Quiz 2 will be in class on Friday, February 1. The quiz will cover material from weeks 4-6. I expect you to be able to

1. Write scripts that take user input using MATLAB's `input` function

2. Write your own functions in MATLAB

3. Understand the difference between a MATLAB `function` and `script`

4. Use of relational expressions and logical operators.

5. Use selection control statements - `if`, `switch`/`case` statements.

6. Use iteration control - `for`, `while` including nested loops to compute series sums

7. Vectorize `for` loops.

8. Use `fprintf`.

9. Understand how to use `feval` to evaluate annynomus functions, inline functions or user defined functions.

Practice problems

1. Create a script that asks the user for the Reynolds number (a ratio of inertial forces to viscous forces) N and computes the drag coefficient, C using the following formula:

$$C = \begin{cases} 0, & N \le 0 \\ \dfrac{24}{N}, & N \in (0, 0.1] \\ \dfrac{24}{N}(1 + 0.14N^{0.7}) & N \in (0.1, 1.0e + 03] \\ 0.43, & N \in (1.0e + 03, 5.0e + 05] \\ 0.19 - \frac{8.0e+04}{N}, & N > 5.0e + 05 \end{cases}$$

Use `if`, `elseif` statements.

2. Write a script that asks the user for an integer and checks whether it can be divided by 2 or 3. Consider all possible cases, e.g. divisible by both 2 and 3, divisible by 2 and not by 3, e.t.c.

3. Write a script that asks the user for a month (numbered from 1 to 12 and prints the number of days in that month. (use the `switch` construction)

4. Write a function that takes as input any matrix `A` and transposes `A` using `for` loops. Compare your output to the MATLAB operation `A'`.

5. Write a MATLAB function that returns a vector of prime numbers between `xmin` and `xmax`. Use the MATLAB `isprime` function.

6. Write a MATLAB function `sumsteps2` that calculates and returns the sum of 1 to n is steps of 2, where n is an argument passed to the function. e.g. if 11 is passed in, your function should return $1 + 2 + 5 + 7 + 9 + 11$.

7. Write a MATLAB script that creates a random vector of integers between -20 and 20 of length 10. Give relational expressions and logical operators to:

   (a) Find the number of positive integers

   (b) Extract any prime numbers in the vector

   (c) Add 2 to the even elements of the vector