Lab #2

Contents

1 Conditional statements

1.1 Boolean data type

Boolean data type takes one of two possible logical values: "true" or "false". Matlab stores "false" and "true" as 0 and 1 respectively.

1.2 Conditional expressions

The result of a conditional expression is of boolean type.

Examples of conditional expressions

```
a = 10;

a < 30 % true
```

```
a > 20 % false
a == 10 % true
a == 11 % false
```

1.3 if statement

`if` statement allows you to perform different computations or actions depending on whether a condition evaluates to true of false.

Basic syntax is:

```
if condition
    code
end
```

Example:

```
a = 10; % try to change the value!

if a > 9
    disp('a is greater than 9');
end


if a < 20
    disp('a is less than 20');
end
```

1.4 else statement

Code in the `else` block will be executed if `condition` is false.

Basic syntax:

```
if condition
    code1
else
    code2
end
```

Example:

```
a = 20;

```

```
if a < 40
    disp('a is less than 40');
else
    disp('a is greater than 40');
end
```

1.5 elseif statement

`elseif` statement allows to combine several conditions. Only the code following the first condition that is found to be true will be executed. All other code will be skipped.

Basic syntax:

```
if condition1
    code1
elseif condition2
    code2
elseif condition3
    code3
...
else
    code
end
```

Examples:

```
a = 10; % try to set a = 4; a = 5; a = 6;

if a > 5
    disp('a > 5');
elseif a < 5
    disp('a < 5');
else
    disp('a == 5');
end
```

1.6 and/or/not operators

If you want to have complex conditions which consist of more than one logical statement, you can use logical "and", "or" and "not" operators.

1.6.1 And

The "and" of two or more conditions is true if each of the conditions is true. For example, `a and b` is true only if `a` and `b` are both true.

In Matlab, logical "and" is written as `&&`.

Example:

```
a = 10;

if a > 5 && a < 15
    disp('a > 5 and a < 15');
else
    disp('a <= 5 or a >= 15');
end
```

1.6.2 Or

The "or" of two or more conditions is true if at least one of the conditions is true. For example, `a or b` is true if either `a` or `b` (or both) are true.

In Matlab, logical "or" is written as `||`.

Example:

```
a = 10;

if a < 5 || a > 9
    disp('a < 5 or a > 9');
else
    disp('9 => a >= 5');
end
```

1.6.3 Not

`not` operator negates the condition. If `a` is true, then `not a` is false. If `a` is false, then `not a` is true.

In Matlab, logical "not" is written as `~`.

Example:

```
a = 10

if ~(a > 0)
    disp('a <= 0');
```

```
else
    disp('a > 0');
end
```

2 Receiving user input

In Matlab, it is possible to interatively ask for user input using command `input()`. It is possible to print some text as an invitation for a user. The user is expected to write some value using his/her keyboard and hit Enter when done.

```
clear;
price = input('Please write the price of an item and
   press Enter: '); % The text between parenthesis
   will be printed as an invitation
amount = input('Please write amount of items to order
    and press Enter: '); % The text between
   parenthesis will be printed as an invitation

total = price*amount
disp('The total price is:')
disp(total)
```

3 Task 2

Tax agency asks you to write a program which asks user to state his/her income and prints how much taxes must be paid. The amount of taxes depends on the income as follows:

- If income is greater or equal to 10 000 000$ or user has negative income (losses) then print text with warning that the estimation is preliminary and invite the user to contact local branch.
- If income is less than 1000$ then no taxes are applied
- Else if income is between 1000$ and 3000$ (including 1000) then 10% should be paid

- Else if income is greater or equal to 3000$ then 40% should be paid but not more than 10 000$

You can test your program on the following data:

- If income is -1000$, tax estimation is 0$ and a warning is printed
- If income is 500$, tax estimation is 0$
- If income is 1000$, tax estimation is 100$
- If income is 2000$, tax estimation is 200$
- If income is 3000$, tax estimation is 1200$
- If income is 1 000 000$, tax estimation is 10 000$
- If income is 99999999999$, tax estimation is 10 000$ and a warning is printed