

# Excel VLOOKUP Function

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# When to use Excel VLOOKUP Function

- The data you are given includes a *mapping* or *function* from one set of values to another set of values.
- There is no simple mathematical formula for computing the *mapping*

# Example:

- You are given information that maps numeric scores to letter grades
- You are asked to find a letter grade for students based upon their numeric scores.

# Given Table:

<b>Letter Grade</b>	<b>Numeric Score</b>
A	At least 95 up to and including 100
A-	At least 90 but less than 95
B+	At least 86.7 but less than 90
B	At least 83.3 but less than 86.7
B-	At least 80 but less than 83.3
C+	At least 76.7 but less than 80
C	At least 73.3 but less than 76.7
C-	At least 70 but less than 73.3
D+	At least 67.7 but less than 70
D	At least 63.3 but less than 67.7
D-	At least 60 but less than 63.3
F	Less than 60

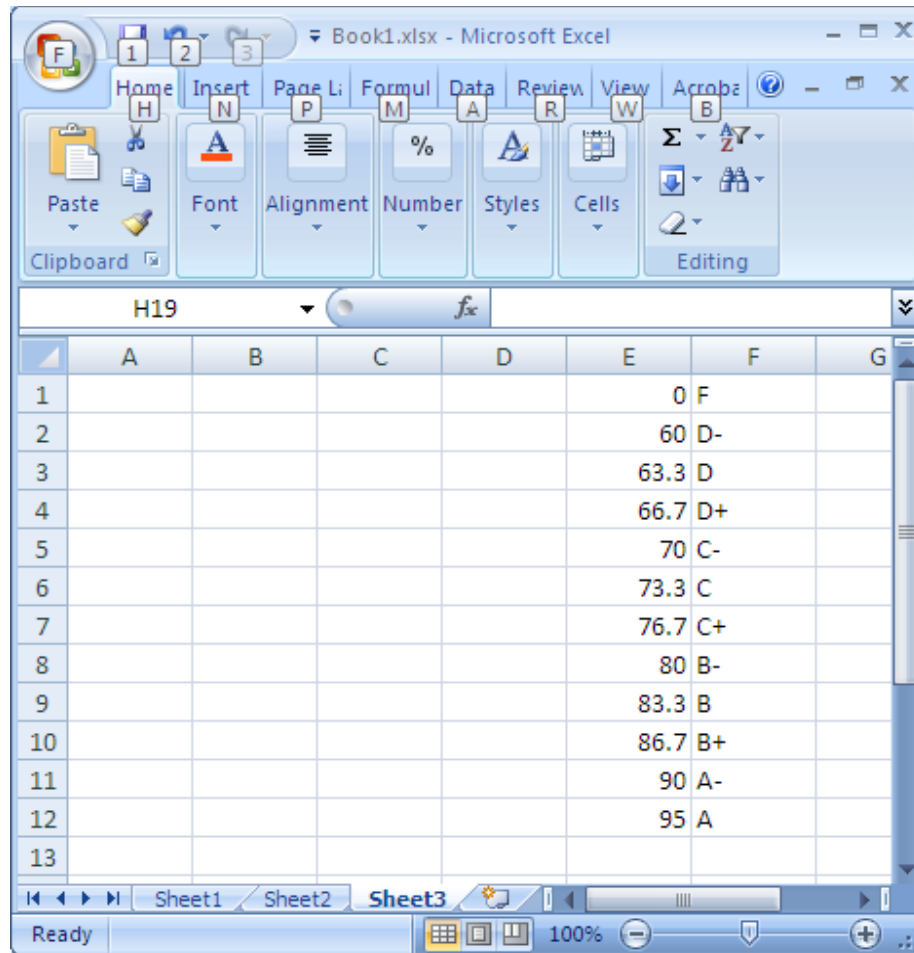
# Independent and Dependent Variables

- The *independent* variable is the variable whose value you know *before* you look-up.
- The *dependent* variable is the variable whose value you do not know until *after* a look-up.
- In the example given, the numeric score is the independent variable, and the letter grade is the dependent variable.

# How to set up a VLOOKUP table in Excel

- You must place the **independent** variable in a column **before** the **dependent** variable
- You must place the independent variable in **ascending order**.
- The independent variable column lists only the **lower bound** of each range, not the whole range.

# VLOOKUP Table Setup



# Using VLOOKUP Table

- To use a VLOOKUP Table in Excel, use the Excel VLOOKUP function.
- This function (typically) takes 3 arguments.
  1. The first argument is the value of the **independent** variable.
  2. The second argument is the range of cells that constitutes the `vlookup` table. The first column must be for the **independent** variable.
  3. The third argument is the column within the `vlookup` table in which the **dependent** variable is found.

# Example:

The screenshot displays the Microsoft Excel interface with the following data and formula:

	A	B	C	D	E	F	G
1	Tom	82.5	B-		0	F	
2	Sally	93.7	A-		60	D-	
3	Bill	88.4	B+		63.3	D	
4					66.7	D+	
5					70	C-	
6					73.3	C	
7					76.7	C+	
8					80	B-	
9					83.3	B	
10					86.7	B+	
11					90	A-	
12					95	A	
13							

Formula Bar: C1    =VLOOKUP(B1,\$E\$1:\$F\$12,2)

# Optional 4<sup>th</sup> Argument

- The example of `vlookup` that we have seen, uses what is called *range* lookup.
- If an optional 4<sup>th</sup> argument is added with the value `false`, then *exact match* lookup is used.
- When *exact match* lookup is used, the first variable in the `vlookup` function must match a value in the *independent* variable column of the `vlookup` table exactly, or the result is an error.