

## EE 289 – Homework Chapter 7

**1** Write a function named `cellParse` that takes in a cell array with each element being either a string (character array), or a vector (containing numbers), or a Boolean value (logical array of length 1). Your function should return the following:

- `nStr`: the number of strings
- `nVec`: the number of vectors
- `nBool`: the number of Boolean values
- `cString`: a cell array of all the strings in alphabetical order
- `vecLength`: the average length of all the vectors
- `allTrue`: true if all the Boolean values are true and false otherwise

**For example,**

```
[a b c d e f]=cellParse({[1 2 3],true,'hi there!', 42, false, 'abc' })
```

Should return `a = 2, b = 2, c = 2, d = {'abc','hi there!'}, e = 2, and f = false.`

**2** It turns out that since you have become an expert on rating clothing (Chapter 4, Problem 5), Acme Clothing Company has hired you to rate its clothes. Clothes are now represented as structures instead of vectors with the fields (all of which are numbers between 0 and 5):

Condition, Color, Price, Matches, and Comfort

Acme has a much simpler way of rating its clothes than you used before:

$$\text{Rating}=5*\text{Condition}+3*\text{Color}+2*\text{Price}+\text{Matches}+9*\text{Comfort}$$

You have a script called `makeClothes.m` that will create a structure array called `acmeClothes` that contains clothes structures. You are to write a script called `rateClothes` that will add a `Rating` field and a `Quality` field to each of the structures in the `acmeClothes` array. The `Rating` field in each structure should contain the rating of that particular article of clothing. The `Quality` field is a string that is 'premium' if the `Rating` is over 80, 'good' over 60, 'poor' over 20, and 'liquidated' for everything else.

**Note:**

- a. You **MUST** use iteration to solve this problem.
- b. To make things easy, just place the `makeClothes` at the top of your script, so you're guaranteed to have the correct `acmeClothes` array to work with.
- c. The fields are case sensitive, so make sure that you capitalize them.

**3** You have been hired by a used-car dealership to modify the price of cars that are up for sale. You will get the information about the car, and then change its price tag depending on a number of factors. Write a function called `usedCar` that takes in a structure with the following fields:

`Make`: A string that represents the make of the car (e.g., 'Toyota Corolla')

`Year`: A number that corresponds to the year of the car (e.g., 1997)

`Cost`: A number that holds the marked price of the car (e.g., 7,000)

`Miles`: The number of miles clocked (e.g., 85,000)

Accidents: The number of accidents the car has been in (e.g., 1)

Your function should return a structure with all the above fields, with *\*exactly\** the same names. If should have the same make, year, accidents, and miles. Here are the changes you must make.

1. Add 5,000 to the cost if the car has clocked less than 20,000 miles.
2. Subtract 5,000 if it has clocked more than 100,000 miles.
3. Reduce the price by 10,000 for every accident.

**4** This problem deals with structures that represent dates.

- a. First, write a MATLAB function called `createDate` that will take in three numeric parameters. The first parameter represents the month, the second the day, the third the year. The function should return a structure with the following field:

Day: a number

Month: a 3 character string containing the first three characters of the month name

Year: a number of containing the year.

For example,

`It=createDate(3,30,2008)` should return a structure containing:

Day: 30

Month: Mar

Year: 2008

- b. Write a function called `printDate` that displays a date in the form Mar 30, 2007
- c. Write a function `inBetween` that will take in three date structures. The function should return true if the second date between the first and third dates, otherwise the function should return false.
- d. Write a function called `isSorted` that takes in a single parameter, an array of date structures. This function should return true if all the date in the array are in a chronological order (regardless of whether they are in ascending or descending order), otherwise the function should return false.
- e. Write a test script that creates an array of date structures, prints out each date, and then states whether or not the dates are in order.