CS 160
CS Orientation

Data Types, Conditionals, and Repetition
Hierarchy of Operations

- Functions, i.e. math.sqrt()
- Power
- Mod
- Mult, Div
- Add, Sub
- Relational
- Logical

(binary) 2 operands / (unary) 1 operand

How many operands?
Python Examples

• 5 * 2 + 3 - 10
• 5 * (2 + 3) - 10
• 3 > 2 + 4
• Etc.
Data Types/Converting

- string - “string of text”
- character – ‘a’
- integer – 79
- boolean – True
- float – 79.0
How about storing values?

- ch = ‘a’
- num = 79
- cont = True
- num = num + 1
- Can we mix types?
  - num = num + continue
  - num = num + ch
  - ch = ch + num

Type casting
Sequential Logic Structure

<table>
<thead>
<tr>
<th>Algorithm</th>
<th>Flowchart</th>
<th>Pseudocode</th>
</tr>
</thead>
</table>
|           | ![Flowchart Diagram] | Instruction  
Instruction  
Instruction  
Instruction  
|           |           | Instruction  |

5. Instruction  
6. Instruction  
7. Instruction  
8. Instruction
Python Sequential Logic

print("   *   ")
print("  ***  ")
print(" ***** ")
print("*******")
Decision Logic Structure

<table>
<thead>
<tr>
<th>Algorithm</th>
<th>Flowchart</th>
<th>Pseudocode</th>
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<tbody>
<tr>
<td>5. If &lt;decision&gt; then Instruction else Instruction</td>
<td>Decision Instruction</td>
<td></td>
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<tr>
<td>6. :</td>
<td>Instruction F</td>
<td>Instruction T</td>
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<td>:</td>
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</table>

If <decision> then Instruction else Instruction Endif

: : :
Relational Operators and Symbols

- >
- >=
- <
- <=
- ==
- !=

All are binary.

Equal to
Not equal to.
Logical Operators and Symbols

- **not**

  - **unary**
    - not T F
    - not F T

- **and**

  - **binary**
    - T and T T
    - T and F F
    - F and T F
    - F and F F

- **or**

  - **short circuit**
    - T or T T
    - T or F T
    - F or T T
    - F or F F
Python Decision Logic:
Print 1, 3, 5, or 7 stars
Differences/Similarities in these?

```python
x=int(input("Print 1, 3, 5, 7 stars?"))); 

if(x==1):
    print("   *   ")
if(x==3):
    print("  ***  ")
if(x==5):
    print(" ***** ")
if(x==7):
    print("*******")
```

```python
if(x==1):
    print("   *   ")
elif(x==3):
    print("  ***  ")
elif(x==5):
    print(" ***** ")
elif(x==7):
    print("*******")
```
Python Decision Logic:
Print 1, 3, 5, or 7 (for any other #) stars
Differences/Similarities in these?

```python
x=int(input("Print 1, 3, 5, 7 stars?")));  
if(x==1):
    print("  *   ");
elif(x==3):
    print("  ***  ");
elif(x==5):
    print("  ***** ");
else:
    print("*******");
```