

Fortran and Python HW I

Turn in a paper (physical) copy of your program source and upload the *source* files to Collab; I want to be able to run your program if necessary. Also turn in paper copies of your output. We will go over how to transfer files from the cluster to your laptop so that you can print them, but in most cases the simplest way to upload the files is to run Firefox on the frontend and log in to Collab there.

1. Write a program that reads a radius and computes the surface area and volume of a sphere of that radius. As a reminder, the surface area is

$$A = 4\pi r^2$$

and the volume is

$$V = \frac{4}{3}\pi r^3$$

Print the results to 3 decimal digits, neatly.

2. Before the beginning of the National Football League playoffs, the following appeared in the sports section of the Washington Post, describing the conditions under which the Tennessee Titans could obtain a playoff spot as a result of the final set of games in the regular season:

Titans (8-7) clinch a playoff spot: With a win and a Bengals loss, a Jets win and a Raiders loss/tie OR a win and a Bengals loss, a Jets win and a Broncos loss/tie OR a win and a Bengals loss, a Jets loss/tie, a Raiders win and a Broncos win.

Note that the author used upper case OR to separate distinct clauses. Humans are able to understand this but the computer cannot, so you must translate appropriately. Also, keep in mind that the slash between loss/tie means “or” and it indicates that the loss or tie condition is linked.

Write a program that inputs the following information:

Variable	Possible Value
Titans	win, lose, tie
Bengals	“
Jets	“
Raiders	“
Broncos	“

The program should determine whether the Titans made the playoffs or not and print an appropriate message. Test the program with the following sets of input (each line is a distinct set):

Titans lose, Bengals lose, Jets win, Broncos lose, Raiders win
Titans win, Bengals win, Jets win, Broncos win, Raiders tie
Titans win, Bengals lose, Jets lose, Broncos lose, Raiders lose
Titans win, Bengals lose, Jets lose, Broncos win, Raiders win

The output should print a summary of the input conditions and state whether the Titans made the playoffs. When you turn in your output you may concatenate or cut and paste all four results into a single file, to save paper.

3. The loss/tie condition is equivalent to a simpler condition. What is it? (Write it down on your paper.) Change your program and test with the same input as above. Hand in/upload both versions of the program. As before, you can concatenate all the results together.