EGR 141: Selection Statements

Summary: The goal of this lab is to help understand selection statements (ifs and switches). You should not use any MATLAB commands or concepts that are discussed in future chapters and sections (no loops yet!)

- Each of the following problems should have a script and, possibly, a function associated with them.
- For each problem, the script file should be called something appropriate, such as *Lab5_1_yourName.m*.
- Include any functions that you needed to create in order to complete the problem. Name them whatever is indicated in the problem.
- Inside your script, solve each of the given problems. In between each problem, type *pause;* Clearly indicate where the code for each problem begins by using a comment block. Start each new problem with a *clear .*
- If my example output "lines up nicely" then your output should as well.
- All output statements involving variables should output variable values, not pre-computed constants. For example, if I ask you to output $r/2$ when $r = 3$, then you should set r to be three then output as *fprintf(' r/2 = %f ',r/2);* and not *fprintf('r/2 =1.5')* or *fprintf(r/2 = %f',3/2)*.
- Note that example output for each problem is not necessarily correct output (I intentionally do different output than what you will do).

1. Create a function, called *volumeConv*, which converts between cubic meters (M), cubit feet (F), liters (L) or gallons (G) (yes, I know these are not correct abbreviations). Your function should have three input arguments, in this order:
   - *volume*: A floating point number that represents the volume we're starting with
   - *from*: A string or character representing the units M, F, L, or G (of the volume we are converting from)
   - *to*: A string or character that is either M, F, L, or G (the volume we are converting to)

   The function should return the converted volume. Use at least 8 decimal digits for any conversion. Display an error message to the user and return an empty array if either *from* or *to* is an invalid choice. In your script file, test your function on the following
   - 0.0075708236 cubic meters to gallons
   - 28.316847 liters to cubic feet
   - 2.1133764 gallon to liters
   - 247.20267 cubic feet to cubic meters

   Print the input and output nicely to the screen in your script file using *proper units* and 4 decimal digits.

```
Lab 5 - Volume Conversion
  8 cubic meter is 2113.3760 gallons
  8 liters is 0.2825 cubic feet
```

2. The file *id_lab_hw_projGrades.txt* contains four columns: ID, lab average, homework average, and project average for a Computer Science class. In your script, do the following:
   - Load the file
   - You are welcome to split the data into different vectors, if you wish
   - Ask the user to enter in an ID number

- If the number is found, print out the ID, three averages, and total class average. Make HW worth 30%, projects 35% and labs 35%.
  Use only two digits for the grades. The ID should be printed as an integer.
- If the number is not found, print out a message indicating no such ID number was found.

```
Lab 5 - Grades
Please enter in an ID to receive the final grade (b/t 1 and 99): 4
ID found!
ID            :      4
HW            :  50.83
Proj          : 100.00
Lab           :  73.33
Final Grade   :  75.91
```

3. Create a mini game where one tries to fill in one of the top sections in Yahtzee. The goal is to get as many "of a kind" in a roll of 5 dice. The game proceeds as

   (a) The player rolls 5 dice. They choose which of the die to "hold" and not re-roll

   (b) The player rolls the non-held dice. They choose which of the dice (overall, including the ones they held in part (a)) to hold again.

   (c) The player rolls the remaining non-held dice.

   (d) Display the final sorted dice "list" to the user.

   No if or switch statements should be used in this entire problem (you may assume the user enters in valid indices).

```
Lab 5 - Yahtzee-ish
Your dice are  1  1  2  3  4
 Which would you like hold (enter indices as a vector)?: [1 2]
Your dice are  1  1  3  5  5
 Which would you like hold (enter indices as a vector)?: [1 2]
Your final dice are  1  1  1  1  4
```

4. Create either a text-based or graphical menu system where the user receives a music or movie recommendation. You should

   (a) Ask the user if they want to get a movie or music recommendation (or neither)

   (b) Depending on their choice, list out at least three genres. If they make an non-existent choice, output a message to the screen and exit the menu.

   (c) Give the user your top three suggestions, depending on this genre (and movie or music) choice.

   You do not have to verify each piece of input is a number (you may assume it). Make sure you provide clear instructions to the user.

```
Lab 5 - Recommendation System
Would you like a (1) Music or (2) Movie recommendation? (enter 1 or 2) 2
Choose one of the following genres
 1: Comedy
 2: Horror
 3: Drama
Enter 1,2, or 3: 1
Dostert's Movie Recommendations are:
 1.Ferris Bueller's Day Off
 2.Groundhog Day
 3.Coming to America
```