CS368 Summer 2018
Programming Assignment 1

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- Due Date: Tuesday, July 3 by 11:59 pm

Problem 1: Creating a tip table

Create and display a matrix with four columns:

- column 1 contains bill totals from $5 to $100 in increments of $5
- column 2 contains the tip amount if the tip is 15% of the bill
- column 3 contains the tip amount if the tip is 18% of the bill
- column 4 contains the tip amount if the tip is 20% of the bill

```
clear
format bank  % this will format money values nicely

tips = [5:5:100]';  % create the vector of each amount of money
tips = tips(:,[1 1 1 1]);
tips = tips .* [1 0.15 0.18 0.2];   % calculate the amount of tips in
 each proportion

disp(tips)
format short % change formatting back to default setting
```

```
    5.00    0.75    0.90    1.00
   10.00    1.50    1.80    2.00
   15.00    2.25    2.70    3.00
   20.00    3.00    3.60    4.00
   25.00    3.75    4.50    5.00
   30.00    4.50    5.40    6.00
   35.00    5.25    6.30    7.00
   40.00    6.00    7.20    8.00
   45.00    6.75    8.10    9.00
   50.00    7.50    9.00   10.00
   55.00    8.25    9.90   11.00
   60.00    9.00   10.80   12.00
```

```
   65.00    9.75   11.70   13.00
   70.00   10.50   12.60   14.00
   75.00   11.25   13.50   15.00
   80.00   12.00   14.40   16.00
   85.00   12.75   15.30   17.00
   90.00   13.50   16.20   18.00
   95.00   14.25   17.10   19.00
  100.00   15.00   18.00   20.00
```

Problem 2: Density of freshwater

Shows water density under each temperature

```
clear
TF = [40 68 100]';
TC = 5/9*(TF - 32);
d = 5.5289 * 10^(-8)*TC.^3 - 8.5016*10^(-6)*TC.^2 + 6.5622*10^(-5)*TC
 + 0.99987;

disp("Freshwater density is "+num2str(d(1))+" at "+num2str(TF(1))+"
 F");
disp("Freshwater density is "+num2str(d(2))+" at "+num2str(TF(2))+"
 F");
disp("Freshwater density is "+num2str(d(3))+" at "+num2str(TF(3))+"
 F");
```

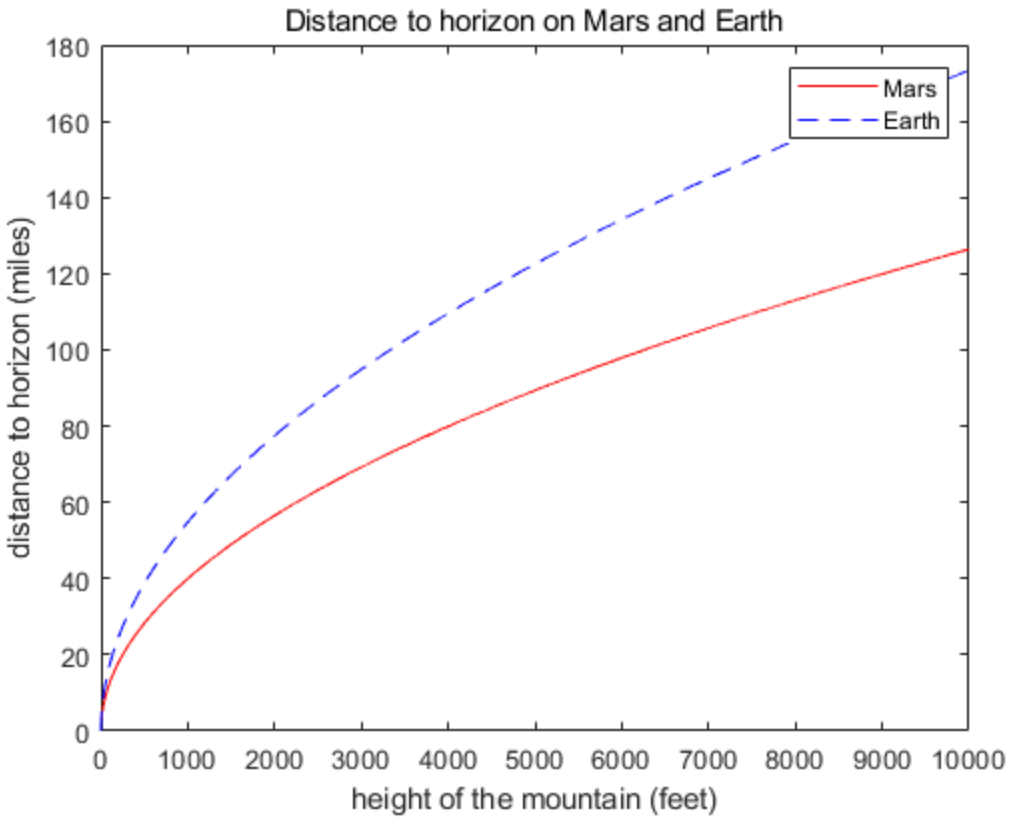
```
Freshwater density is 1 at 40 F
Freshwater density is 0.99822 at 68 F
Freshwater density is 0.9932 at 100 F
```

Problem 3: Distance to horizon

Plot the distance to the horizon vs the height of a hill for hill heights from 0 to 10,000 feet on Earth and Mars on one plot figure.

```
clear
h = 0:1:10000;  % set increment to 1
dmars = sqrt(2*4217*5280.*h + h.^2)/5280;  % calculate the distance on
 Mars
dearth = sqrt(2*7926*5280.*h + h.^2)/5280;  % calculate the distance
 on Earth

figure
plot(h, dmars,'r', h, dearth, 'b--')
title("Distance to horizon on Mars and Earth")
xlabel("height of the mountain (feet)")
ylabel("distance to horizon (miles)")
legend("Mars", "Earth")
```



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