Conditional Statements in MATLAB

1. If else and if elseif statement

```
% Example 1
if 5 > 8
    disp ('It is True')
else
    disp ('It is False')
end
% Example 2
a = input ('Enter a number; a = ');
b = input ('Enter a number; b = ');
if a < b
    disp ('a < b')
elseif a > b
    disp ('a > b')
else
    disp ('a = b')
end
% Example 3
yournumber = input ('Enter a number: ')
if yournumber < 0
    disp ('negative')
elseif yournumber > 0
    disp ('positive')
else ('zero')
end
% Example 4
nrows = 4;
ncols = 6;
A = ones (nrows, ncols);
for c = 1:ncols
    for r = 1:nrows
                if r == c
            A(r,c) = 2
        elseif abs(r-c) == 1
            A(r,c) = -1
        else
            A(r,c) = 0
        end
    end
end
% Example 5   Evaluate f(x,y) at x and y
```

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

```
 x = input ('Enter the x coefficient: ');
y = input ('Enter the y coefficient: ');
if (x>=0&&y>=0)
    fun = x + y;
   elseif (x>=0&&y<0)
    fun = x + y^2;
   elseif (x<0&&y>=0)
    fun = x^2 + y;
   else (x<0&&y<0)
    fun = x^2 + y^2
end
```

```
OR
clc
clear
x = input ('Enter the x coefficient: ');
y = input ('Enter the y coefficient: ');
if (x>=0&&y>=0)
    fun = x + y;
    fprintf('The value of function is: %f',fun)
   elseif (x>=0&&y<0)
    fun = x + y^2;
    fprintf('The value of function is: %f',fun)
   elseif (x<0&&y>=0)
    fun = x^2 + y;
    fprintf('The value of function is: %f',fun)
   else (x<0&&y<0)
    fun = x^2 + y^2
    fprintf('The value of function is: %f',fun)
end

% Example 6   percentage marks and division
% Grading System in MATLAB

marks = input('Enter the marks (0-100): ');

if marks < 0 || marks > 100
    disp('Invalid marks. Please enter a value between 0 and 100.');
else
    if marks >= 90
        grade = 'A';
    elseif marks >= 80
        grade = 'B';
    elseif marks >= 70
        grade = 'C';
    elseif marks >= 60
        grade = 'D';
    elseif marks >= 50
        grade = 'E';
    else
        grade = 'F';
    end
    % Display the result
    fprintf('Marks: %f, Grade: %s\n', marks, grade)
end

% Example 7    Threshold and Grades
```

2. Switch, case, otherwise

Switch statement blocks a case until it is true

```
% Example 7 a number is even or odd within the range from 1 to 10
value = input ('Enter the input value: ');
switch (value)
    case {1,3,5,7,9}
        disp ('The value id ODD')
    case {2,4,6,8,10}
        disp ('The value is EVEN')
    otherwise
```

```
        disp ('The value is out of the range')
end

% Example 8
clc
clear
day = input ('Enter the Day Number: ');
% Switch statement
switch day
    case 1
        disp('Monday');
    case 2
        disp('Tuesday');
    case 3
        disp('Wednesday');
    case 4
        disp('Thursday');
    case 5
        disp('Friday');
    case 6
        disp('Saturday');
    case 7
        disp('Sunday');
    otherwise
        disp('Invalid day');
end
% Example 9  (Temperature unit converter)
C = input('kelvin, celsius, fahrenheit')
text = input ('c','s')
switch c
    case 'kelvin'
           x=input('enter temprature')
        C=x-273.5
        F=1.8.*x+32
     case 'celsius'
        x=input('enter temprature')
        K=x+273.5
        F=1.8.*x+32
 end

% Example 10 (for loop statement)
   sum = 0; % Initialize sum
         for i = 1:10
   sum = sum + i; % Add the current value of i to sum
end
   disp(sum); % Display the result

% Example 11 (nested for loop)
   A = [1, 2, 3; 4, 5, 6; 7, 8, 9];
   for i = 1:size(A, 1) % Rows
       for j = 1:size(A, 2) % Columns
           fprintf('Element at (%d, %d): %d\n', i, j, A(i, j));
       end
   end
```

```
% Example 12 (for loop and switch statement together)
for i = 1:5
    switch i
        case 1
            disp('This is case 1.');
        case 2
            disp('This is case 2.');
        case 3
            disp('This is case 3.');
        case 4
            disp('This is case 4.');
        case 5
            disp('This is case 5.');
        otherwise
            disp('This case does not exist.');
    end
end
 % Example 12 (for loop and switch statement together)
      % Define the months
      for month = 1:12
      % month = input ('Enter the Month Number: ');
           switch month
              case {12, 1, 2}
                  season = 'Winter';
              case {3, 4, 5}
                  season = 'Spring';
              case {6, 7, 8}
                  season = 'Summer';
              case {9, 10, 11}
                  season = 'Fall';
              otherwise
                  season = 'Invalid month';
          end
              fprintf('Month %d: %s\n', month, season);
      end
% Example 12 (for loop and switch statement and go to start)
for attempt = 1:5
  userInput = input('Enter a command (1-3) or 0 to exit: ');
        switch userInput
        case 1
            disp('You selected option 1.');
        case 2
            disp('You selected option 2.');
        case 3
            disp('You selected option 3.');
        case 0
            disp('Exiting...');
            break; % Exit the loop if the user wants to quit
        otherwise
            disp('Invalid input, try again.');
            continue; % Go back to the start of the loop
  end
end
```

```
% Example 13  (Use break to exit a loop)
 for i = 1:10
    if i == 5
        disp('Reached 5, exiting the loop.');
        break; % Exit the loop when i equals 5
    end
    fprintf('Current number: %d\n', i);
 end
 % Example 14 (Use continue to skip the iteration)
for i = 1:10
    if mod(i, 2) == 0
        continue; % Skip the rest of the loop for even numbers
    end
    fprintf('Odd number: %d\n', i);
end
% Example 15 (break and continue)
for i = 1:10
    if i == 8
        disp('Reached 8, exiting the loop.');
        break; % Exit the loop when i equals 8
    elseif mod(i, 2) == 0
        continue; % Skip even numbers
    end
    fprintf('Current odd number: %d\n', i);
end
```