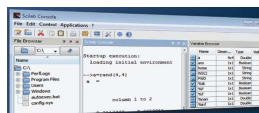


## CISC 3250 Systems Neuroscience

### Scilab



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## Access to Scilab

Laptop/home computer:

- <http://www.scilab.org/>

Lab computer:

- Open terminal
- `cd Downloads/scilab/bin`
- `./scilab`

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## Commands

Symbols and keywords cause actions

- `b=2` *creates variable b with value 2*
- `d=b+5` *creates variable d with value computed by adding 5 to value of b*
- `exit` *closes program*

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## Variables

**Variables store information**

- Letters  
`neuronType='purkinje';`
- Single Number  
`numberOfDendrites=1000;`
- Group of numbers, in `[]` brackets  
`potentials=[-65 -64 -63.9 -62.8 -61.6];`

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## Variable names

- A variable name is any valid identifier
  - Starts with a letter, contains letters, digits, and underscores (`_`) only
  - Cannot begin with a digit
  - Case sensitive:  
`username#userName#UserName`

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## Data

Data can be read from files

- `loadmatfile('classExample.mat');`
- `savematfile('classExample2.mat','c','d');`

Data is analyzed through commands

- `numberOfSpikes=sum(spike_record);`
- `plot(spike_record)`

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## Standard arithmetic

### Operators

- Addition:  $5 + 2$  evaluates to 7
- Subtraction:  $5 - 2$  evaluates to 3
- Multiplication:  $5 * 2$  evaluates to 10
- Division:  $4 / 2$  evaluates to 2
- Exponent:  $5 ^ 2$  evaluates to 25

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## Vector arithmetic

- Vector is list of numbers in between [ ]
- Can replace one of operands with a vector  
 $2+[3\ 4\ 1]$  yields  $[5\ 6\ 3]$
- Can place results into new variable  
`Variable_Name=number*vector;`
- Both operands can be vectors, but special rules apply

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## The semi-colon ;

- Each command can optionally end with ;
- semi-colon prevents result display

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## Accessing vector elements

- ```
a=[2.2 1.4 -5 3.5 -7.8];
```
- name accesses full vector  
a
  - name(index) accesses single element  
a(4) returns 3.5
  - name(index1:index2) accesses set of elements  
a(2:4) returns [1.4 -5 3.5]

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## Saving results

- Save graphics with File -> Export -> [PNG, JPG, GIF, PNG]

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