Spreadsheets 3

Lecture Set 14

Incorporating Functions

- Spreadsheets provide many numeric functions
  - Mathematical functions
    - Log()
  - Average, min, max, sum
  - Apply to a collection of cells
  - Can enumerate as comma-delimited list of cells
  - Can specify a range as start:end

Review

- Cell can hold data (text/number)
- Each cell can be “formatted”
  - Format/Cell in menu
  - Default is based on what you enter the first time
  - Use $, % to set format
  - Calculated cells generally floating point
- Ctrl~ to toggle display of formulas/output
  - Make sure you’re not in “input mode”
    - Hit <Enter> to make sure

Amortized Loans: Solving for $t$

- Let’s rewrite the equation to solve for $t$
  \[
  P = R \left(1 + \frac{r}{n}\right)^{-nt}
  \]
  \[
  \frac{1}{P/R \times (r/n)} = \left(1 + \frac{r}{n}\right)^{nt}
  \]
  \[
  n \log\left(1 + \frac{r}{n}\right) = \log\left(\frac{1}{P/R \times (r/n)}\right)
  \]
  \[
  n \log\left(1 + \frac{r}{n}\right) = \log\left(\frac{1}{P/R \times (r/n)}\right)
  \]
- Again, it helps to compute this in pieces
  - Be careful to
    - Negate values
    - Apply log() to the right values
- We can solve for any variable
  - But each will require a different process

Example Formula Layout

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Inputs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>189/97</td>
<td>in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Principal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Payment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Interest Rate</td>
<td>(log(DF)</td>
<td>Log(Num)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Payments each Year</td>
<td>(log(1+DF)</td>
<td>Log(Num)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Outcome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Length of Loan</td>
<td>3060</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Total Paid</td>
<td>811997</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Total Interest</td>
<td>811.94</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>