Navigating spreadsheets

INTRODUCTION TO SPREADSHEETS

James Chapman
Curriculum Manager, DataCamp

datacamp

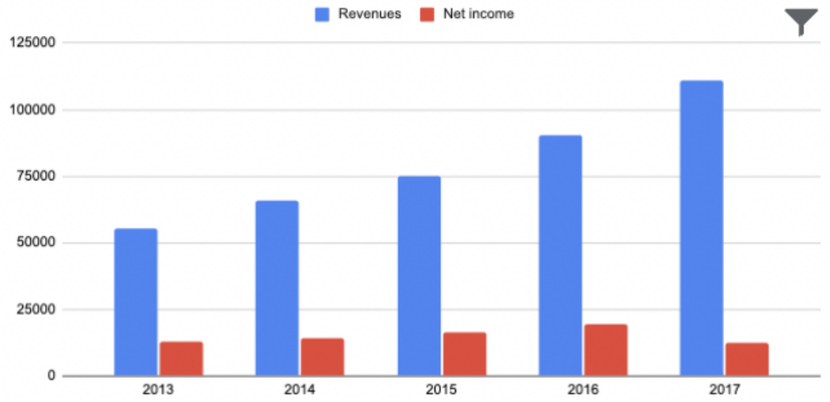
Spreadsheets

- Millions of users worldwide
- Intuitive interface
- Extract insights with a few clicks!

Income statement

$ in millions

	2013	2014	2015	2016	2017
Revenues	**55,519**	**66,001**	**74,989**	**90,272**	**110,855**
Cost of revenues	21,993	25,691	28,164	35,138	45,583
Research and development	7,137	9,832	12,282	13,948	16,625
Sales and marketing	6,554	8,131	9,047	10,485	12,893
General and administrative	4,432	5,851	6,136	6,985	6,872
European Commission fine	0	0	0	0	2,736
Total costs and expenses	**40,116**	**49,505**	**55,629**	**66,556**	**84,709**
Income from operations	15,403	16,496	19,360	23,716	26,146
Other income (expense), net	496	763	291	434	1,047
Income before income taxes	15,899	17,259	19,651	24,150	27,193
Provision for income taxes	2,739	3,639	3,303	4,672	14,531
Net income	**12,733**	**14,136**	**16,348**	**19,478**	**12,662**
Less: Adjustment Payment to Class C capital stockholders	0	0	522	0	0
Net income available to all stockholders	**12,733**	**14,136**	**15,826**	**19,478**	**12,662**



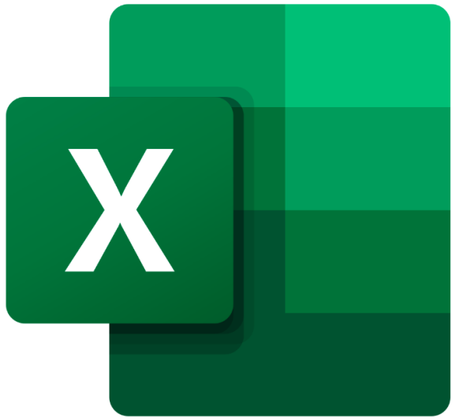
[1] Annual financial data template from Google Sheets

Spreadsheet software

Google Sheets

- Supports live collaboration
- Completely free!
- **Used throughout this course**

Microsoft Excel



- Supports live collaboration
- Limited free version
- Integrates well with other Microsoft Products, including Power BI

Coming up...

Chapter 1

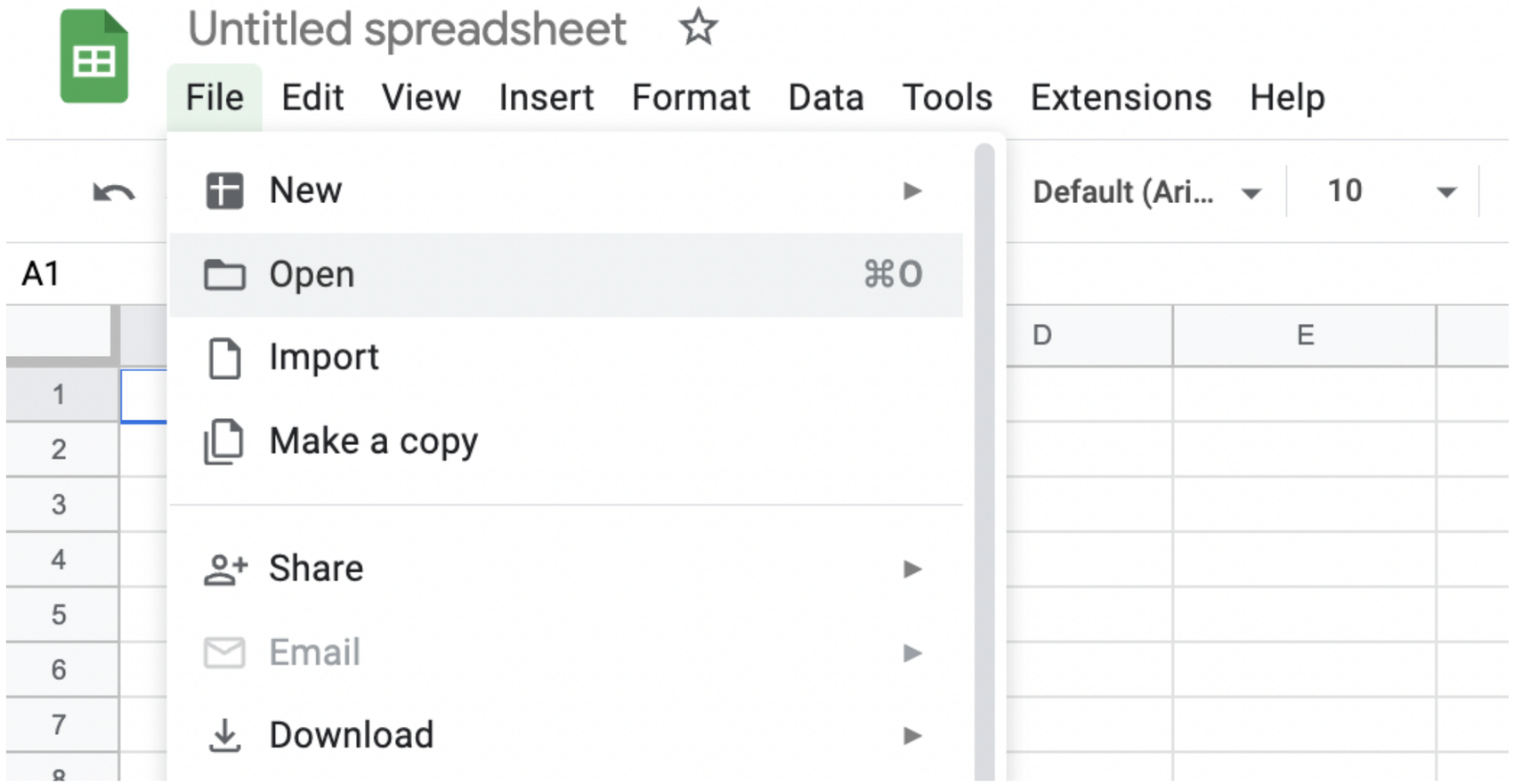
- Adding data to spreadsheets
- Creating formulas
- Formatting cells

Chapter 2

- Cell references
- Including cell references in formulas
- Absolute references

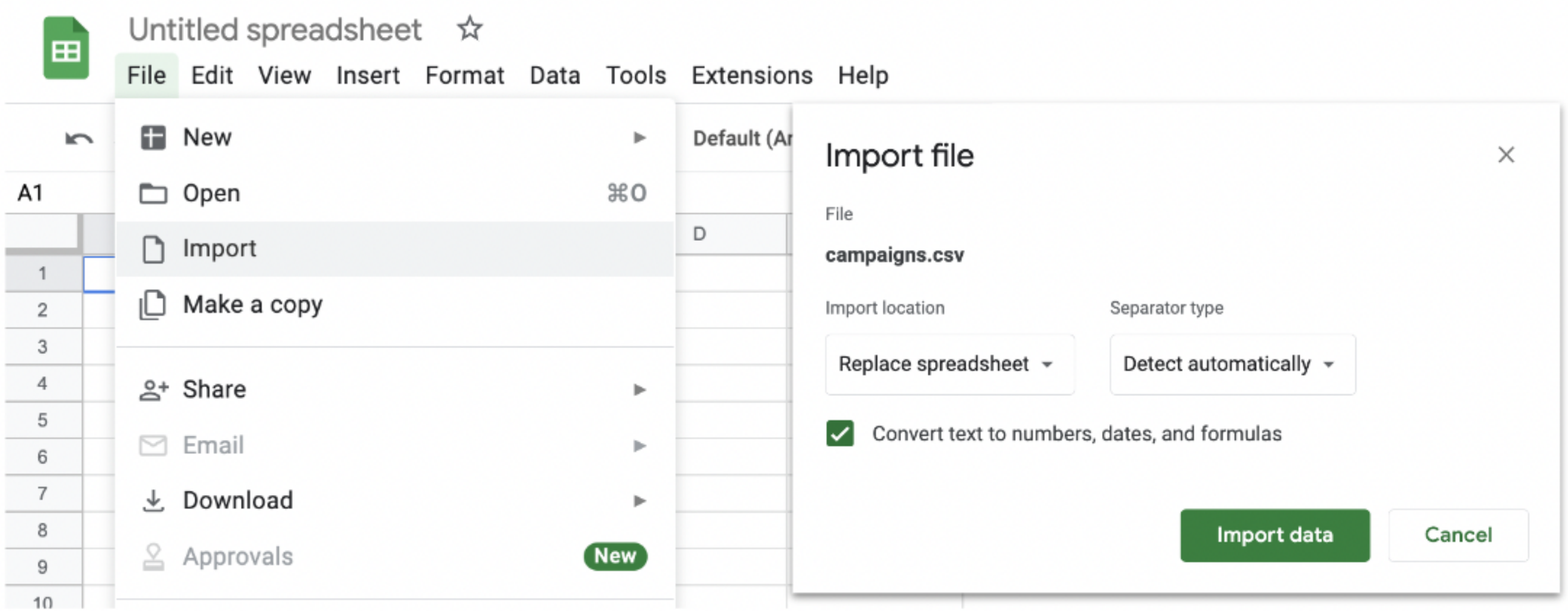
Opening spreadsheets

- To open an existing spreadsheet: File > Open



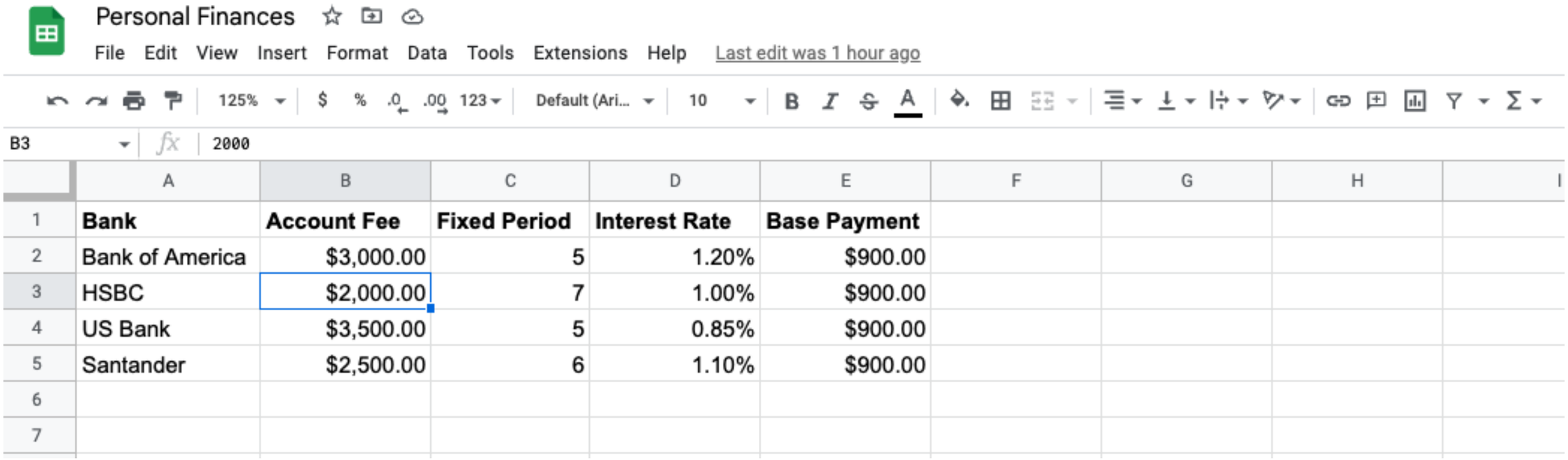
Importing data

- To import data: File > Import
- Can import many different file types, including: `.csv` , `.txt` , `.tsv` , `.xlsx`



Navigating spreadsheets

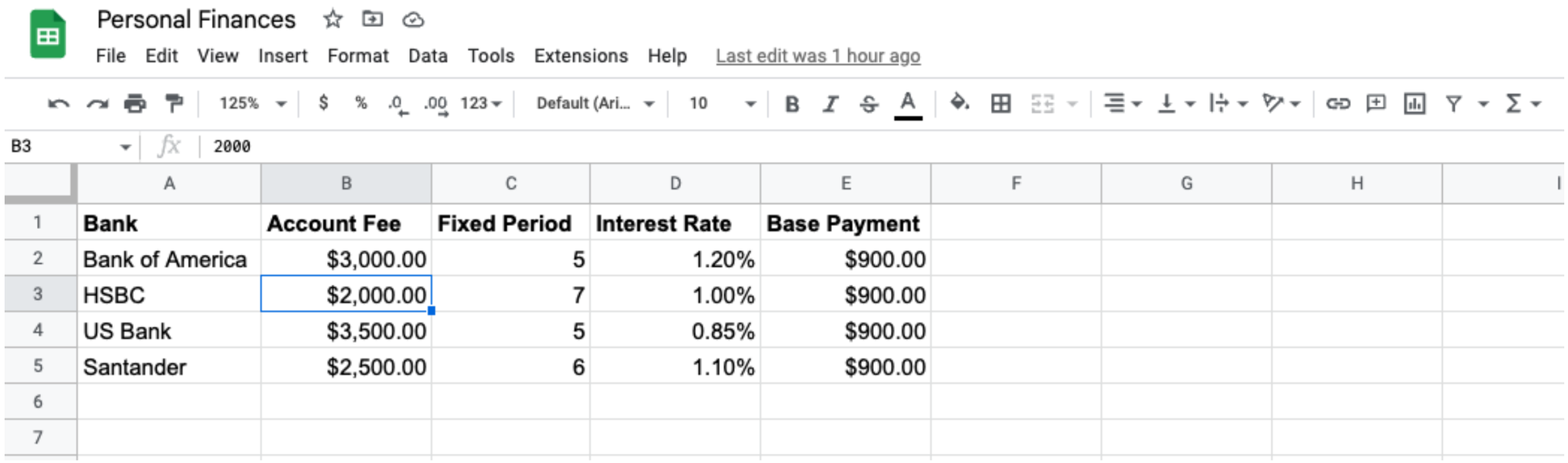
- Spreadsheets store **tabular data**
- Data is stored in individual **cells**
- Cells can contain data or perform calculations



	A	B	C	D	E	F	G	H	I
1	**Bank**	**Account Fee**	**Fixed Period**	**Interest Rate**	**Base Payment**				
2	Bank of America	$3,000.00	5	1.20%	$900.00				
3	HSBC	$2,000.00	7	1.00%	$900.00				
4	US Bank	$3,500.00	5	0.85%	$900.00				
5	Santander	$2,500.00	6	1.10%	$900.00				
6									
7									

Cell addresses

- Cells can be *uniquely identified* by a column (letters) and row label (numbers)
- **Cell addresses** combine the column and row label
- Example: the value of $2,000 is found in cell `B3`



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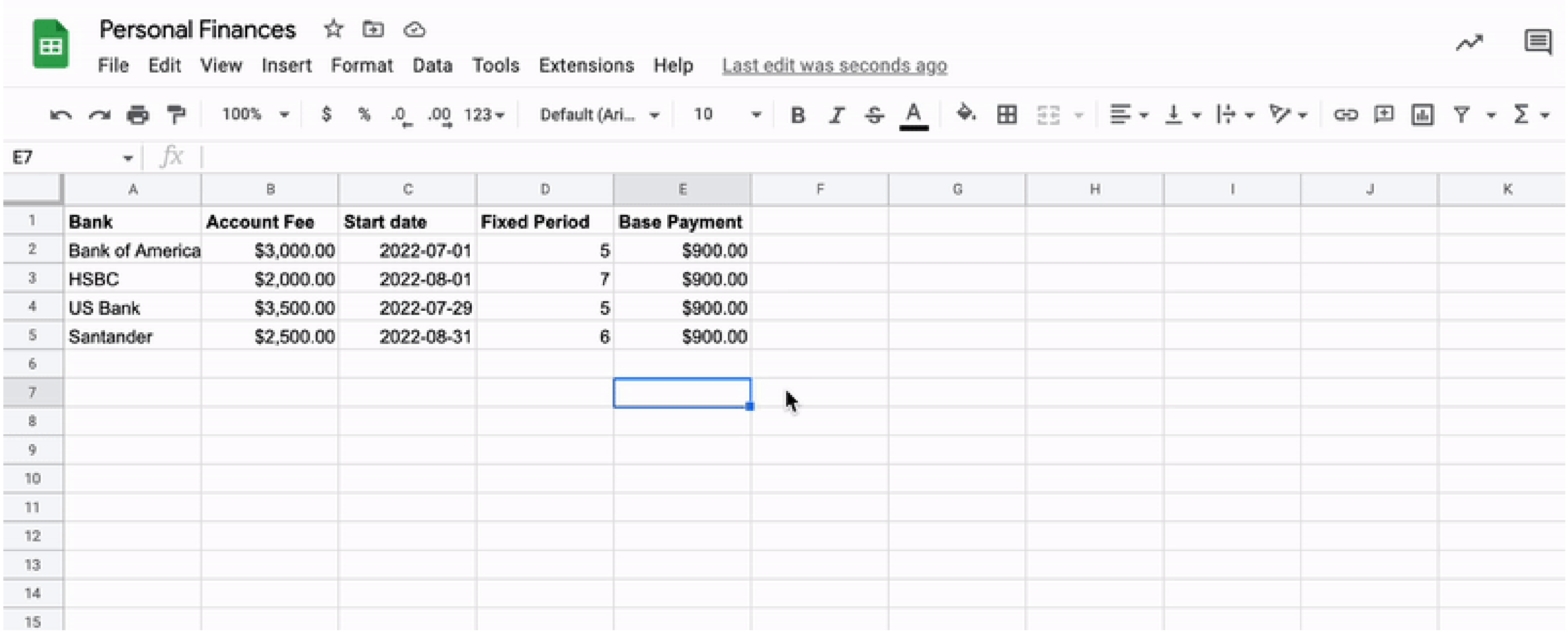
Adding and amending data

- Select the cell to add or amend, and type the new value



	A	B	C	D	E	F	G	H	I	J	K
1	**Bank**	**Account Fee**	**Start date**	**Fixed Period**	**Base Payment**						
2	Bank of America	$3,000.00	2022-07-01	5	$900.00						
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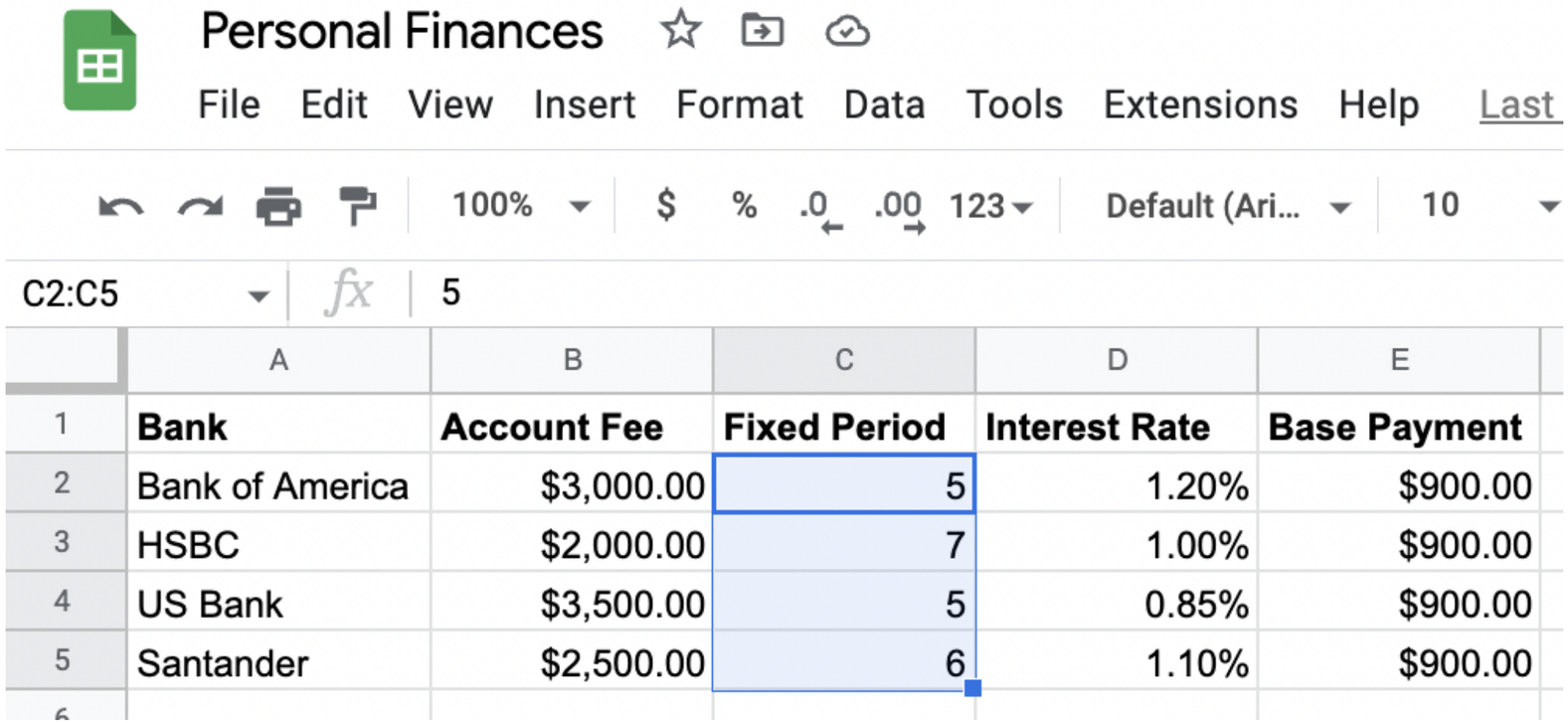
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											

Cell ranges

- A **cell range** defines a rectangular group of cells
- Example: Column `C` between rows `2` and `5` → `C2:C5`



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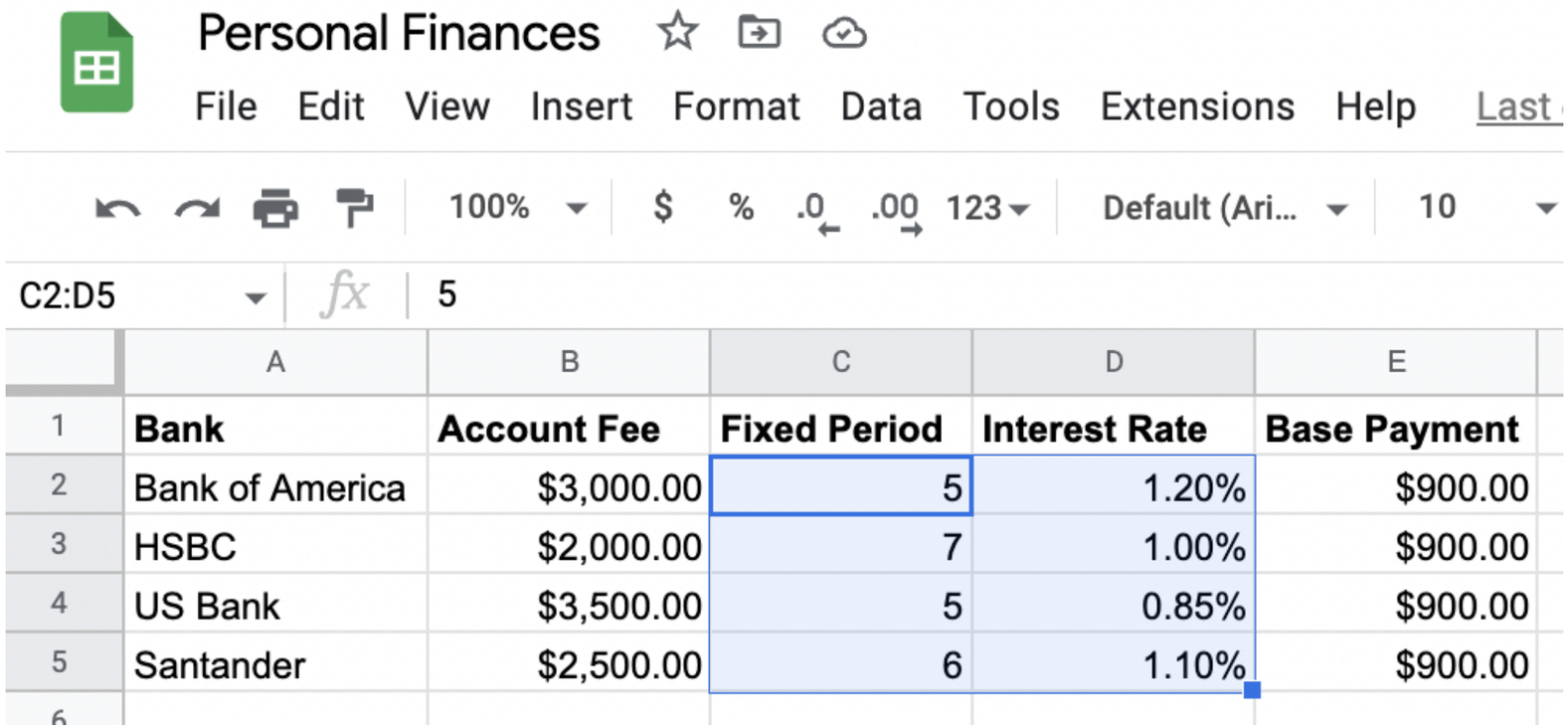
Cell ranges

- For groups across columns, define the range from *top-left* to *bottom-right*
- Example: Columns `C` and `D` between rows `2` and `5` → `C2:D5`



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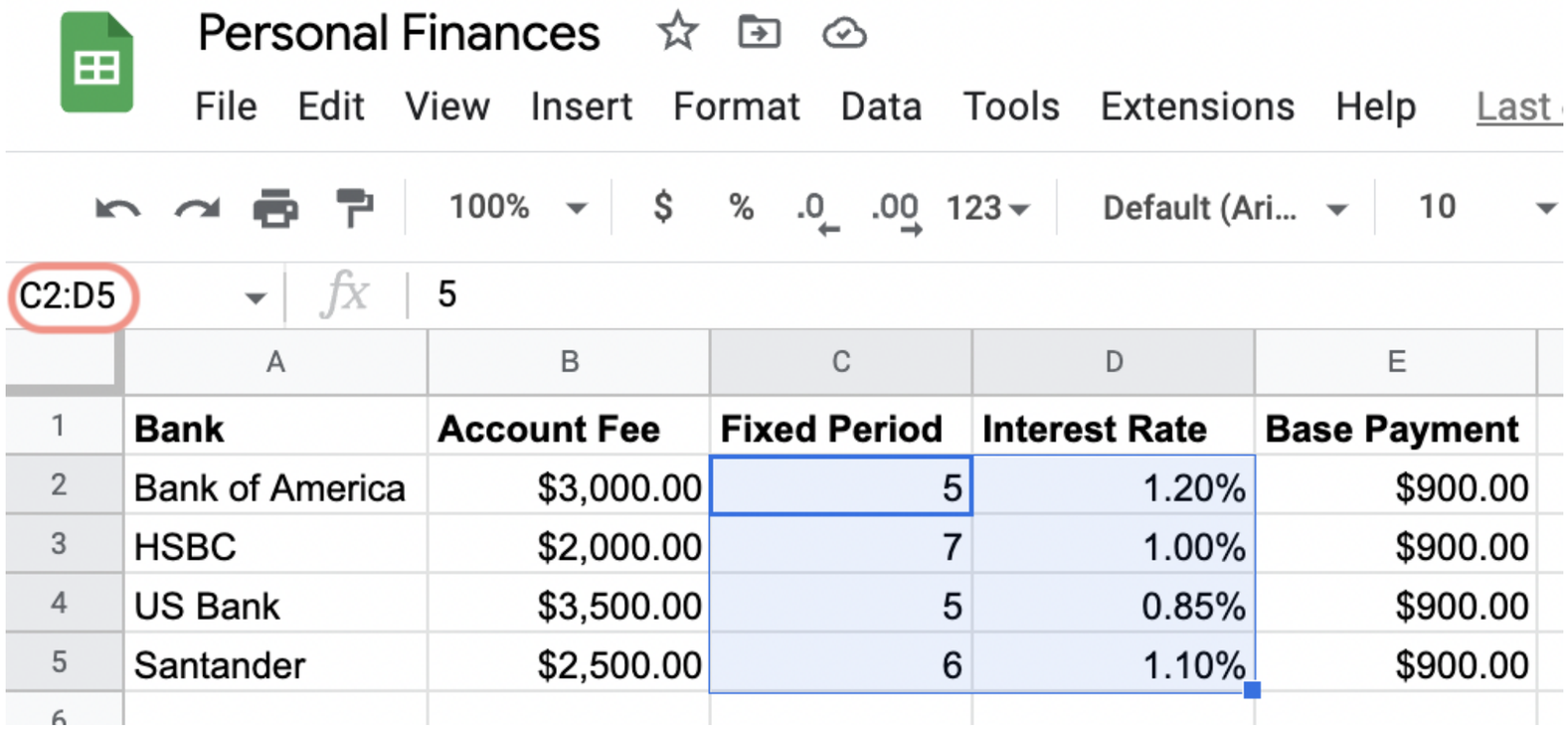

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Let's practice!

INTRODUCTION TO SPREADSHEETS

Cell mathematics!

INTRODUCTION TO SPREADSHEETS

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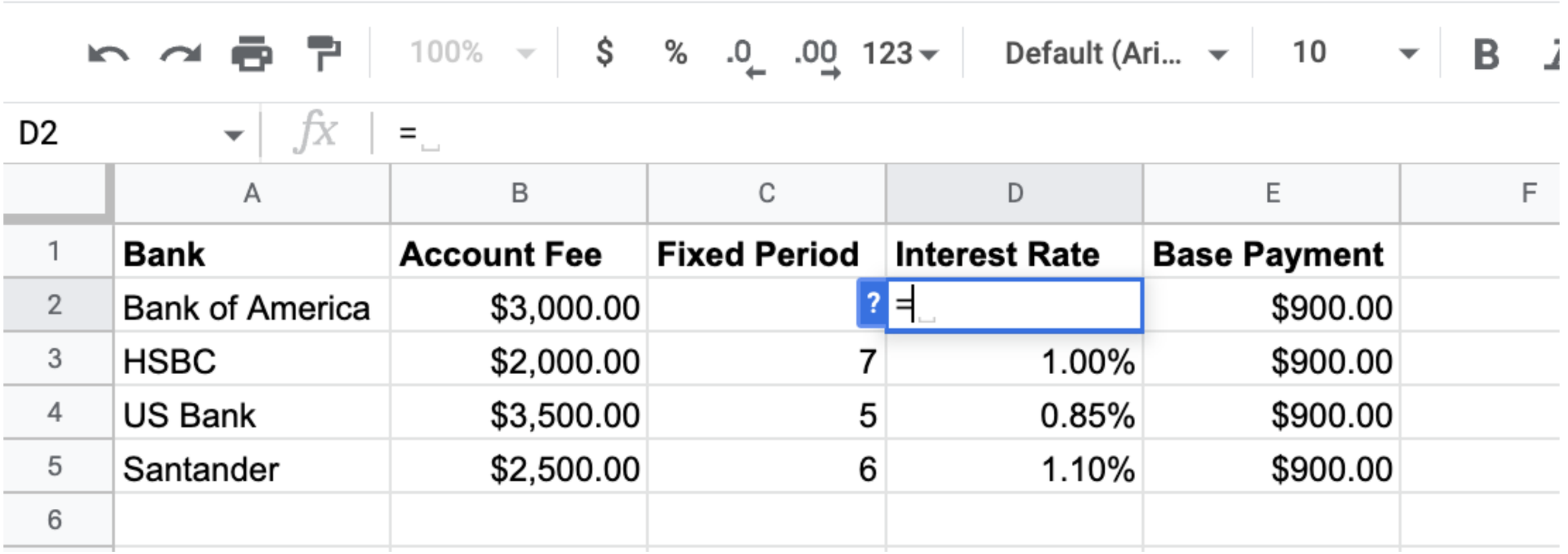
Formulas

- Calculate results from other values
- Support common arithmetic operations, including: `+`, `-`, `*`, and `/`
- Allow interested stakeholders to see how values were calculated

Writing formulas

- `=` tells the spreadsheet that we are writing a formula in the cell



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Arithmetic examples

Addition

- Formula: `= 5 + 15`
- Displayed value: `20`

Subtraction

- Formula: `= 12.5 - 7`
- Displayed value: `5.5`

Multiplication

- Formula: `= 2 * 3.2`
- Displayed value: `6.4`

Division

- Formula: `= 8 / 3`
- Displayed value: `2.666666667`
- Dividing by zero → `#DIV/0!`

More advanced arithmetic

- Exponentiation: `^` → *caret*

Formula: `= 2 ^ 3`

Displayed value: `8`

- Specify order of operations: `()`

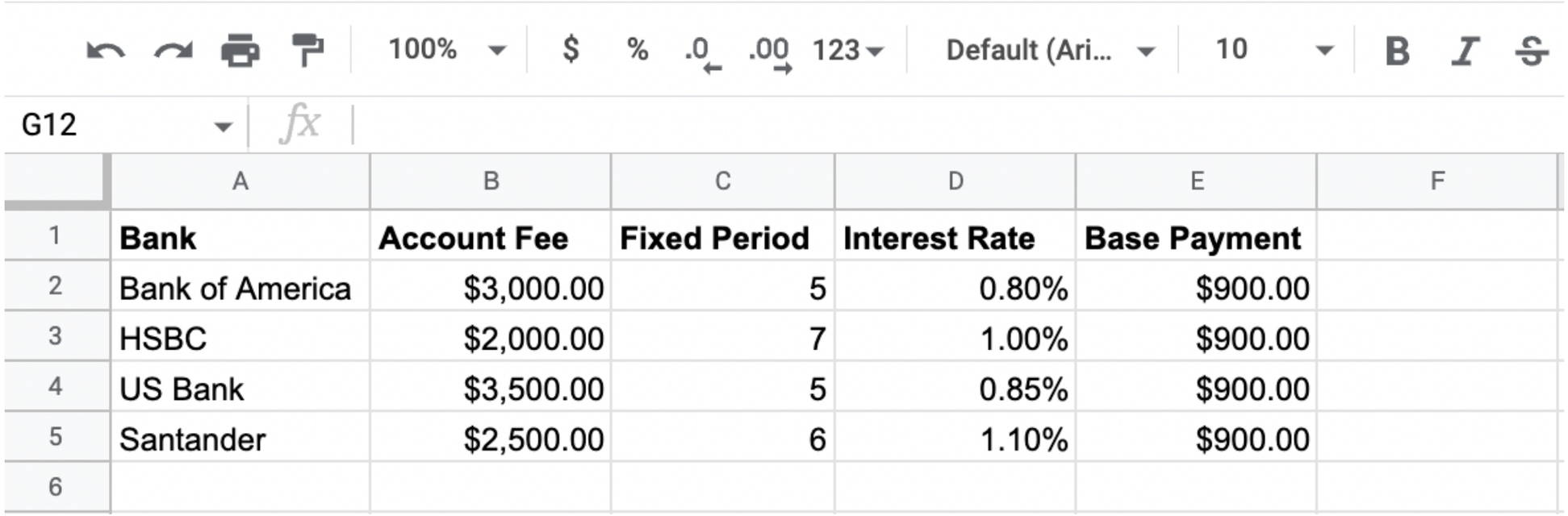
Formula: `= (2 + 3) * 6`

Displayed value: `30`

Order of operations

- Complex formula: `= (2 + 4) / 3 - 2`
  - Parentheses `()`
  - Exponents `^`
  - Multiplication `*` and division `/`
  - Addition `+` and subtraction `-`

Editing formulas



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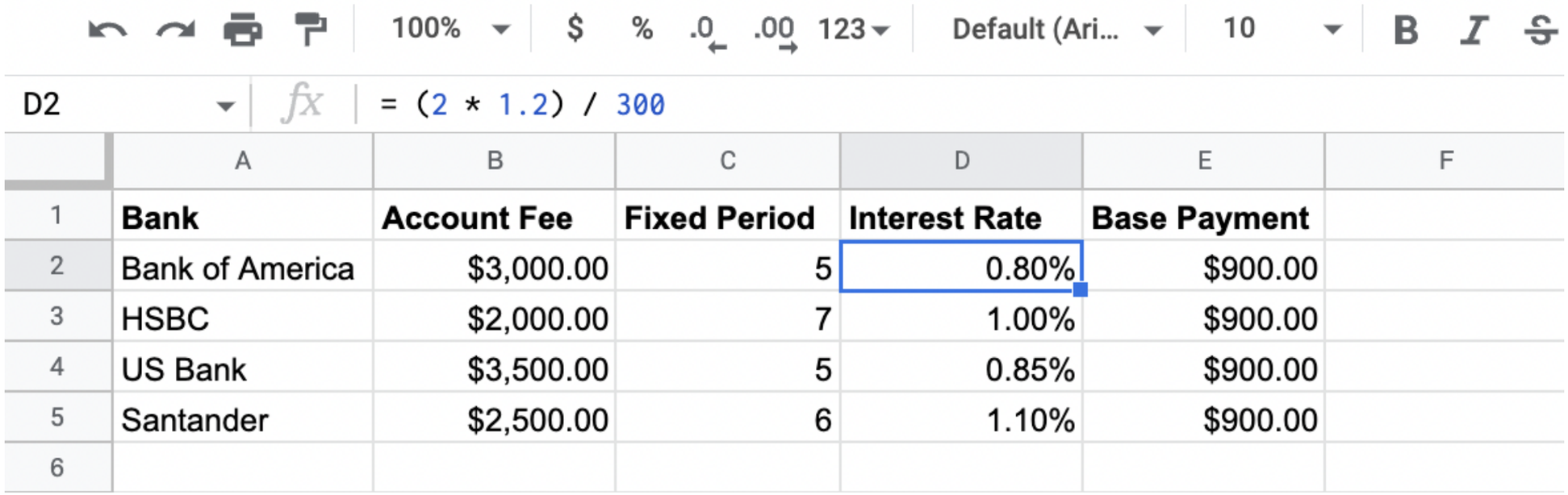

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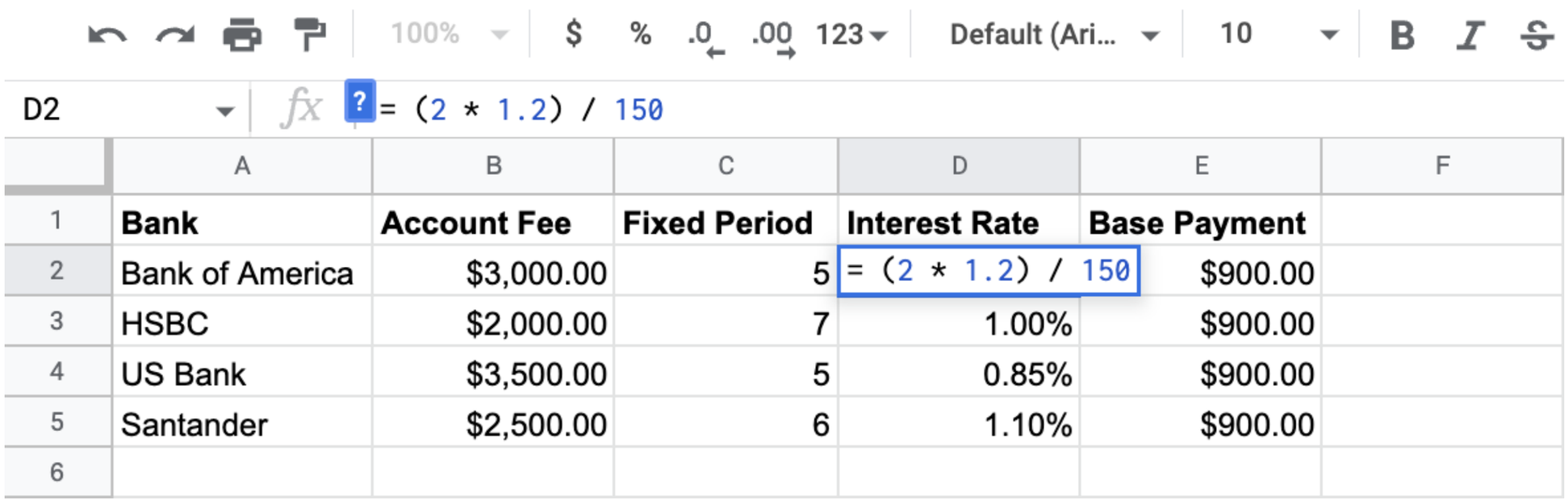

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1	**Bank**	**Account Fee**	**Fixed Period**	**Interest Rate**	**Base Payment**	
2	Bank of America	$3,000.00	5	= (2 * 1.2) / 150	$900.00	
3	HSBC	$2,000.00	7	1.00%	$900.00	
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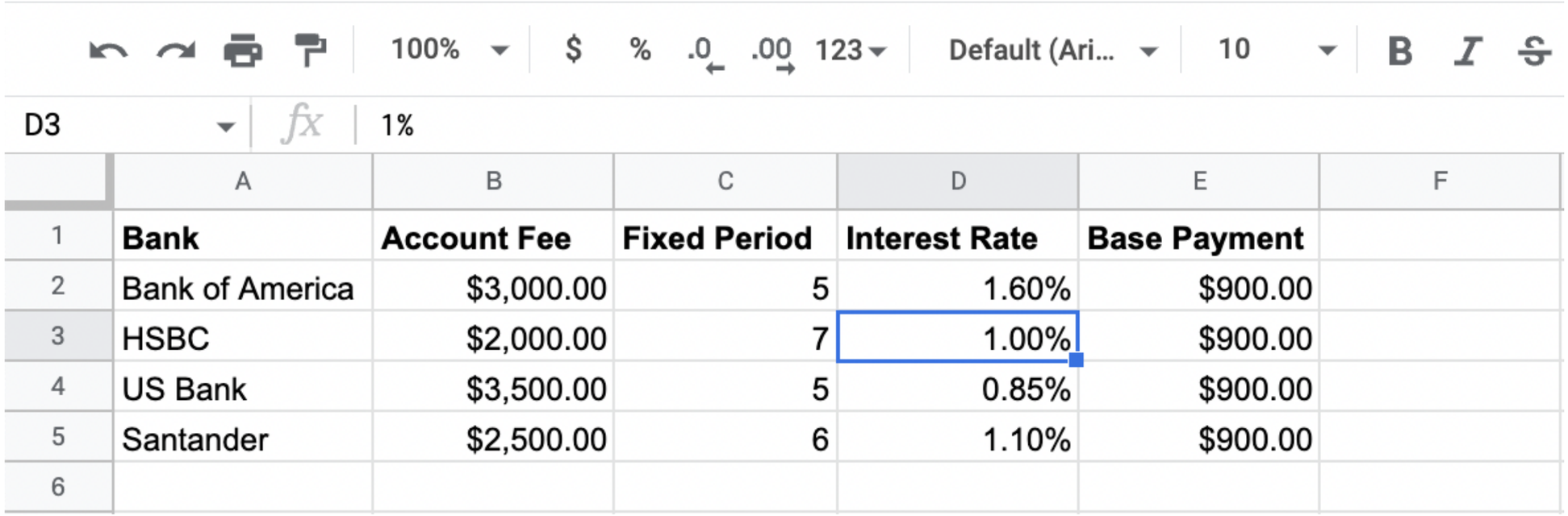

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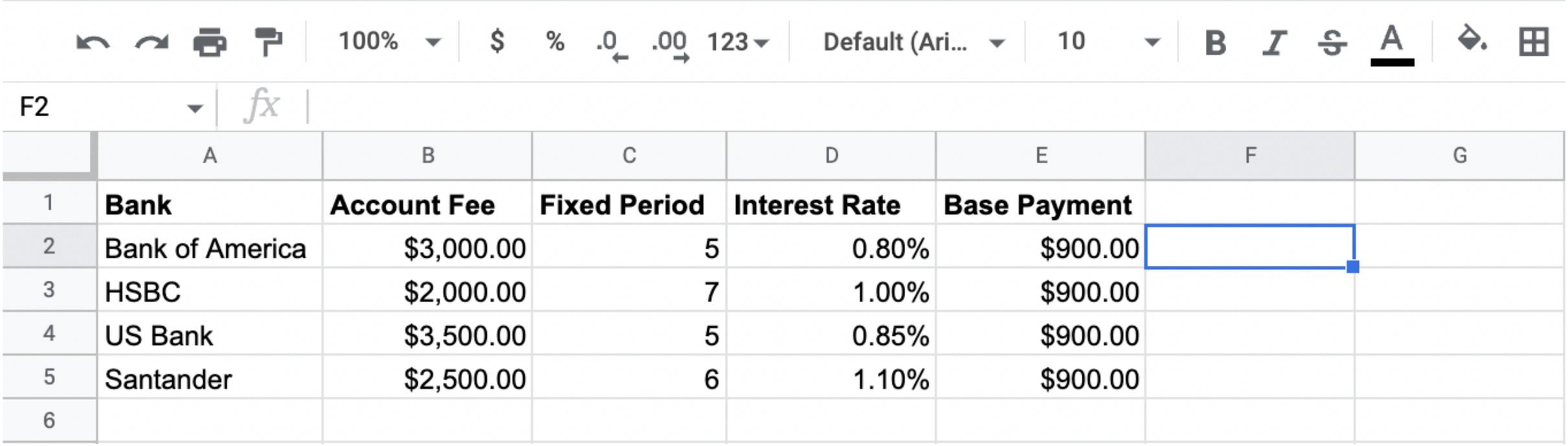
Calculating percentages



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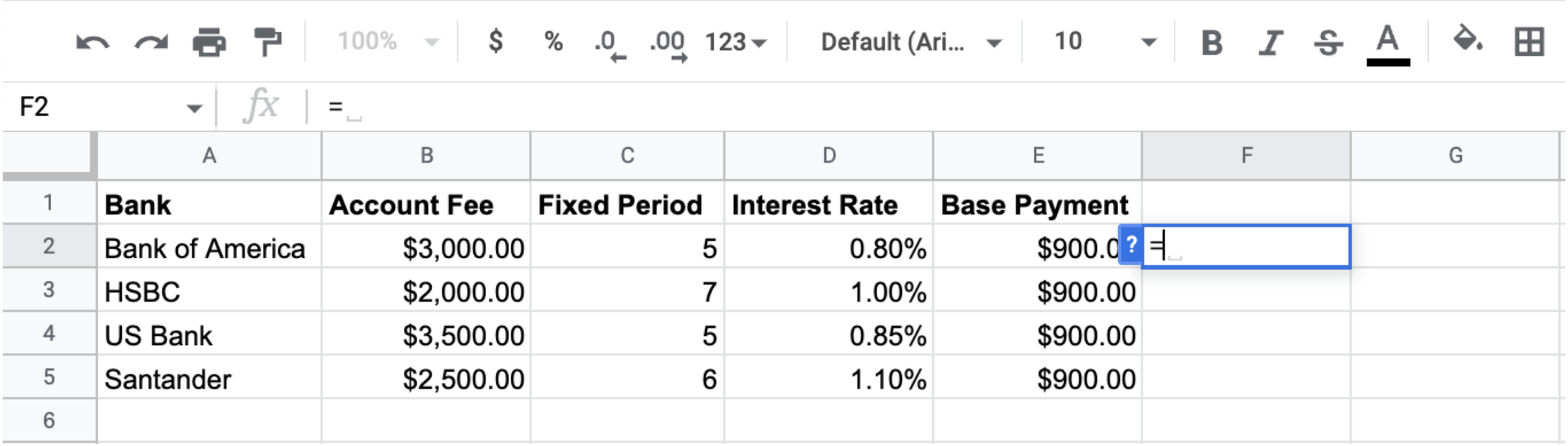

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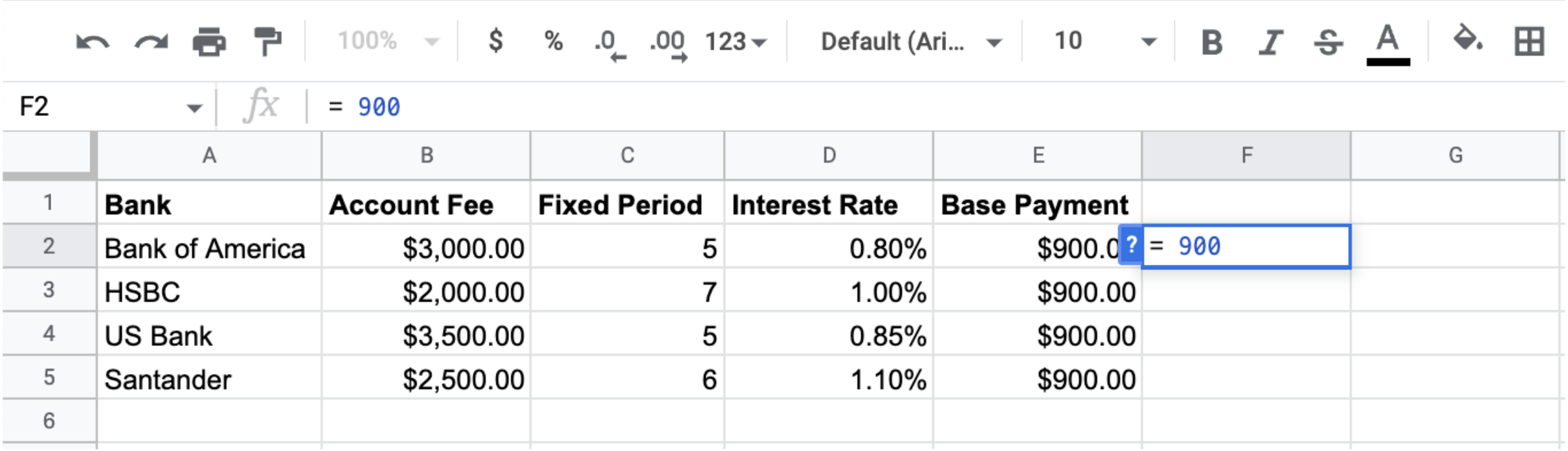

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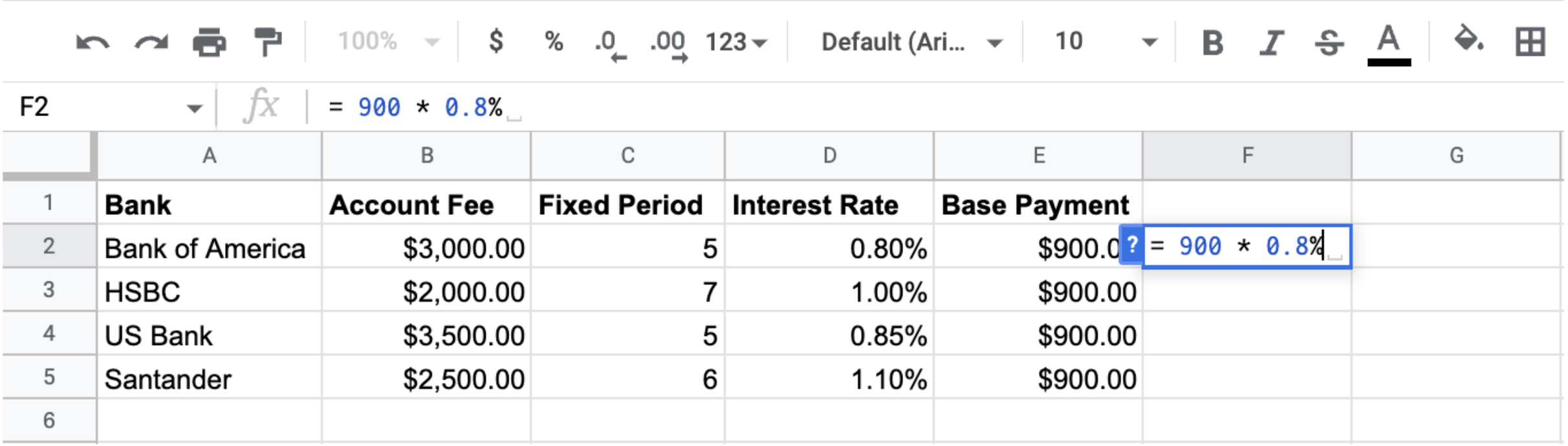

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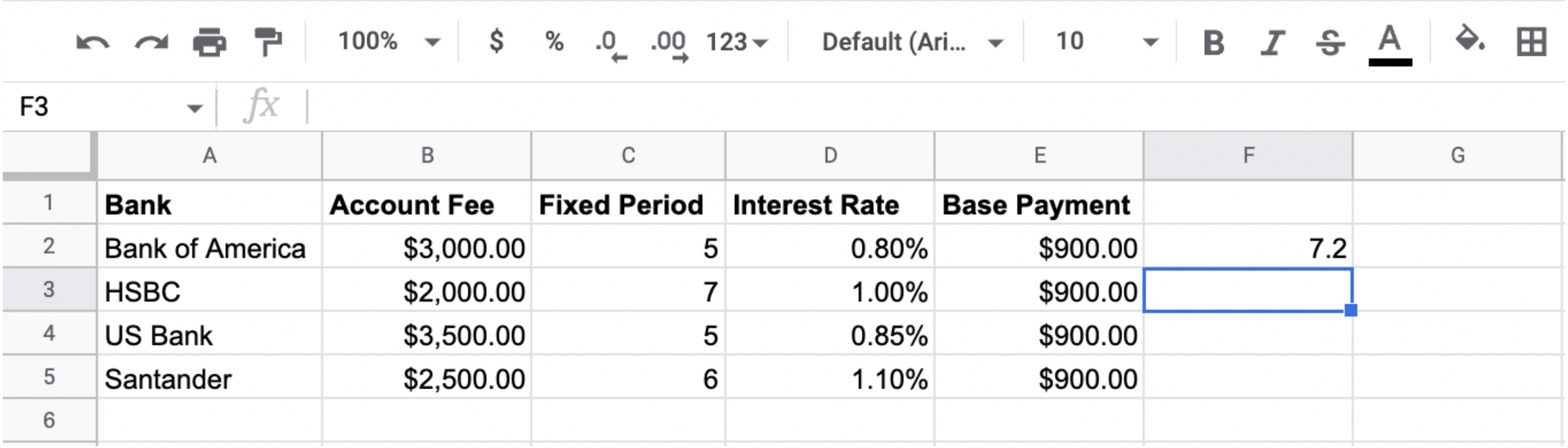

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Let's practice!

INTRODUCTION TO SPREADSHEETS

Data types and formatting

INTRODUCTION TO SPREADSHEETS

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Spreadsheet data types

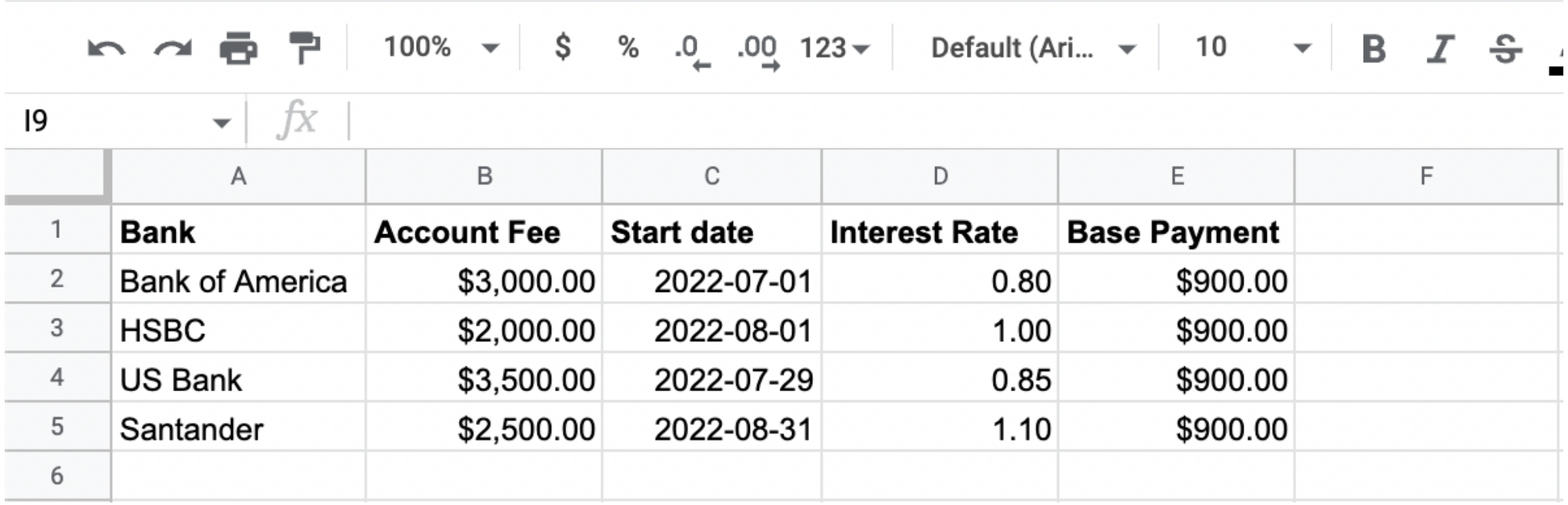
- Types of data seen so far:
  - Numbers
  - Text
  - Dates
  - Currencies
- Every cell value has a data type

Spreadsheet data types

- Cell data types are automatically detected, but can also be manually assigned
- Data type determines:
  - What operations can be performed on the cell value
  - How the value be displayed

Data type: Number

- Any number inputted into a cell → Number data type
- Allow arithmetic operations and other statistical operations
- Numerical data is *right-aligned*, by default



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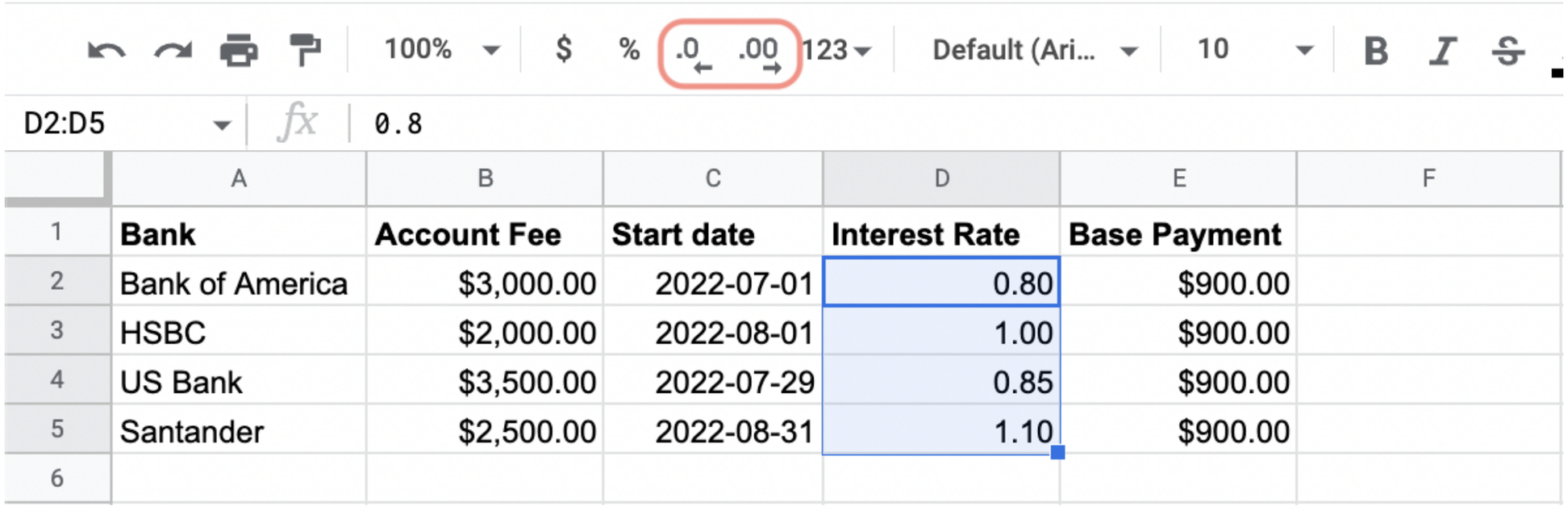
Changing decimal places



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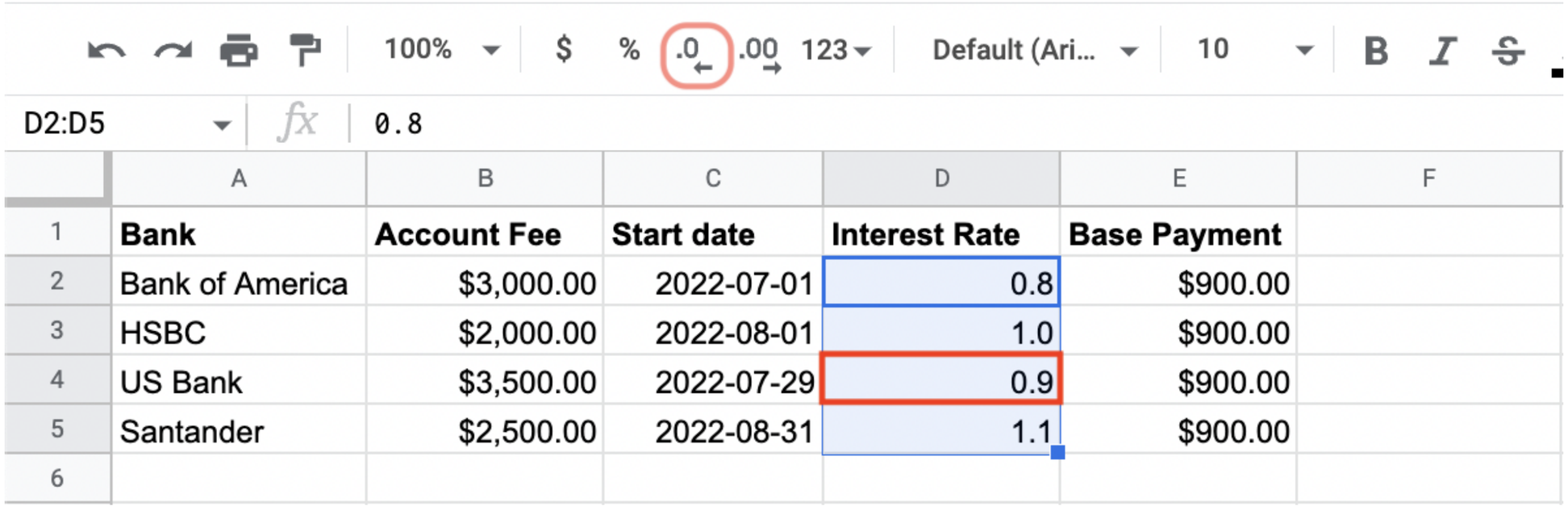
Reducing decimal places



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1	**Bank**	**Account Fee**	**Start date**	**Interest Rate**	**Base Payment**	
2	Bank of America	$3,000.00	2022-07-01	0.8	$900.00	
3	HSBC	$2,000.00	2022-08-01	1.0	$900.00	
4	US Bank	$3,500.00	2022-07-29	0.9	$900.00	
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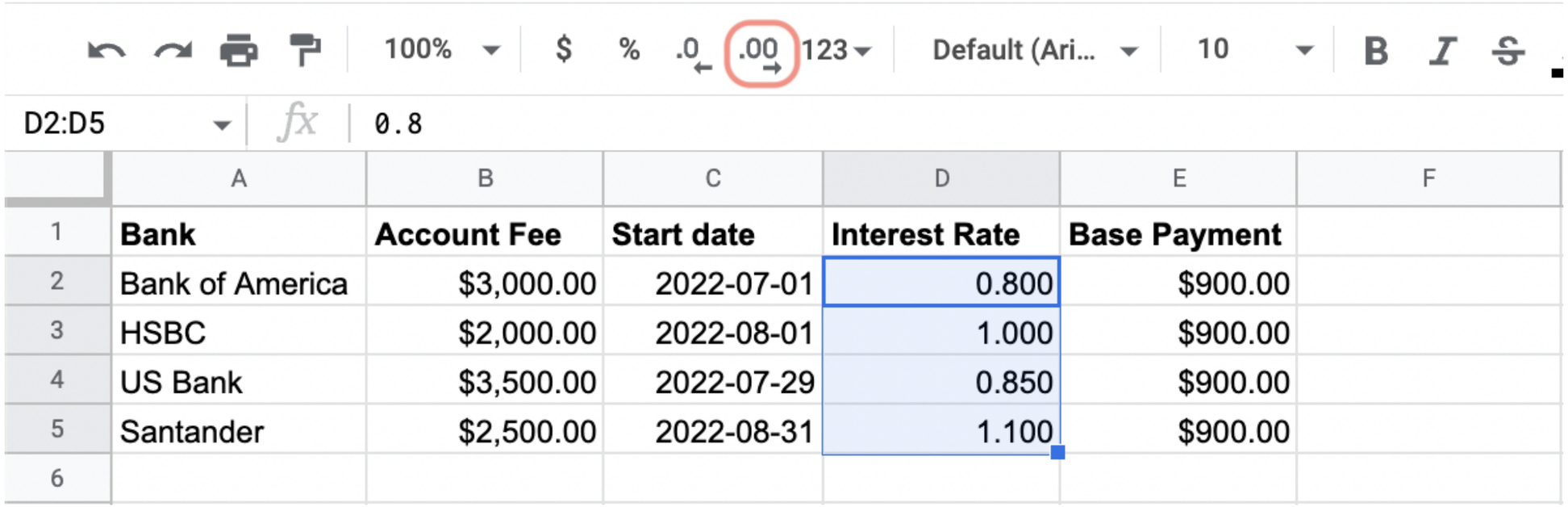
Adding decimal places



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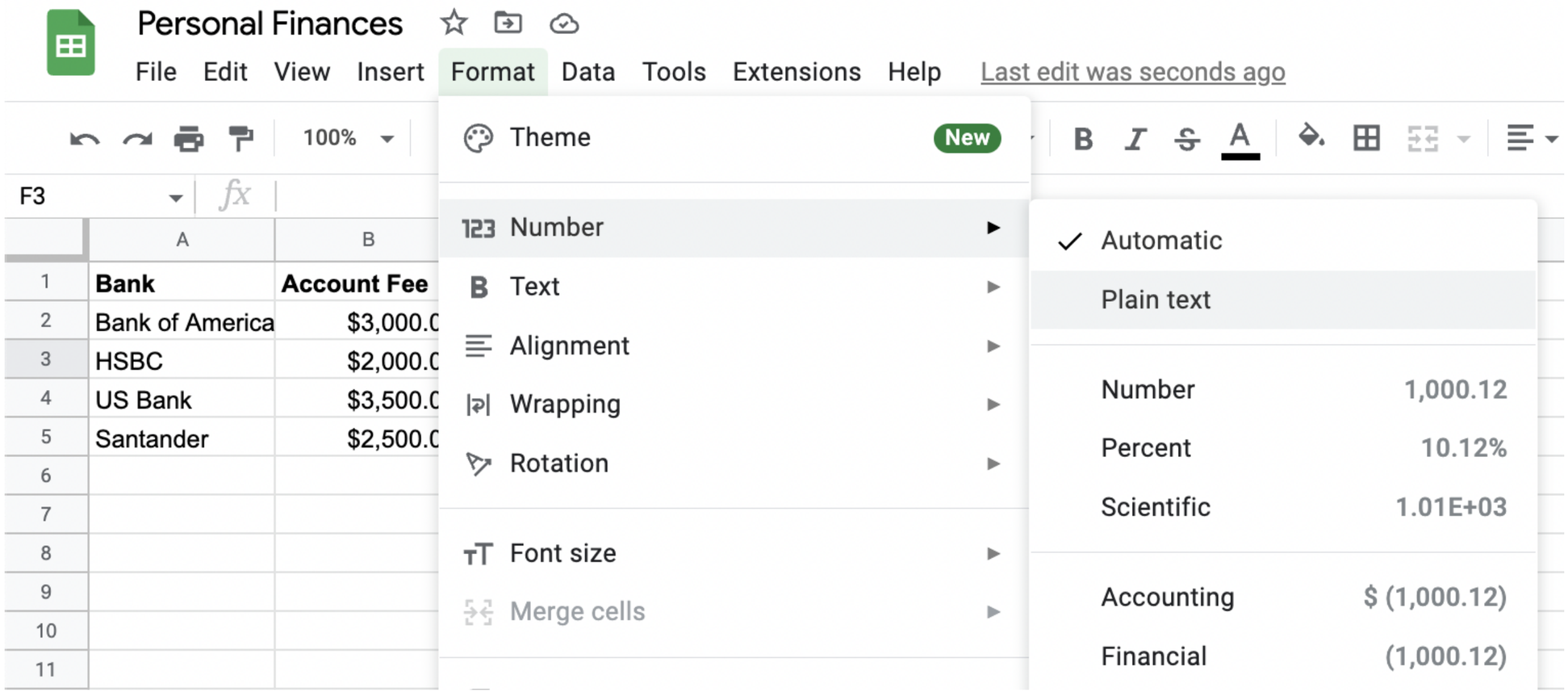
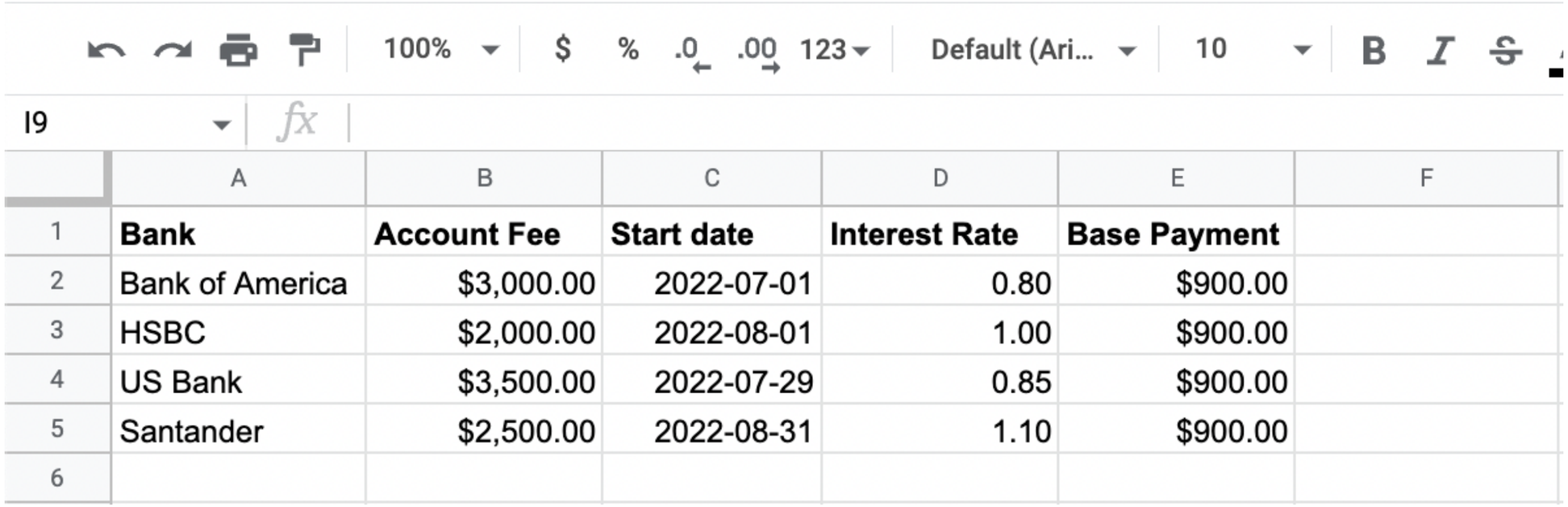
Data type: Plain text

- Assigned to cell values if no other data types are detected
- Can force a cell to Plain text using the Format > Number > Plain text



Data type: Plain text

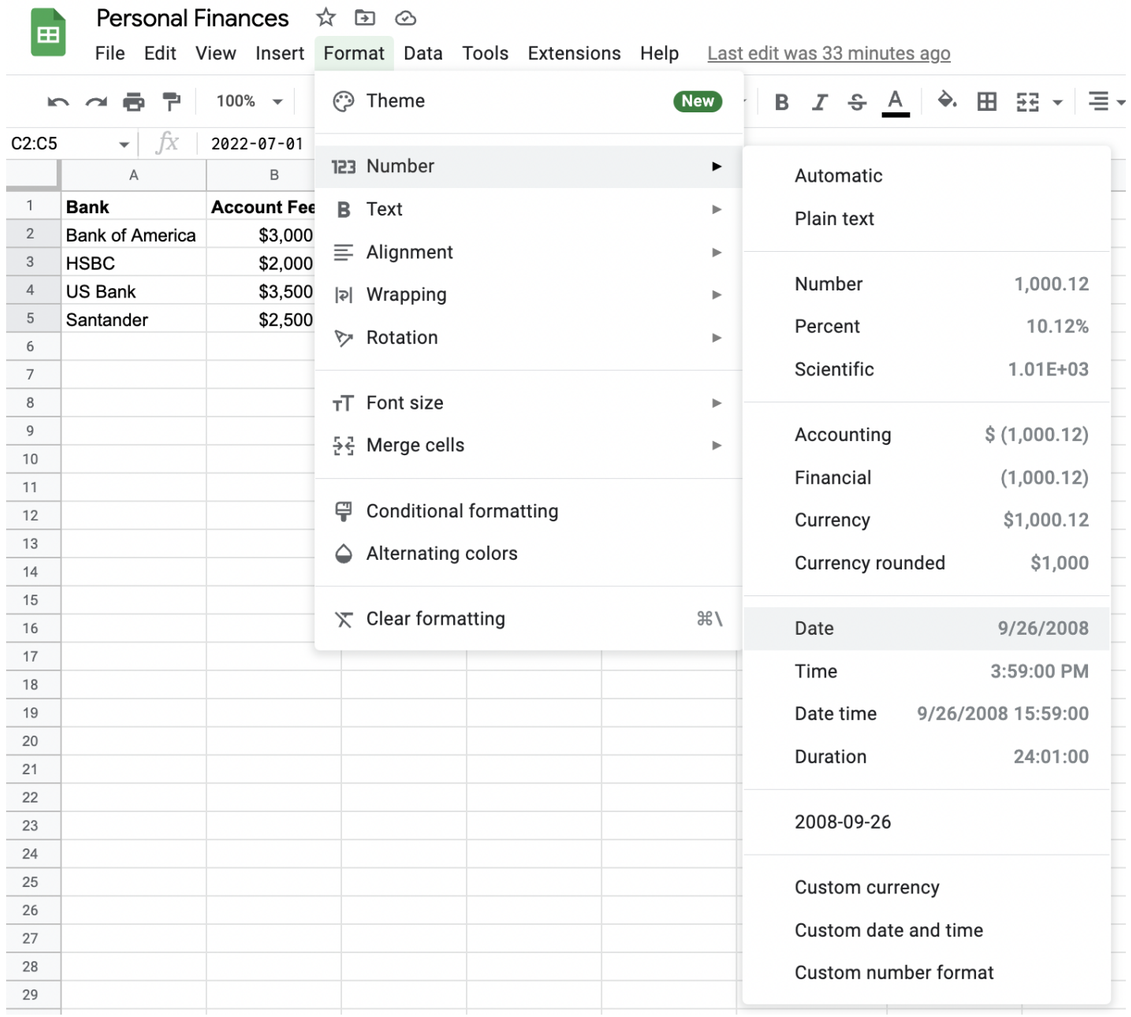
- Assigned to cell values if no other data types are detected
- Can force a cell to Plain text by prepending the contents with `'`
  - Example: `'2` and `'= 2 + 3`
- Left-aligned by default



	A	B	C	D	E	F
1	**Bank**	**Account Fee**	**Start date**	**Interest Rate**	**Base Payment**	
2	Bank of America	$3,000.00	2022-07-01	0.80	$900.00	
3	HSBC	$2,000.00	2022-08-01	1.00	$900.00	
4	US Bank	$3,500.00	2022-07-29	0.85	$900.00	
5	Santander	$2,500.00	2022-08-31	1.10	$900.00	
6						

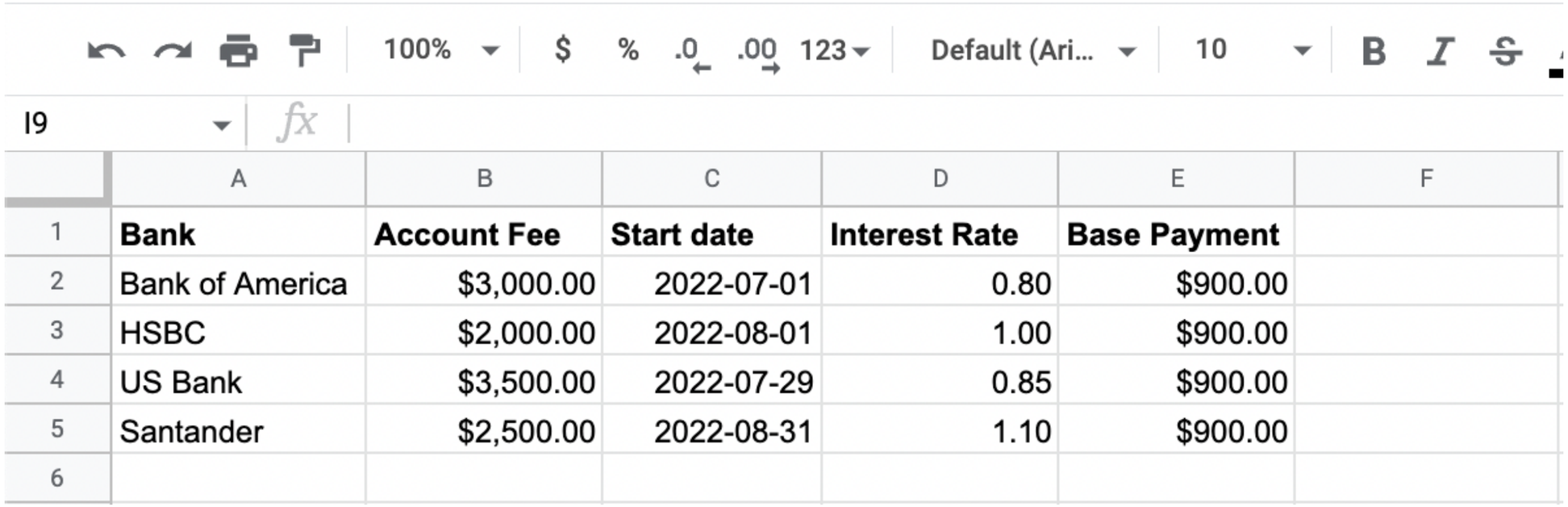
Data type: Date

- Many different date formats:
  - `2022-07-29`
  - `29/7/2022`
  - `July 29, 2022`
- Can auto-detect many date formats
- Manually specify or convert dates:
  - Format > Number
- Right-aligned by default



Data type: Currency

- Cells starting with `$` , `£` , `€` , or other currency symbol, then a number → Currency
- Right-aligned by default



	A	B	C	D	E	F
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6						

Data type: Logical

- Logical/Boolean values: `TRUE` and `FALSE`
- Logical values are case-sensitive
- Different cases will be converted, e.g., `true` → `TRUE`
- Center-aligned by default

Comparison operators

- Equal to: `=`
  - `= 1 + 2 = 3` → `TRUE`
- Not equal to: `<>`
  - `= 1 + 2 <> 3` → `FALSE`
- Greater than: `>`
  - `= 1 + 2 > 3` → `FALSE`
- Less than: `<`
  - `= 1 + 2 < 3` → `FALSE`
- Greater than or equal to: `>=`
  - `= 1 + 2 >= 3` → `TRUE`
- Less than or equal to: `<=`
  - `= 1 + 2 <= 3` → `TRUE`

Let's practice!

INTRODUCTION TO SPREADSHEETS