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Week 1:

1. **What is difference and similarity between .csv and .txt?**

.csv stores structured data. You can say stores data in tabular form. There are rows and columns and each values/entry is separated by a delimiter (commonly a comma, though other delimiters like tabs or semicolons can also be used). Each value represents a column.

.txt stores both structured (if organized manually (e.g., tab-delimited or space-separated data) and unstructured data.

2. **What is the difference between using header=True ?**

df = read.table("spider.txt",header= T) #load the file to read

Here without header, we see column names as V1,V2,V3...

3. **How to use log and log rules?**

```
> log(10)
[1] 2.302585 #compute natural logarithm
> log(2*8)
[1] 2.772589
> log(16)
[1] 2.772589
> log(2*8)/2
[1] 1.386294
> log(16)/2
[1] 1.386294
> (log(2)*log(8))/2
[1] 0.7206795
> (log(2)+log(8))/2
[1] 1.386294
```

4. **What is similarities and difference between NA and NAN?**

all NaN (not a number) are NA (Not Available) but all NA is not NaN.

NaN: Only appears in numeric contexts, representing an invalid mathematical operation (e.g., 0/0, log of a negative number, etc.). It is a special type of NA.

NA: Can represent missing data of any type (numeric, logical, character, etc.), and is not necessarily tied to invalid mathematical operations.

Differences:

Aspect	`NA` (Not Available)	`NaN` (Not a Number)
Meaning	Represents a general missing or unavailable value, which could be numeric, character, etc.	Represents an undefined mathematical result, such as 0/0 or ∞ - ∞.
Context	Used to represent any type of missing value (e.g., numeric, character, logical).	Specifically used to represent undefined numeric results.
Type-Specific	Can appear in different data types like logical (`NA`), integer (`NA_integer_`), or character (`NA_character_`).	Limited to numerical values.
Detection	Detected using `is.na()` .	Detected using both `is.na()` and `is.nan()` because `NaN` is a special case of `NA` .
Mathematical Operations	Usually propagates as `NA` .	Appears in specific cases, like 0/0 or log of a negative number.
Example	`NA + 1` results in `NA` .	`0 / 0` results in `NaN` .

The end for Week 1.