1. Create a program that first prompts the user to enter a value for \( x \) and then prompts the user to enter a value for \( y \). If the value of \( x \) is greater than the value of \( y \), send a message to the command window telling the user that \( x > y \). If \( x \) is less than or equal to \( y \), send a message to the command window telling the user that \( y \geq x \).

2. Write a MATLAB program that asks the user his/her exam score and then evaluates it. If the score is between 50 and 100, the program displays “Pass”, if it is between 0 and 49 it displays “Fail”. If it is greater than 100 or less than 0 it should display “Error”.

3. Write a MATLAB program for a movie theater to determine whether a customer can get a discount ticket based on his/her age. The discount tickets are given to kids (younger than 12) and seniors (older than 65). Use the logical operator “or” (\(|\)).

4. Use MATLAB to construct a conditional statement which evaluates the function:

\[
f(x) = \begin{cases} 
0 & x < 0 \\
x & 0 \leq x \leq 1 \\
2 - x & 1 < x \leq 2 \\
0 & x > 2 
\end{cases}
\]

5. **HW.** Write a Matlab program to evaluate a function \( f(x,y) \) for any two user specified values \( x \) and \( y \). The function \( f(x,y) \) is defined as follows:

\[
f(x, y) = \begin{cases} 
x + y & x \geq 0 \text{ and } y \geq 0 \\
x + y^2 & x \geq 0 \text{ and } y < 0 \\
x^2 + y & x < 0 \text{ and } y \geq 0 \\
x^2 + y^2 & x < 0 \text{ and } y < 0 
\end{cases}
\]

6. At a local university, each engineering major requires a different number of credits for graduation. For example, recently the requirements were as follows:

<table>
<thead>
<tr>
<th>Engineering Major</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Engineering</td>
<td>130</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>130</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>122</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>126.5</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>129</td>
</tr>
</tbody>
</table>

Prompt the user to select an engineering program from a menu. Use a switch/case structure to send the minimum number of credits required for graduation back to the command window.
7. Write a program that calculates and comments on the body mass index (BMI) of the user. The program should ask the user his/her weight and height, and calculate BMI using the formula:

\[ BMI, \text{kg/m}^2 = \frac{\text{mass}}{\text{height}^2} \]

The comments should be made based on the following conditions:
- \( BMI \leq 23 \) \rightarrow the user has healthy weight.
- \( 23 < BMI < 29 \) \rightarrow The user is overweight.
- \( 29 \leq BMI \) \rightarrow The user is obese.

8. (HW) Write a script file using conditional statements to evaluate the following function, assuming that the scalar variable x has a value. The function is \( y = e^{x-1} \) for \( x < -1 \), \( y = 2 + \cos(\pi x) \) for \(-1 \leq x < 5\), and \( y = 10(x - 5) + 1 \) for \( x \geq 5 \).

Use your file to evaluate \( y \) for \( x = -5 \), \( x = 3 \), and \( x = 15 \), and check the results by hand.

9. (HW) Write a program that accepts a year and determines whether the year is a leap year. Use the \texttt{mod} function. The output should be the variable \texttt{extra_day}, which should be 1 if the year is a leap year and 0 otherwise. The rules for determining leap years in the Gregorian calendar are as follows:

1. All years evenly divisible by 400 are leap years.
2. Years evenly divisible by 100 but not by 400 are not leap years.
3. Years divisible by 4 but not by 100 are leap years.
4. All other years are not leap years.

For example, the years 1800, 1900, 2100, 2300, and 2500 are not leap years, but 2400 is a leap year.

10. (HW) Suppose that we are writing a program that reads in a numerical grade and assigns a letter to its corresponding value according to the following table:

\begin{align*}
95 < \text{grade} & \quad \text{A} \\
86 < \text{grade} \leq 95 & \quad \text{B} \\
76 < \text{grade} \leq 86 & \quad \text{C} \\
66 < \text{grade} \leq 76 & \quad \text{D} \\
0 < \text{grade} \leq 66 & \quad \text{F}
\end{align*}

Write an if construct that will assign the grades as described in the table. Assume that the end-semester grade is calculated using midterm, quiz and final exam grades entered by user.