Before you start writing your program:

Use the template to create a Software Development Plan (devPlan05.txt) to plan your solution to the assign05 assignment problem.

> NOTE: Your submitted file(s) MUST be spelled and cased as instructed.

Program: assign05.c

The distance to the horizon increases as you climb a mountain (or a hill). The express

$$d = \sqrt{2rh + h^2}$$

The line is the top of a radical sign... square root sign.

> Read all instructions before beginning your work.

where

d = distance to the horizon,
r = radius of the earth, and
h = height of the hill.

can be used to calculate that distance The distance depends on how high the hill is and the radius of the earth (or another planetary body). Read the heights (km or ft) from the data file. Print a table with columns: the planet number, mountain height (miles), and distance from the horizon (miles). Print the highest mountain on each planet at the end of the report.

The information about some of the mountains on Mars and Earth is stored in the text data file,

mountainHeights.txt,

where
11 is the number of mountains for loop control when reading,
4 and 3 are planet ID numbers to determine where the mountain is,
and the second column is the height of the mountains.

Note that

Earth's diameter is 7926 miles.
Mars' diameter is 4217 miles.

Mars, 4th planet from the sun Mons (mountain)	Height* (km)
Arsia Mons	16.0
Ascraeus Mons	18.0
Elysium Mons	12.5
Olympus Mons	27.0
Pavonis Mons	8.7

Earth, 3rd planet from the sun Mountains	Height* (ft)
Mount Everest	29029
Aconcagua	22841
Lookout	2392
McKinley	20320
Rainier	14410
Mitchell	6684

* http://en.wikipedia.org

Problem Constants:
filename
earth_diameter is 7926 miles
mars_diameter is 4217 miles

Problem Inputs:

Problem Outputs:

Other variables:

Equations:

Algorithm:
(Use the algorithm in your development plan as comments in your program.)

> New commands
> FILE *
> fopen
> end program if not good open
> fscanf
> CONSTANT variables
> #define

Sample Input/Output:

```
Distance from Mountain Peak and Horizon
Planet      Mountain     Horizon               mountainHeights.txt
Number      Height*      Distance*
------      --------     --------
   4           9.9        205.0
   4          11.2        217.5
   4           7.8        181.2
   4          16.8        266.5
   4           5.4        151.1
   3           5.5        208.8
   3           4.3        185.2
   3           0.5         59.9
   3           3.8        174.7
   3           2.7        147.1
   3           1.3        100.2
* Units = miles


The highest mountain on Mars: 16.8 miles
The highest mountain on Earth: 5.5 miles
```

```
11
4 16.0
4 18.0
4 12.5
4 27.0
4 8.7
3 29029.0
3 22841.0
3 2392.0
3 20320.0
3 14410.0
3 6684.0
```

General Instructions:

- ☐ Insert comments at the top and throughout each file
  - o Include the follow comments at the beginning of this (and ALL) files.
    - // your name
    - // assignment number
    - // date you completed the assignment
    - // statement(s) about collaboration
    - // a short narrative about what the file does
  - o Use the algorithm as comments throughout each file
- ☐ Use descriptive variable names.
- ☐ Use Sample Input/Output as a guide.
  - o Save the name of the data file as a CONSTANT.
  - o Use title and column headers
  - o Print column numbers right-aligned

- ☐ Divide you solution program code into sections as noted in the algorithm.
  Use section comments as well as the algorithm step comments.
- ☐ Indent all blocks.

> *-7 points per file for absence of any of these required comments at the top*

Submit via Blackboard:

assign05.c	m script program file
devPlan05.txt or .rtf	Development plan
mountainHeights.txt	The data file that you downloaded needs to be submitted so that there is a copy in your submission folder for your program to read.

CAUTION!!!

assign02b

a   a.exe stack...

> *NOTE: Your submitted file(s) MUST be spelled and cased as instructed.*