BME1901 – Introductory Computer Sciences
Laboratory Handout – 4

OBJECTIVES

Learn about,

- if-elseif-else conditional assignments
- Solving various questions

TOOLS

if-elseif-else conditional assignments[1]

if conditional assingment:

"if" executes the statements given below it when condition given in expression is true. "end" is needed to mark end of statements realted to if.

```
if (expression)

    statements

end
```

Example: Write a code that checks whether user input "a" (real number) is greater than 0, then displays "Given number is positive" if it is true, and does nothing in other sutiations.

```
a = input('Give a number: ');

if a>0

    disp('Given number is positive.');

end
```

if-else conditional assingment:

"if-else" executes statements given below the "if" when condition given in expression is true, and executes statements given below "else" when condition given in expression is false. "end" is needed to mark end of the statements related to "if-else".

```
if (expression)

    statements

else

    statements

end
```

[1] https://www.mathworks.com/help/matlab/ref/if.html

Example: Write a code that checks whether user input "a" (real number) is greater than 0, then displays "Given number is positive" if it is true, and displays "Given number is negative or zero" in other conditions.

```
a = input('Give a number: ');

if a>0

    disp('Given number is positive.');

else

    disp('Given number is negative or zero.');

end
```

if-elseif-else conditional assingment:

"if-elseif-else" executes statements given below the "if" when condition given in if's expression is true, when if's expression is false and elseif's expression is true then statements given below the "elseif" are executed, when all expressions are false then statements given below "else" are executed. "if-elseif-else" codes may have any number of "elseif" conditional assingmnets but only one of each "if" and "else". "end" is needed to mark end of the statements related to "if-elseif-else".

```
if (expression)

    statements

elseif (expression)

    statements

else

    statements

end
```

```
if (expression)

    statements

elseif (expression)

    statements

          .
          .
          .

elseif (expression)

    statements

else

    statements

end
```

Example: Write a code that checks whether user input "a" (real number) is greater than 0, then displays "Given number is positive" if it is true, if previous check is false then checks whether "a" is less than 0 and displays "Given number is negative" if it is true, and displays "Given number is zero" in other conditions.

```
a = input('Give a number: ');

if a>0

    disp('Given number is positive.');

elseif a<0

    disp('Given number is negative.');

else

    disp('Given number is zero.');

end
```

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PROBLEMS

1. Write a script (m-file) called "grade.m" that requests student's garde (between 0-100) from the user then displays the letter grade of the student with respect to the table given below.

A	B	C	D	F
100-80	79-60	59-40	39-20	19-0

2. Write a script (m-file) called "salary.m" that request a three element vector input from the user, where first element is the hourly wage of the employee, second element is the weekly working hours (normal weekly working hours is 40 hours anything more is counted as overtime working hours), third element is the weekend overtime working hours. Normal working hours pay the regular hourly wage, weekday overtime working hours pay 1.5 times of the hourly wage and weekend overtime working hours pay double the hourly wage. After the request of the input, code should calculate and display the weekly salary of the employee.

3. Write script (m-file) called "nucleic_acid.m" that requests a character array input from the user in the form of a nucleic acid chain (e.g.: ATGCAACGATTCG). Then checks and displays the appropriate message with respect to given conditions below.
    a. Displays "Given chain is a DNA" if components are A (adenine), T (thymine), G (guanine), C (cytocine).
    b. Displays "Given chain is an RNA" if components are A (adenine), U (uracil), G (guanine), C (cytocine).
    c. Displays "Given chain may be a DNA or an RNA" if components include A (adenine), G (guanine), C (cytocine) bot do not include T (thymine) and U (uracil).
    d. Displays "Given chain cannot be a nucleic acid chain" in other conditions (i.e.: if components include T (thymine) and U (uracil) at the same time, or any other characters other than nucleic acids).

HINTS FOR POOL PROBLEMS

Using supplied Melanoma image, necessary functions, and masking via threshold technique, you may acquire a binary image of the affected area. Each value of this binary image matrix may be set to either 1 (one) marking melanoma affected skin or 0 (zero) marking regular skin. Then you may find the ratio of the affected zone to the whole image and check whether it is dangerous or not. If the ratio is greater than a value (e.g.: 5%), it may be classified as dangerous.