# CSC365 Scripting Languages: Chapter 6’s Programming Assignment

Write a Python module that does the following:

1. define a global 2D tuple to store the **closest** distance each plant is from the sun in millions of a mile: <https://www.universetoday.com/15462/how-far-are-the-planets-from-the-sun/>
2. the main function should keep looping until the user wants to quit  
   handle both q (upper or lower) OR the word quit (upper or lower)  
   so use the lower method
3. allow the user to enter a planet’s name  
   handle for both capitalized or lower case input using the capitalize method
4. based on the selected planet, create a 2D list of the distance from all other planets
5. Use the abs function to always have a positive number for distance
6. Sort the list by distance using the sort method with the key param  
   You will need to use a lambda function for the key function  
   <https://www.geeksforgeeks.org/python-sort-list-according-second-element-sublist/>  
   <https://www.w3schools.com/python/python_lambda.asp>
7. Make sure to write multiple function to keep your code organized, and use parameters.
8. Must use proper documentation

**HINT: You can unpack a tuple or list like this (I expect to see something like this in your code):**

for planet\_info in planets:  
 planet, distance = planet\_info

which is more readable than accessing the items using indexes:

for planet in planets:  
 print(planet[0], planet[1])

**Example of my program output:** Your input/output should look just like mine OR nicer 😊

======================================================================

Planets: Earth Jupiter Mars Mercury Neptune Saturn Uranus Venus

Please enter one of the above planet names or q to quit: test

======================================================================

Error! Unable to locate Test in list.

======================================================================

Planets: Earth Jupiter Mars Mercury Neptune Saturn Uranus Venus

Please enter one of the above planet names or q to quit: venus

======================================================================

Earth is 25 million miles from Venus

Mercury is 37 million miles from Venus

Mars is 61 million miles from Venus

Jupiter is 394 million miles from Venus

Saturn is 773 million miles from Venus

Uranus is 1644 million miles from Venus

Neptune is 2704 million miles from Venus

======================================================================

Planets: Earth Jupiter Mars Mercury Neptune Saturn Uranus Venus

Please enter one of the above planet names or q to quit: q

======================================================================

Live Long and Prosper V

Process finished with exit code 0

# Psuedocode:

Define a 2D tuple that can't be changed once it's created

closest distance from the sun in millions of a mile

https://www.universetoday.com/15462/how-far-are-the-planets-from-the-sun/

**# get the selected planet's distance from the sun**

**def get\_planet\_distance(selected\_planet):**

iterate through the planets tuple using a for loop

unpack planet's name and distance

if the current planet name equals the selected planet

return the planet's distance from the sun

return -1 if the planet is not found

**# display the generated list for each planet's distance from the selected planet**

**def display\_distances(selected\_planet, distance\_list):**

iterate through the distance\_list that was just created & received

unpack the planet's name & distance

print the planet's name, and distance from the selected planet

**# generated a list for each planet's distance from the selected planet**

**def distance\_from\_planet(selected\_planet):**

create an empty list

get the distance for the selected planet by calling get\_planet\_distance passing the selected planet name

if the returned distance equals -1

display a meaningful message about the planet not found

return

iterate through the planets tuple

unpack the planet's name & distance

only compare planets that is not the selected planet

if the planet doesn't equal the selected planet:

then calculate the distance using abs

append the planet name and distance to the empty list created at the start of this function

sort the newly created list by using a a lambda function

display the distances report by calling the function and passing the selected planet's name & newly created list

**# display the all the planet's names from the tuple list**

**def display\_planets():**

print the word planets without going down a line

iterate through the planets tuple

unpack the planet's name and distance

print the planet's name followed by a space without doing down a line

**# main function that keeps the program looping until the user enter q for quit**

**def main():**

while true

call display\_planets to display a list of planets to choose from

prompt the user to enter a valid planet's name

handle for both capital and lower case letter q

exit the while loop

call distance\_from\_planet passing the selected planet capitalized