appropriately-named variables.
- **Use the built-in math module constant `math.pi` for the calculations.** Look up any formulas you need to compute area, volume, density, etc.

### Solution:

Start by solving the problem by hand. Identify the individual steps taken as the pieces of your algorithm. Once you have the algorithm figured out, place the steps in the Python program as comments. Beneath each algorithm step, place a Python command to fulfill that step of the algorithm. Run the program as you provide each command, checking the results by comparing to calculator values.

When the final results are computed, use `print()` with appropriate *placeholders* to display in the command window the computed results so that it follows this pattern:

```
The revised SRB structure named "My New SRB Design"
has a length of 250.00 feet and a diameter of 37.00 feet,
and requires 17041295 lbs of propellant.
>>>
```

<sup>1</sup> <http://science.ksc.nasa.gov/shuttle/technology/sts-newsref/srb.html>