Directions

First, use Matlab to create another folder inside your checkpoints folder called

`lastname-initial-ppcp01`

where `lastname` is YOUR last name and `initial` is YOUR first initial. Use all lower-case letters when naming your folder for this assignment.

While you are working, make sure you stay in this folder so that all your files will be saved inside it.

When you have finished the assignment, use Matlab to create a `.zip` file of your checkpoint folder. This folder must contain all your `.m`-files. Submit only this `.zip` file to the D2L dropbox.

Problems

1. The wind chill factor measures how cold it feels with a given air temperature and a given wind speed. One formula for the wind chill factor is

$$F = 35.7 + 0.6T + (0.43T - 35.7)\,V^{0.16},$$

where F is the wind chill factor, T is the temperature in degrees Fahrenheit, and V is the wind velocity in miles per hour.

Write a Matlab function called `chilloutman.m` which will calculate the wind chill factor when given the temperature and wind speed. Your function should use the input parameters `temp` and `speed`, and the output parameter `chillfact`. Your function should work if both input parameters are scalars, if one is a scalar and one is a vector, and if both are vectors of the same length. Function specifications and some sample function calls are given below.

input parameters	`temp`	temperature in degrees Fahrenheit
	`speed`	wind velocity in miles per hour
output parameter	`chillfact`	wind chill factor

sample function calls

`chilloutman(30,10)`	produces `20.7440`
`chilloutman(30:5:40,10)`	produces `[20.7440,26.8517,32.9594]`
`chilloutman(30,10:5:20)`	produces `[20.7440,18.5351,16.8787]`
`chilloutman([30,35],[10,15])`	produces `[20.7440,24.8511]`

2. As part of a computer event log, a certain factory assigns shift numbers to each computer event. Shift 3 extends from midnight to 8AM, shift 1 extends from 8AM to 4PM, and shift 2 extends from 4PM to midnight. For example, if a computer event occurs at 12:47PM (that is, for the real number `hour = 12.7833`), the event log records it as an event occurring during shift `1`.

   Write a Matlab program called `shiftyeyes.m` which will take a single input, `hour` (representing the event time), and produce a single output, `shift` (representing the shift during which the event occurred). Your function should be designed to work with a 24 hour day. If your function receives an `hour` less than `0` or greater than or equal to `24` it should return an error flag by setting the value of `shift` to `-1`. Function specifications and some sample function calls are given below.

input parameter	`hour`	time of computer event (real number)
output parameter	`shift`	shift number of computer event

   sample function calls

`shiftyeyes(8)`	produces `1`
`shiftyeyes(19.78)`	produces `2`
`shiftyeyes(25.9)`	produces `-1`

   NOTE: You may assume `hour` is already a real number . . . you don't need to worry about changing a time like 8:17AM into the numeric value `8.2833`, you may assume the number `8.2833` would be the value given to the function in the first place.

3. Write a Matlab function called `oddduck.m` which will take a vector of integers `vec` and return the product of only its odd positive entries as the value `oddprod`. All negative entries, zero entries, and positive even entries will be ignored. If the vector contains no odd positive entries, then the function should simply return the value `1`.

input parameter	`vec`	vector of integer values
output parameter	`oddprod`	product of only odd positive entries

   sample function calls

`oddduck([1,2,3,4,5,6,7])`	produces `105`
`oddduck([-2,3,0,9,4,-5])`	produces `27`
`oddduck([-8,-1,0,2])`	produces `1`
`oddduck([2,4,6,8,10])`	produces `1`

   HINT: Use a mask! Look at your diary file for Feb. 5. Also, you may want to look up the `prod` function in the Matlab Help system.