CS118
Excel formulas

Excel tutorials:

Writing Excel formulas:	http://tiny.kindy.net/?id=87
Factorials:	http://tiny.kindy.net/?id=85
Summations:	http://tiny.kindy.net/?id=86

· Create an Excel spreadsheet with values for *i* that range from 0 to 4 in column A.

· For the following steps, we will be using the formula shown below.

$$\pi = \sum_{i=0}^{\infty} \frac{(i!)^2 2^{i+1}}{(2i+1)!}$$

The Greek letter sigma (Σ) is used in mathematics to represent repeated addition. The above formula is simplified below for just the first five "terms":

$$\pi \approx \sum_{i=0}^{4} \frac{(i!)^2 2^{i+1}}{(2i+1)!} = \frac{(0!)^2 2^{0+1}}{(2\cdot 0+1)!} + \frac{(1!)^2 2^{1+1}}{(2\cdot 1+1)!} + \frac{(2!)^2 2^{2+1}}{(2\cdot 2+1)!} + \frac{(3!)^2 2^{3+1}}{(2\cdot 3+1)!} + \frac{(4!)^2 2^{4+1}}{(2\cdot 4+1)!}$$

We're going to create a spreadsheet that will calculate this for us. We've broken up the calculation to make it less error-prone in the spreadsheet.

· In column B, compute the NUMERATOR for one term from the summation formula in #1 using the value of *i* that is in column A of the same row (use the `fact()` function to compute factorial).

· In column C, compute the DENOMINATOR for one term from the summation formula in #1 using the value of *i* that is in column A of the same row.

· In column D, compute the result of dividing the value in column B by column C. Note that the value in this column gets smaller as we move down the column.

· Finally, compute the approximation for π in column E. Use the `sum()` function to compute the summation of a range of values from column D – the values in column D from the first row of the series to the current row of the series. Because of the reducing values in column D, the approximation for π gets closer and closer to the actual value. We say that the formula is *converging* on π.

Submit an Excel (or LibreOffice Calc) spreadsheet showing the computations for this problem. The first five rows of a working spreadsheet are shown below:

0	2	1	2	2
1	4	6	0.66666666667	2.66666666666667
2	32	120	0.26666666667	2.93333333333333
3	576	5040	0.11428571429	3.04761904761905
4	18432	362880	0.05079365079	3.0984126984127