Name: Nick McCullough HW 1

February 2, 2022

Problem 1.10

There are 1.6093 kilometers in a mile. Create a variable to store a number of miles. Convert this to kilometers, and store in another variable.

- - - -*(insert your solution here)*

```
clear,clc
%Nick McCullough, AerE 161, HW1, Problem 1.10
%There are 1.6093 kilometers in a mile.  Create a variable to store a %number of miles.  Convert this to kilometers, and store in another %variable.

Miles = input('How many miles:') % this shows how many miles
Kilometers = Miles*1.6093 %converts miles to kilometers
```

Output 1:

------*(insert output (your results) here)*

How many miles:5

Miles =

5

Kilometers =

8.0465

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Problem 1.11

Create a variable ftemp to store a temperature in degrees Fahrenheit (F).
Convert this to degrees Celsius (C) and store the result in a variable ctemp. The conversion factor is C = (F – 32) * 5/9.

- - - -*(insert your solution here)*

```
clear,clc
%Nick McCullough, AerE 161, HW1, Problem 1.11
%Create a variable ftemp to store a temperature in degrees Fahrenheit (F) Convert this to degrees Celsius (C) and store the result in a variable ctemp.  The conversion factor is   C = (F – 32) * 5/9.

ftemp = input('Enter Fahrenheit degree value F:') % created ftemp variable
disp('The Fahrenheit conversion to Celsius degrees C is:') % converting
ctemp = (ftemp-32)*(5/9) %converting ftemp to ctemp for Celsius value
```

------*(insert output (your results) here)*

Output 1:

```
Enter Fahrenheit degree value F:100
```

Output 2:

```
ftemp =
```

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100

The Fahrenheit conversion to Celsius degrees C is:

ctemp =

37.7778

Problem 1.19

The combined resistance RT of three resistors R1, R2, and R3 in parallel is given by RT = 1 / ($1/R_1 + 1/R_2 + 1/R_3$)

Create variables for the three resistors and store values in each, and then calculate the combined resistance.

- - - -*(insert your solution here)*

```
clear,clc
%Nick McCullough, AerE 161, HW1, Problem 1.19
R1 = input('Enter value for resistor 1, R1:') % user enters variable R1
R2 = input('Enter value for resistor 2, R2:') % user enters variable R2
R3 = input('Enter value for resistor 3, R3:') % user enters variable R3
disp('Combined Parallel Resistance') % explains what next value means
RT = 1/(1/R1+1/R2+1/R3) % equation for combined parallel resistance of all resistors
```

------*(insert output (your results) here)*

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Output 1:

Enter value for resistor 1, R1:1

R1 =

1

Output 2:

Enter value for resistor 2, R2:2

R2 =

2

Output 3:

Enter value for resistor 3, R3:3

R3 =

3

Output 4:

Combined Parallel Resistance

RT =

0.5455

Problem 1.38

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The geometric mean g of n numbers xi is defined as the nth root of the product of xi:

g = (% couldn't get the expression to copy & paste – Nick)

(This is useful, for example, in finding the average rate of return for an investment which is something you'd do in engineering economics). If an investment returns 15% the first year, 50% the second, and 30% the third year, the average rate of return would be (1.15*1.50*1.30)⅓. Compute this. Hint: use nthroot function.

- - - -*(insert your solution here)*

```
clear,clc
%Nick McCullough, AerE 161, HW1, Problem 1.38
A = 1.15; % variable created for A
B = 1.50; % variable created for B
C = 1.30; % variable created for C
g = nthroot(A*B*C,3); % nthroot function with all variables comma 3
disp(g); % displays g function value
```

------*(insert output (your results) here)*

Output 1:

```
1.3089
```

Problem 1.39

Use the deg2rad function to convert 180 degrees to radians.

- - - -*(insert your solution here)*

```
clear,clc
%Nick McCullough, AerE 161, HW1, Problem 1.39
%Use the deg2rad function to convert 180 degrees to radians.
D = 180 % expresses degree value
```

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```
disp('180 degrees converted to radians is ')
deg2rad(D) % degree 2 radian function, converting D to radians.]
```

------*(insert output (your results) here)*

Output 1:

```
D =

   180

180 degrees converted to radians is

ans =

    3.1416
```

Problem 2.8

Using the colon operator and also the linspace function, create the following row vectors. Please note: Each vector must be created twice: first, with colon operator and then with linspace function.

```
   -4    -3    -2    -1     0

    9     7     5

    4     6     8
```

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- - - -*(insert your solution here)*

```
clear,clc
%Nick McCullough, AerE 161, HW1, Problem 2.8
%using colon operator and linspace function to create vectors
A1 = [-4:0]; % 1st colon operator
A2 = [9:-2:5]; % 2nd colon operator
A3 = [4:2:8]; % 3rd colon operator
Z1 = linspace(-4,0,5); % 1st linspace function
Z2 = linspace(9,5,3); % 2nd linspace function
Z3 = linspace(4,8,3); % 3rd linspace function
```

------*(insert output (your results) here)*

Output 1:

```
A1 =

   -4    -3    -2    -1     0


A2 =

    9     7     5


A3 =

    4     6     8


Z1 =
```

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```
   -4    -3    -2    -1     0
```

```
Z2 =

    9     7     5
```

```
Z3 =

    4     6     8
```

Problem 2.19

Generate a 2 x 3 matrix of random

• real numbers, each in the range (0, 1)

• real numbers, each in the range (0, 5)

• integers, each in the inclusive range from 10 to 50

- - - -*(insert your solution here)*

```
clear,clc
%Nick McCullough, AerE 161, HW1, Problem 2.19
%Generate three different 2x3 matrices
A = randi([0,1],2,3); % 1st matrix variable, A
B = randi([0,5],2,3); % 2nd matrix variable, B
C = randi([10,50],2,3); % 3rd matrix variable, C
disp('Matrix A');disp(A); % displays the matrix A
disp('Matrix B');disp(B); % displays the matrix B
disp('Matrix C');disp(C); % displays the matrix C
```

------*(insert output (your results) here)*

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Output 1:

Matrix A

0 0 0

0 0 1

Matrix B

0 4 5

1 0 4

Matrix C

30 19 49

33 28 32