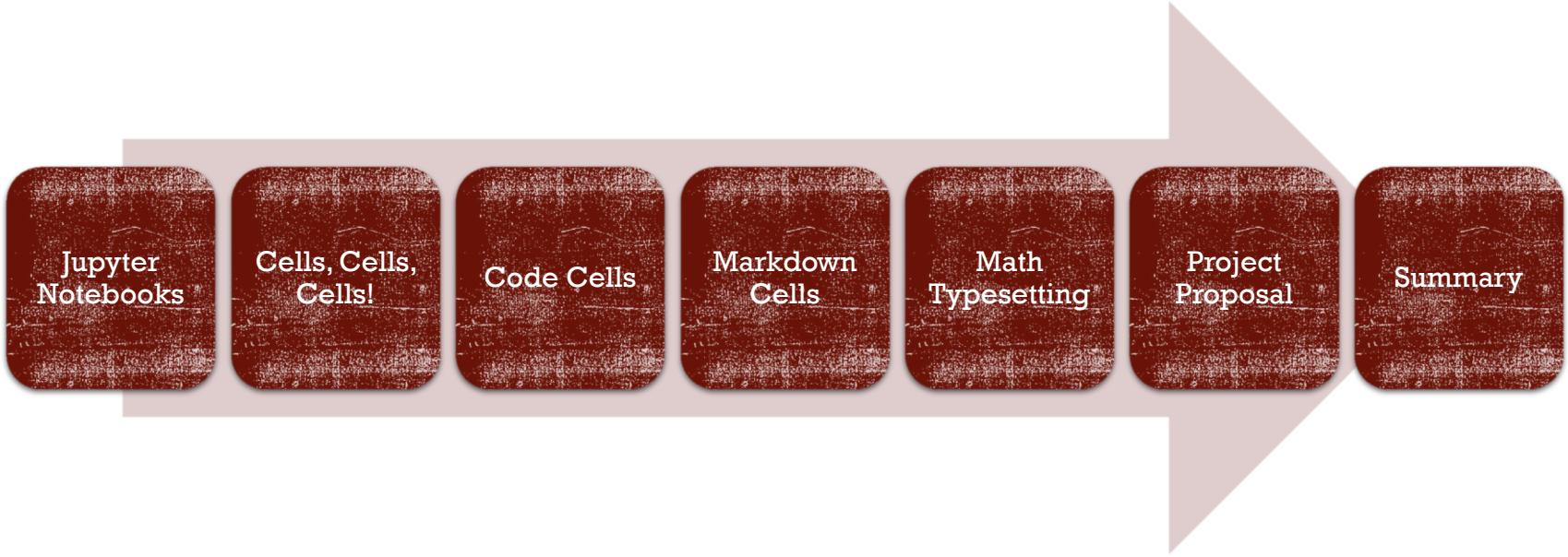
DECISION SUPPORT SYSTEMS

ESI4628
Dr. Ivan Garibay
University of Central Florida

PYTHON WITH JUPYTER NOTEBOOKS

OVERVIEW


Jupyter Notebooks
Cells, Cells, Cells!
Code Cells
Markdown Cells
Math Typesetting
Project Proposal
Summary

COMPUTERS YES!, BUT PROGRAMMING?

https://www.youtube.com/watch?v=PF7EpEnglgk

CELLS

Everything in a Jupyter Notebook is a "CELL"

CODE CELLS

Code cells are for typing code in Python:

```
In [5]: cars = ["Ford", "Volvo", "BMW"]
        print(cars)

        ['Ford', 'Volvo', 'BMW']
```

MARKDOWN CELLS

Markdown cells are for typing comments in English:

The non-primitive data structures in Python are divided into:

- Arrays
- Lists

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SHIFT + RETURN = EXECUTE CELL

Before

```
In [ ]: print ("Hello!!!")
```

After

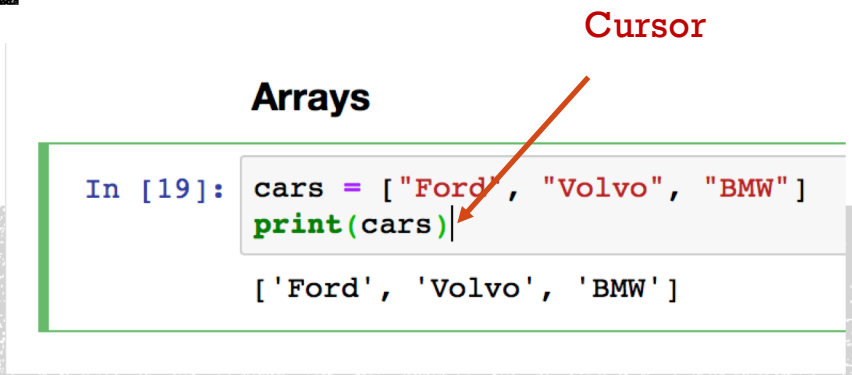
```
In [6]: print ("Hello!!!")
        Hello!!!
```

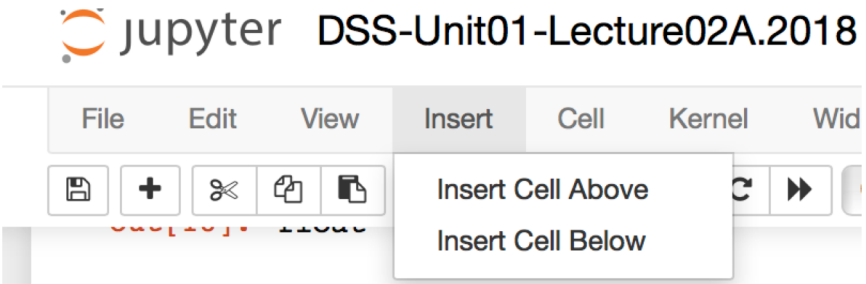
9 SHIFT + RETURN = EXECUTE CELL

Before

After

DOUBLE CLICK= EDIT CELL





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INSERT CELL = MORE CELLS!

Before

```
In [6]: print ("Hello!!!")
        Hello!!!
```

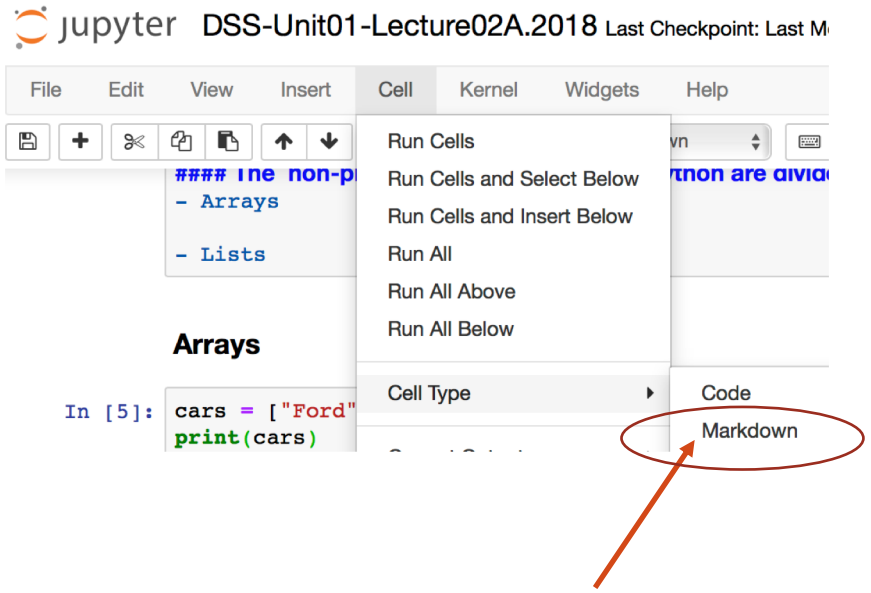
After

```
In [6]: print ("Hello!!!")
        Hello!!!

In [ ]:
```

New Cell

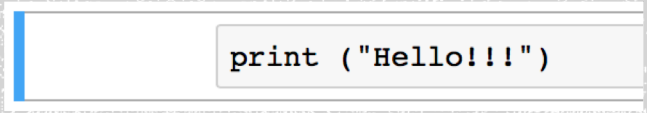
12 CELL TYPES



Select Cell Type

Before

After



EDITING MARKDOWN CELLS: TEXT

```
Just type!

If you want headers, just use '# ' for

# Title/Sections

## Sub sections

### event smaller headings

__Bold face__ (enclose text with two underscores)
or _italic fonts_ (single underscore) are easy.

Bulleting lists are also simple, just use '-' as follows:
- first item in list
- second item in list
- etc. etc.
```

Just type!

If you want headers, just use '# ' for

Title/Sections

Sub sections

event smaller headings

Bold face (enclose text with two underscores) or *italic fonts* (single underscore) are easy.

Bulleting lists are also simple, just use '-' as follows:

- first item in list
- second item in list
- etc. etc.

EDITING MARKDOWN CELLS: TYPESETTING MATH

```
Just type:

x=100

Math looking good (use '$' to surround your math):

$x=100$

Use '^' for exponents:

$x^2+4x+c=100$

Typesetting Math can get addictive really easy:

\begin{equation*}
\left( \sum_{i=1}^n a_i b_i \right)^2 \leq \left(
\sum_{j=1}^n a_j^2 \right) \left( \sum_{j=1}^n b_j^2 \right)
\end{equation*}

More information at:<br>
https://jupyter-
notebook.readthedocs.io/en/stable/examples/Notebook/Typesett
ing%20Equations.html# <br>
https://www.mathjax.org
```

Just type:

x=100

Math looking good (use '$' to surround your math):

$x = 100$

Use '^' for exponents:

$x^2 + 4x + c = 100$

Typesetting Math can get addictive really easy:

$$\left(\sum_{i=1}^n a_i b_i \right)^2 \leq \left(\sum_{j=1}^n a_j^2 \right) \left(\sum_{j=1}^n b_j^2 \right)$$

More information at:
https://jupyter-notebook.readthedocs.io/en/stable/examples/Notebook/Typesetting%20Equations
https://www.mathjax.org

PROJECT PROPOSAL (DUE 9/4/2018)

1. project title
2. group members (exactly 5 students)
3. project description, what are you doing? (~1/2 page)
4. Project justification, why are you doing it? (~1/2 page). Include one or two citations from scientific literature or industry.
5. Public data set you are planning to use (provide link to online repository of data) and description (1/4 page)
6. Method you going to use (tentative, it can be changed). Select methods from (or any other in textbook):
   - Mathematical Modeling
   - Statistical Modeling
   - Machine Learning Modeling

SUMMARY

- Jupyter Notebooks are an interactive, versatile way to combine programs and text
- Cells are components of a Notebook
- Code Cells are for code, in our case Python code
- Markdown Cells are for text in English or Math
- Execute, Edit, Insert Cells
- Editing Markdown Cells: Text
- Editing Markdown Cells: Math
- Project Proposal

ANNOUNCEMENTS

- **Project Proposal Due: 9/4/2018**
- Submit
  1. project title
  2. group members (exactly 5 students)
  3. project description (1/2 page to 1 page)
  4. Public data set you are planning to use (provide link to online repository of data) and description (1/4 page)
  5. Method you going to use (tentative, it can be changed). Select method from (or any other in textbook):
     - Mathematical Modeling
     - Statistical Modeling
     - Machine Learning Modeling

The tree that never had to fight
For sun and sky and air and light,
But stood out in the open plain
And always got its share of rain,
Never became a forest king
But lived and died a scrubby thing.

-**Good Timber**
By Douglas Malloch

THANKS