



# Ordering and logic



To control the flow operations in an algorithm, you must be able to verify some conditions and act accordingly. To check on certain conditions are met or not There are the keyword if and else, which literally means otherwise. If the condition is met then execute some commands otherwise do others. The conditions are verified using logical operations as greater equal to, different from and so on. You must also know the order of priority between operators. To ensure that the program runs as the desired.

Notes

Summary



0m 04s

# Ordering and logic

>	>=	<	<=	==	~=	&&	
larger than	larger than equal to	less than	larger than equal to	equal	different	and	or

X	~X	Y	X  Y	X&&Y	xor(X,Y)
True	False	True	True	True	False
False	True	True	True	False	True
False	True	False	False	False	False

MATLAB and Octave for beginners

Logical operations have a have as a result true or false. We can compare numbers or also associate relations.

Notes

Summary



0m 41s

# Ordering and logic

>	>=	<	<=	==	~=	&&	
larger than	larger than equal to	less than	larger than equal to	equal	different	and	or

X	~X	Y	X  Y	X&&Y	xor(X,Y)
True	False	True	True	True	False
False	True	True	True	False	True
False	True	False	False	False	False

MATLAB and Octave for beginners

for example you can check whether b is greater than 0 the logical operations can be summarized as as follow yeah, larger than larger than or equal to less than less than or equal to equal, so here you see is a double equal sign okay If you say e equal to 3 with one just once sign than it sets e equal to 3 If you just want to compare a and 3 than you have to use the double equal sign.

Notes

Summary



0m 50s

# Ordering and logic

>	>=	<	<=	==	~=	&&	
larger than	larger than equal to	less than	larger than equal to	equal	different	and	or

X	~X	Y	X  Y	X&&Y	xor(X,Y)
True	False	True	True	True	False
False	True	True	True	False	True
False	True	False	False	False	False

MATLAB and Octave for beginners

We have a different so we have this sign symbols and then and or or and you have to use a double symbol Here is the table with the results of the logical operations okay, so for example is x is true then not x is false.

Notes

Summary



1m 28s

# Ordering and logic

>	>=	<	<=	==	~=	&&	
larger than	larger than equal to	less than	larger than equal to	equal	different	and	or

X	~X	Y	X  Y	X&&Y	xor(X,Y)
True	False	True	True	True	False
False	True	True	True	False	True
False	True	False	False	False	False

MATLAB and Octave for beginners

okay this tilde means not x, if x is false then not x is true we have also this double bar which means or and we have and or we have xor so if x and y are true then xor x and y is false If one of them is true and the other is false then results of xor is true.

Notes

Summary



1m 50s

# Priority

Definition	Or	And	Relation	column	Addition Substraction	Multiplication Division	Negation	Transpose Power	Parantheses
=		&&	<<= == >>= ~=	:	+ -	* / \	~	' ^	( )

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The order of operations allow us to simplify writing without always putting parenthesis. Of course parenthesis are always given the priority. Then there is the transpose and the power negation, duplication and revision and so on until the definition. So these tables summarizes from right to left the priorities in operations.

Notes

Summary



2m 21s

# if – elseif – else

```
>> edit iftest.m
>> iftest(3,4)
a est plus petit que b
>> iftest(4,3)
>> |
```

Command Window

GUI

```
1 function [] = iftest(a, b)
2 % iftest verifie si a plus petit que b
3
4 if (a < b )
5     disp('a est plus petit que b')
6
7 end
8
9
10
```

MATLAB and Octave for beginners

Let's see now how to use if-else. We will build a simple little function that we call okay edit if test so this is the name of my function dot m okay and I just saw before that to define a function I have to use the keyword function. Then I have to put the outputs so this time I don't want any output so I can see either bracket with nothing inside or just remove these brackets in the equal than the name of the function if test and then I have to give the two inputs like a and b. so, I command here my function okay this function test whether a is smaller than b first thing I do is to call if so this if is a result board that helps us doing this condition of statement so if a is smaller than b than what you want to do while we display a sentence saying simply a is smaller than b okay and this is a string then I can close then I can say end so I can just seem to do an if statement and run the script I save and then I run a test I have to remember that I have to give two entries so 3 and 4 and of course a is smaller than b here so the first is smaller than the second 4, 3 so if test for 3 and then there is nothing appears so I have to code the something else to be able to have another answer when I have a that a is larger or equal than b so before the end now I use the keyword else.

Notes

Summary



2m 46s



# if – elseif – else

```
>> edit iftest.m
>> iftest(3,4)
a est plus petit que b
>> iftest(4,3)
>> iftest(3,4)
a est plus petit que b
3 < 4
>>
```

Command Window

GUI

```
1 function [] = iftest(a, b)
2 % iftest verifie si a plus petit que b
3
4 if ( a < b ) % ici commence le bloc des commandes
5 % a executer si la condition est remplie
6 disp('a est plus petit que b')
7 disp([num2str(a) ' < ' num2str(b)])
8 end % termine le bloc du if
9
10 if ( a>0 && (b>0) )
11 disp('Les deux nombres sont positifs')
12 end
13
14
```

Line: 11 Col: 41

MATLAB and Octave for beginners

okay, so here so here starts the block of the positive if okay so from here on it is executed if a is smaller than b and then if I say end here all the if statement is finished OK the block of the if is closed okay, between these two I can put if else okay first let me write something more I want to write exactly what is the condition not just a smaller than b but I want to write down what is a so I write this concatenation of the string converted from a then the small sign and then b but I have to again converted to string concatenate and close parenthesis and now I can save and run a if I can call the function if test 3 and 4, a is smaller than b and indeed 3 is smaller than 4. Now I can use other conditions with the if, say if a is larger than zero and b is greater than zero okay so between the two I have to say to put the and symbol twice this means if both conditions are met then I want to do something so here I have all my block of commands between the if and the end. and yeah I will just like to say both numbers are positive so I display a string saying both numbers are positive. and I save and I can run my test there I can call my function if test and here it is.

Notes

Summary



4m 48s

# if – elseif – else

```
>> edit iftest.m
>> iftest(3,4)
a est plus petit que b
>> iftest(4,3)
a est plus petit que b
3 < 4
>> iftest(3,4)
a est plus petit que b
3 < 4
Les deux nombres sont positifs
>> iftest(4,3)
Les deux nombres sont positifs
>> iftest(-3,-4)
>>
```

Command Window

GUI

```
1 function [] = iftest(a, b)
2 % iftest verifie si a plus petit que b
3
4 if ( a < b )
5     disp('a est plus petit que b')
6     disp([num2str(a) ' < ' num2str(b)])
7 else % bloc a executer si a >= b :
8     disp('')
9
10 end
11
```

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Now if I run the test or I run this function it just 4 and 3 only the second display is shown. If I run if test with minus 3 minus 4 nothing is written because there is a this two if statements that are both false, so no need to do that. Now I want to bring something on screen even if a is larger or equal to b. So what should I do I have used else keyword so else means otherwise so if the condition above is not then met then we want to do something else so here is what we want to do. Okay, the block this is executed if a is larger or equal to b. It's starting here. So here we can say simply a is greater than b or actually is larger or equal to.

Notes

Summary



# if – elseif – else

```
>> edit iftest.m
>> iftest(3,4)
a est plus petit que b
>> iftest(4,3)
a est plus petit que b
3 < 4
>> iftest(3,4)
a est plus petit que b
3 < 4
Les deux nombres sont positifs
>> iftest(4,3)
Les deux nombres sont positifs
>> iftest(-3,-4)
a est plus grand ou egale a b
>> iftest(-3,-3)
a est egale a b
>> iftest(-3,-4)
a est plus grand que b
>>
```

Command Window

GUI

```
1 function [] = iftest(a, b)
2 % iftest verifie si a plus petit que b
3
4 if ( a < b )
5     disp('a est plus petit que b')
6     disp([num2str(a) ' < ' num2str(b)])
7 elseif ( a == b )
8     disp('a est egale a b')
9
10 else % bloc a executer si a >= b :
11     disp('a est plus grand que b')
12
13 end
14
```

MATLAB and Octave for beginners

Okay, so now If we say when we call this function with this with argument minus 3 minus 4 then it says indeed a is larger or equal to b so this is the else statement here we got if else statement We can also add an additional if, we can say else if there is a statements that are checked one after the other but once one statement is true then we only execute the block after that so if a is equal to b,we say display a equal to b and then we have the else block when here we have to remove this or equal it just have to say a is larger than b okay we have the three cases and all of them are separated by if else if else and then we can test our function if we call this minus three minus three then we have that a is equal to b If we test this minus 3 minus 4 a is larger than b and so on.

Notes

Summary



8m 28s

# Switch – case – otherwise

```
>> edit switchTest.m
>> 
```

Command Window

GUI

```
1 function [grade] = switchTest (points)
2 % switchTest rend la note correspondante au nombre des points
3
4 if (points < 0 ) || ( points > 10)
5     grade = 'NA';
6     return
7 end
8
9
10
11 endfunction
12
```

MATLAB and Octave for beginners

To control the flow of a program you can also use the keyword switch. How does it work? I still have a function and now I prepare it in advance. At least the basics So I would like a switch test given number of points. It gives me grade of a student. First we need to control that the number of points is positive and smaller than 10 So I put here some if lets see what we want to write. If the points are larger than zero or so this double vertical bar which is not always easy to find depends on your keyboard so points are than zero or points are larger than 10 oops here I wanted so points are smaller than zero or the point are larger than 10 Then I should display something or something is wrong here okay so somebody call this function within wrong number of points so I just say okay grade is equal Na so not acquired so it's a string and then I just stop the function To stop this function I can use the keyword return okay so, if I arrive at this point and I have a return the function we just stopped then return grade equal to Na stop it there return So we stop immediately the function with this return and then I can say and so this if is finished I still have to code everything well, even if there is a return statement.

Notes

Summary



9m 51s

# Switch – case – otherwise

```
>> edit switchTest.m
>> |
```

Command Window

```
1 function [grade] = switchTest (points)
2 % switchTest rend la note correspondante au nombre des points
3
4 if (points < 0 ) || ( points > 10)
5     grade = 'NA';
6     return
7 end
8
9 switch points
10 case {9,10}
11     grade = '6';
12 case 8
13     grade = '5.5';
14 case 7
15     grade = '5';
16 otherwise
17     grade = '3';
18
19 endfunction
20
```

MATLAB and Octave for beginners

I still have to really write down properly my if statement and now I can do a switch, so a switch is a series of checks on a variable. So I have to give a variable so here is point I'd switch depending on the value of point has several cases. this vice is called case. So the case that I have 9 points or 10 points well the grade is a obviously the grade is equal to Na. So here you see that I have a two possible cases points equal to 9 or 10 and then I give the grade 6 or a so I switch to none so 6 is as same as a 9. Then I have another case case 8 and then I have to say what is the grade in this case I would say that these in switch are like 5 dot 5. okay if you have eight points similar to 5 dot 5 grade equal to the string 5 dot 5 so every time I do a small block This small block is performed until a next case It's a little bit different than for example in c okay here the block is executed only between the cases. then I have the case seven and the grade is five and so on but in the end for somebody who has less than seven points while I am not happy I just say otherwise that means If none of them above applies then I give grade equal to three a so this otherwise collects the cases that are not mentioned before.

Notes

Summary



11m 46s

# Switch – case – otherwise

```
>> edit switchTest.m
>> switchTest(9)
ans = 6
>> switchTest(-2)
ans = NA
>> switchTest(7)
ans = 5
>>
```

Command Window

```
1 function [grade] = switchTest (points)
2 % switchTest rend la note correspondante au nombre des points
3
4 if (points < 0 ) || ( points > 10)
5     grade = 'NA';
6     return
7 end
8
9 switch points
10 case {9,10}
11     grade = '6';
12 case 8
13     grade = '5.5';
14 case 7
15     grade = '5';
16 otherwise
17     grade = '3';
18 end
19
20 end
21
```

GUI

MATLAB and Octave for beginners

and then I can end the switch so I have to do end and this end is finishing this switch and I can save my function I will move this function characters there are useless So I can run my function switch this nine and then the answer is six. They say if I use my function with an input minus two then the note the grade is Na five seven points my grade is five.

Notes

Summary



14m 14s

## 4.2 Conditional statements



The flow of operations can be control with the keyword if, else or switch which is the less sophisticated but sometimes of lighter to use These are the first programming elements. This next step is to use loops, to repeat the block of code several times.

Notes

Summary



14m 55s