Worksheet 21 (Finance 1): Spreadsheets and Interest

Group names: _____

1. Use a spreadsheet to calculate the following quantities:
   (a) $471 + 5619 =$ _____
   (b) $36 * 987 =$ _____
   (c) $45^3 =$ _____(Use syntax `=45^3`)
   (d) $12! =$ _____(Use syntax `=fact(12)`)
   (e) Use a spreadsheet to calculate your total bill if the dinner cost $72.50 and you want to give an 18% tip. _____

2. Use a spreadsheet to calculate the following if you invested $4500 for 10 years, assuming **simple interest**. (Use the process from the lecture notes.)
   (a) how much interest would be accrued if you invested 2%? _____
   (b) How much money did you have at the end of 10 years? _____
   (c) How much interest would you accrue if you invested at 3%? _____
   (d) How much money did you have at the end of 10 years? _____
   (e) How much additional interest did you get in going from 2% to 3%? _____

3. Answer the previous question if you are using **compound interest** (compounded annually) instead.
   (a) how much interest would be accrued if you invested 2%? _____
   (b) How much money did you have at the end of 10 years? _____
   (c) How much interest would you accrue if you invested at 3%? _____
   (d) How much money did you have at the end of 10 years? _____
   (e) How much additional interest did you get in going from 2% to 3%? _____

4. Now we will make a more clever interest calculator.

   i. Make a new sheet in your spreadsheet, called `Interest`.
   ii. In `A1` type `Simple Interest`
   iii. In row 2 make cells A through E contain the words
   year principal interest total interest grand total
   iv. Start column `A2` with 1 and then 2 and fill down until year 10.
   v. In `C1` type `0.06` (this is where we are storing our interest)
   vi. Type `500` into `B3`
   vii. Type `=B$3*C$1` into `C3`.
   viii. In `D3` type `=sum(C$3:C3)`.
   ix. In `E3` type `=B$3+D3`.
   x. Fill down `C3, D3, E3` until year 10

   To convert the long decimals to things that look like currency, you can click on the column header and then click the button that looks like `$` in the toolbar.

   (a) How much interest did you accrue in Year 10? _____

   (b) How much total money did you accrue in Year 10? _____

   (c) Fill down more columns if necessary. At what year will you have more than $1200?

   _____

   (d) At what year will you have accrued more than $500 in interest? _____

5. Answer the previous questions assuming you invested $825 at 2.75% interest using simple interest:

   (a) What two cells do you need to update to make this change?

   Cell _____should change to _____

   Cell _____should change to _____

   (b) How much interest did you accrue in Year 10? _____

   (c) How much total money did you accrue in Year 10? _____

   (d) Fill down more columns if necessary. At what year will you have more than $1200?

   _____

   (e) At what year will you have accrued more than $500 in interest? _____

6. We will next make a more clever compound interest calculator by copying the simple interest calculator and updating some cells.

   (i) Select your simple interest spreadsheet cells, copy them, click on cell `G1` and hit paste.

   (ii) Change the title to **Compound Interest**

   (iii) Change your cell values so `I1` contains `0.06` and `H3` contains 500.

   (iv) Type `=H3*I$1` into `I3`.

   (v) Type `=H3+I3` into `H4`.

   (vi) Type `=H4*I$1` into `I4`.

   (vii) Now select cells `H4, I4` and fill them down. Columns J and K should update automatically.

   (viii) If you like, select columns `H,I,J,K` and turn them into currency by clicking the $ in the toolbar.

   Answer the following questions about compound interest, investing $500 compounded annually at a rate of 6%:

   (a) How much interest did you accrue in Year 10? _____

   (b) How much total money did you accrue in Year 10? _____

   (c) How much more money did you accrue in Year 10 than from simple interest? _____

   (d) Fill down more columns if necessary. At what year will you have more than $1200? _____

   (e) How did this answer differ from your simple interest answer? _____

   (f) At what year will you have accrued more than $500 in interest? _____

   (g) How did this answer differ from your simple interest answer? _____

7. Now answer the previous questions about compound interest assuming you invested $825 at 2.75% interest:

   (a) What two cells do you need to update to make this change?
   Cell _____ should change to _____
   Cell _____ should change to _____

   (b) How much interest did you accrue in Year 10? _____

   (c) How much total money did you accrue in Year 10? _____

   (d) Fill down more columns if necessary. At what year will you have more than $1200? _____

   (e) At what year will you have accrued more than $500 in interest? _____