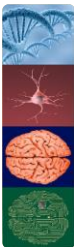



Introduction to Programming 2017/2018

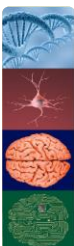
Tirgul 3: Flow control

Michal Israelashvili
Yocheved Loewenstern



Lesson Outline

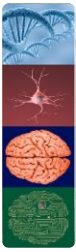
- Logical expressions and operations
 - Truth tables
 - Boolean algebra
- Conditioning:
 - if
 - Switch
- Repetitions:
 - For
 - while



Logical expressions and operations

- Based on Boolean Algebra.
- There is no meaning to the numeric value – only to the truth value, which can be either 0 (false) or 1 (true). For example:


```
logical([0,1,2,5,0,-5]) =
[false, true, true, false, true] =
[0, 1, 1, 0, 1]
```
- We can use the logical operators (not, and, or, and their combinations) to create expressions of truth values (logical expressions).



Truth tables

AND: $\&$

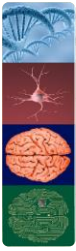
X	Y	Ans
1	1	1
1	0	0
0	1	0
0	0	0

OR: $|$

X	Y	Ans
1	1	1
1	0	1
0	1	1
0	0	0

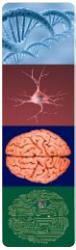
NOT: \sim

X	Ans
1	0
0	1



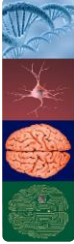
Boolean algebra

- Bitwise logical operations:
 - $1110 \& 1011 = 1010$
 - $1110 | 1011 = 1111$
 - $\sim 1010 = 0101 = 101$



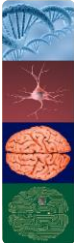
Conditioning – if, switch

- Logical conditions and operations can be used to performed conditional execution of a code.
- The general idea:** a piece of code is executed only if a logical expression (condition) is true (i.e. has truth value of 1).



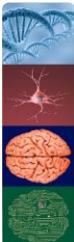
Conditioning – if, switch

- Matlab examples:
 - IfElseScript
 - IfNestedScript
 - SwitchScript



The importance of indentation

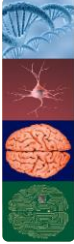
- ifIndent.m
- Use Ctrl+I to automatically add indentations to your scripts.



Edge cases

- A program should handle all the possible cases/inputs.
- Edge case - a case/input that occurs only at an extreme (maximum, minimum, rare cases, etc.).

→ Test all the cases that your program should handle.



Repetitions – for, while loops

- ForScript.m
- ForNestedScript.m
- ForDeclaration.m
- WhileScript.m
- forScript_comment - demonstrates use of comments in a script.



Functions/Commands List

- and (&), or (|), not (~)
- =, >, <
- if, else, elseif
- switch, case, otherwise
- for
- while