1. **Table of Logarithms** Write a MATLAB program to generate a table of the base-10 logarithms between 1 and 10 in steps of 0.1. The table should start on a new page, and it should include a title describing the table, row, and column headings. This table should be organized as shown:

	X.0	X.1	X.2	X.3	X.4	X.5	X.6	X.7	X.8	X.9
1.0	0.000	0.041	0.079	0.114	...					
2.0	0.301	0.322	0.342	0.362	...					
3.0	...									
4.0	...									
5.0	...									
6.0	...									
7.0	...									
8.0	...									
9.0	...									
10.0	...									

2. Write a MATLAB program that reads a time in seconds since the start of the day (this value will be somewhere between 0 and 86400) and prints a character string containing time in the form `HH:MM:SS` using the 24-hour clock convention. Use the proper format converter to ensure that leading zeros are preserved in the `MM` and `SS` fields. Also, be sure to check the input number of seconds for validity, and write an appropriate error message if an invalid number is entered.

3. Write a program that reads an arbitrary number of real values from a user-specified input data file, rounds the values to the nearest integer, and writes the integers out to a user-specified output file. Make sure that the input file exists, and, if not, tell the user and ask for another input file. If the output file exists, ask the user whether or not to delete it. If the output file does not exist, prompt for a different output filename.

4. **Table of Sines and Cosines** Write a program to generate a table containing the sine and cosine of θ for θ between $0°$ and $90°$, in $1°$ increments. The program should properly label each of the columns in the table.

5. Create a 400 × 400 element `double` array `x`, and fill it with random data using function `rand`. Save this array to a MAT-file `x1.dat`, and then save it again to a second MAT-file `x2.dat` using the `-compress` option. How do the sizes of the two files compare?