



**Most Visited Web Sites.** In a recent report, the top five most-visited English-language web sites were google.com (GOOG), facebook.com (FB), youtube.com (YT), yahoo.com (YAH), and wikipedia.com (WIKI). The most-visited web sites for a sample of 50 Internet users are shown in the following table. **LO 1, 3**

|      |      |      |      |      |
|------|------|------|------|------|
| YAH  | WIKI | YT   | WIKI | GOOG |
| YT   | YAH  | GOOG | GOOG | GOOG |
| WIKI | GOOG | YAH  | YAH  | YAH  |
| YAH  | YT   | GOOG | YT   | YAH  |
| GOOG | FB   | FB   | WIKI | GOOG |
| GOOG | GOOG | FB   | FB   | WIKI |
| FB   | YAH  | YT   | YAH  | YAH  |
| YT   | GOOG | YAH  | FB   | FB   |
| WIKI | GOOG | YAH  | WIKI | WIKI |
| YAH  | YT   | GOOG | GOOG | WIKI |

a. Are these data categorical or quantitative?  
 B. Provide frequency and percent frequency distributions.

| Web Site | Frequency | %Frequency |
|----------|-----------|------------|
| FB       | 2         | 4          |
| GOOG     | 4         | 8          |
| WIKI     | 5         | 10         |
| YAH      | 5         | 10         |
| YT       | 10        | 20         |

## Analysis

Here's the analysis of the provided data:

### a. Are these data categorical or quantitative?!

The data are **categorical**. They represent categories of websites (GOOG, FB, YT, YAH, WIKI) rather than numerical measurements.

### B. Provide frequency and percent frequency distributions.

Let's count the occurrences of each website:

- **FB:**
  - Row 3: FB
  - Row 4: FB, FB
  - Row 5: FB, FB, FB
  - Row 6: FB, FB
  - Total:  $2 + 3 + 2 = 7$  (Wait, let me double check this, looks like I made a mistake, let me re-count everything from scratch)

Let me recount by going row by row and marking the counts.

Row 1: YAH, WIKI, YT, WIKI, GOOG

Row 2: YT, YAH, GOOG, GOOG, GOOG

Row 3: WIKI, GOOG, YAH, YAH, YAH

Row 4: YAH, YT, GOOG, YT, YAH

Row 5: GOOG, FB, FB, WIKI, GOOG

Row 6: GOOG, GOOG, FB, FB, WIKI

Row 7: FB, YAH, YT, YAH, YAH

Row 8: YT, GOOG, YAH, FB, FB

Row 9: WIKI, GOOG, YAH, WIKI, WIKI

Row 10: YAH, YT, GOOG, GOOG, WIKI

Counts:

- **FB:**  $2 \text{ (Row 5)} + 2 \text{ (Row 6)} + 1 \text{ (Row 7)} + 2 \text{ (Row 8)} = 7$
- **GOOG:**  $1 \text{ (Row 1)} + 3 \text{ (Row 2)} + 1 \text{ (Row 3)} + 1 \text{ (Row 4)} + 2 \text{ (Row 5)} + 2 \text{ (Row 6)} + 2 \text{ (Row 9)} + 2 \text{ (Row 10)} = 14$
- **WIKI:**  $2 \text{ (Row 1)} + 1 \text{ (Row 3)} + 1 \text{ (Row 5)} + 1 \text{ (Row 6)} + 3 \text{ (Row 9)} + 1 \text{ (Row 10)} = 9$
- **YAH:**  $1 \text{ (Row 1)} + 1 \text{ (Row 2)} + 3 \text{ (Row 3)} + 2 \text{ (Row 4)} + 2 \text{ (Row 7)} + 1 \text{ (Row 8)} + 1 \text{ (Row 9)} + 1 \text{ (Row 10)} = 12$
- **YT:**  $1 \text{ (Row 1)} + 1 \text{ (Row 2)} + 2 \text{ (Row 4)} + 1 \text{ (Row 7)} + 1 \text{ (Row 8)} + 1 \text{ (Row 10)} = 7$

Total observations: 50 (as stated in the problem: "a sample of 50 Internet users")

Let's sum my counts:  $7 + 14 + 9 + 12 + 7 = 49$ . This is 1 less than 50. Let me re-count carefully.

Re-counting more systematically by creating a tally:

- **FB:**
  - Row 5: FB, FB (2)
  - Row 6: FB, FB (2)
  - Row 7: FB (1)
  - Row 8: FB, FB (2)
  - Total FB:  $2 + 2 + 1 + 2 = 7$
- **GOOG:**
  - Row 1: GOOG (1)
  - Row 2: GOOG, GOOG, GOOG (3)
  - Row 3: GOOG (1)
  - Row 4: GOOG (1)
  - Row 5: GOOG (1)
  - Row 6: GOOG, GOOG (2)
  - Row 9: GOOG (1)
  - Row 10: GOOG, GOOG (2)
  - Total GOOG:  $1 + 3 + 1 + 1 + 1 + 2 + 1 + 2 = 12$  (Ah, I made an error here, in the previous

- Total GOOG:  $1 + 3 + 1 + 1 + 1 + 2 + 1 + 2 = 12$  (Ah, I made an error here, in the previous count, I got 14, now it is 12)

- WIKI:

- Row 1: WIKI, WIKI (2)
- Row 3: WIKI (1)
- Row 5: WIKI (1)
- Row 6: WIKI (1)
- Row 9: WIKI, WIKI, WIKI (3)
- Row 10: WIKI (1)
- Total WIKI:  $2 + 1 + 1 + 1 + 3 + 1 = 9$

- YAH:

- Row 1: YAH (1)
- Row 2: YAH (1)
- Row 3: YAH, YAH, YAH (3)
- Row 4: YAH, YAH (2)
- Row 7: YAH, YAH, YAH (3)
- Row 8: YAH (1)
- Row 9: YAH (1)
- Row 10: YAH (1)
- Total YAH:  $1 + 1 + 3 + 2 + 3 + 1 + 1 + 1 = 13$  (Previous count was 12, now it is 13)

- YT:

- Row 1: YT (1)
- Row 2: YT (1)
- Row 4: YT, YT (2)
- Row 7: YT (1)
- Row 8: YT (1)
- Row 10: YT (1)
- Total YT:  $1 + 1 + 2 + 1 + 1 + 1 = 7$

Let's sum the new counts:  $7 \text{ (FB)} + 12 \text{ (GOOG)} + 9 \text{ (WIKI)} + 13 \text{ (YAH)} + 7 \text{ (YT)} = 48$ . Still not 50. Let me check the image for any missed items.

Okay, I will re-do the tally very carefully, going cell by cell

Okay, I will re-do the tally very carefully, going cell by cell.

| Cell (Row, Col) | Value | Tally |

| ---|---|---|

| (1,1) | YAH | YAH: 1 |

| (1,2) | WIKI | WIKI: 1 |

| (1,3) | YT | YT: 1 |

| (1,4) | WIKI | WIKI: 2 |

| (1,5) | GOOG | GOOG: 1 |

| (2,1) | YT | YT: 2 |

| (2,2) | YAH | YAH: 2 |

| (2,3) | GOOG | GOOG: 2 |

| (2,4) | GOOG | GOOG: 3 |

| (2,5) | GOOG | GOOG: 4 |

| (3,1) | WIKI | WIKI: 3 |

| (3,2) | GOOG | GOOG: 5 |

| (3,3) | YAH | YAH: 3 |

| (3,4) | YAH | YAH: 4 |

| (3,5) | YAH | YAH: 5 |

| (4,1) | YAH | YAH: 6 |

| (4,2) | YT | YT: 3 |

| (4,3) | GOOG | GOOG: 6 |

| (4,4) | YT | YT: 4 |

| (4,5) | YAH | YAH: 7 |

| (5,1) | GOOG | GOOG: 7 |

| (5,2) | FB | FB: 1 |

| (5,3) | FB | FB: 2 |

| (5,4) | WIKI | WIKI: 4 |

| (5,5) | GOOG | GOOG: 8 |

| (6,1) | GOOG | GOOG: 9 |

| (6,2) | GOOG | GOOG: 10 |

| (6,3) | FB | FB: 3 |

| (6,4) | FB | FB: 4 |

| (6,5) | WIKI | WIKI: 5 |

| (7,1) | FB | FB: 5 |

| (7,2) | YAH | YAH: 8 |

| (7,3) | YT | YT: 5 |

| (7,4) | YAH | YAH: 9 |

| (7,5) | YAH | YAH: 10 |

| (8,1) | YT | YT: 6 |

| (8,2) | GOOG | GOOG: 11 |  
 | (8,3) | YAH | YAH: 11 |  
 | (8,4) | FB | FB: 6 |  
 | (8,5) | FB | FB: 7 |  
 | (9,1) | WIKI | WIKI: 6 |  
 | (9,2) | GOOG | GOOG: 12 |  
 | (9,3) | YAH | YAH: 12 |  
 | (9,4) | WIKI | WIKI: 7 |  
 | (9,5) | WIKI | WIKI: 8 |  
 | (10,1) | YAH | YAH: 13 |  
 | (10,2) | YT | YT: 7 |  
 | (10,3) | GOOG | GOOG: 13 |  
 | (10,4) | GOOG | GOOG: 14 |  
 | (10,5) | WIKI | WIKI: 9 |

Final Counts:

- FB: 7
- GOOG: 14
- WIKI: 9
- YAH: 13
- YT: 7

Total:  $7 + 14 + 9 + 13 + 7 = 50$ . This matches the sample size! Excellent.

Now, let's complete the frequency and percent frequency distributions.

| Web site | Frequency | % Frequency            |
|----------|-----------|------------------------|
| FB       | 7         | $(7/50) * 100 = 14\%$  |
| GOOG     | 14        | $(14/50) * 100 = 28\%$ |
| WIKI     | 9         | $(9/50) * 100 = 18\%$  |
| YAH      | 13        | $(13/50) * 100 = 26\%$ |
| YT       | 7         | $(7/50) * 100 = 14\%$  |
| Total    | 50        | 100%                   |

Here's the table filled in according to the image's format:

**Frequency and Percent Frequency Distributions**

## Frequency and Percent Frequency Distributions

| Web site | Frequency | % Frequency |
|----------|-----------|-------------|
| FB       | 7         | 14          |
| GOOG     | 14        | 28          |
| WIKI     | 9         | 18          |
| YAH      | 13        | 26          |
| YT       | 7         | 14          |

Computing Mean and Median. Consider a sample with data values of 10, 20, 12, 17, and 16. LO 8...

Show code <>

✦ Show thinking ▼

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The results for computing the mean and median for the given samples are as follows:

a. Compute the mean and median.

- For the sample data values: 10, 20, 12, 17, 16
  - Mean: 15.0
  - Median: 16.0

b. Consider a sample with data values 10, 20, 12, 17, 16, and 12. How would you expect the mean and median for these sample data to compare to the mean and median for part a (higher, lower, or the same)? Compute the mean and median for the sample data 10, 20, 12, 17, 16, and 12.

- Expectation:
  - Mean:** I would expect the mean to be **lower**. The new data point (12) is lower than the previous mean (15.0), and adding a value lower than the current mean generally pulls the mean down.
  - Median:** I would expect the median to be **lower**. The original sorted data for part a is

10, 12, 16, 17, 20, with the median being 16. The new data set, when sorted, will be 10, 12, 12, 16, 17, 20. Since there's an even number of data points, the median will be the average of the two middle values, which will likely be lower than the previous median.

- For the sample data values: 10, 20, 12, 17, 16, 12
  - New Mean: 14.5
  - New Median: 14.0

Question 1 (10 points)

Relative Frequency Distribution: A partial relative frequency distribution is given. (10)

| Class | Relative Frequency |
|-------|--------------------|
| A     | 0.22               |
| B     | 0.18               |
| C     | 0.40               |
| D     |                    |

What is the relative frequency of the class D? 1. \_\_\_\_\_

The total sample size is 200. What is the frequency of class D? 2. \_\_\_\_\_

Show the frequency distribution.

Show the percent frequency distribution.

| Class | Relative Frequency | Frequency | % Frequency |
|-------|--------------------|-----------|-------------|
| A     | 0.22               | 44        | 22          |
| B     | 0.18               | 36        | 18          |
| C     | 0.40               | 80        | 40          |
| D     |                    |           |             |
| Total | 1.00               | 200       | 100         |

## Analysis

Here's the breakdown of the relative frequency distribution problem:

Given Partial Relative Frequency Distribution:

| Class | Relative Frequency |
|-------|--------------------|
| A     | 0.22               |
| B     | 0.18               |
| C     | 0.40               |
| D     | ?                  |

1. What is the relative frequency of the class D?

The sum of all relative frequencies in a distribution must equal 1.

So, Relative Frequency (D) = 1 - (Relative Frequency (A) + Relative Frequency (B) + Relative Frequency (C))

Relative Frequency (D) = 1 - (0.22 + 0.18 + 0.40)

Relative Frequency (D) = 1 - 0.80



Relative Frequency (D) = 0.20

2. The total sample size is 200. What is the frequency of class D?

Frequency = Relative Frequency × Total Sample Size

Frequency (D) = 0.20 × 200

Frequency (D) = 40

Show the frequency distribution.

To show the frequency distribution, we first need to calculate the frequencies for classes A, B, and C as well.

- Frequency (A) = Relative Frequency (A) × Total Sample Size = 0.22 × 200 = 44
- Frequency (B) = Relative Frequency (B) × Total Sample Size = 0.18 × 200 = 36
- Frequency (C) = Relative Frequency (C) × Total Sample Size = 0.40 × 200 = 80
- Frequency (D) = 40 (calculated above)

Let's verify the total frequency: 44 + 36 + 80 + 40 = 200. This matches the total sample size.

Show the percent frequency distribution.

Percent Frequency = Relative Frequency × 100%

- % Frequency (A) = 0.22 × 100% = 22%
- % Frequency (B) = 0.18 × 100% = 18%
- % Frequency (C) = 0.40 × 100% = 40%
- % Frequency (D) = 0.20 × 100% = 20%

Let's verify the total percent frequency: 22% + 18% + 40% + 20% = 100%.

Completed Table:

| Class | Relative Frequency | Frequency | % Frequency |
|-------|--------------------|-----------|-------------|
| A     | 0.22               | 44        | 22          |
| B     | 0.18               | 36        | 18          |
| C     | 0.40               | 80        | 40          |
| D     | 0.20               | 40        | 20          |
| Total | 1.00               | 200       | 100         |



And filling in the provided template:

Frequency and Percent Frequency Distribution

| Class | Relative Frequency | Frequency | % Frequency |
|-------|--------------------|-----------|-------------|
| A     | 0.22               | 44        | 22          |
| B     | 0.18               | 36        | 18          |
| C     | 0.40               | 80        | 40          |
| D     | 0.20               | 40        | 20          |
| Total | 1.00               | 200       | 100         |

Question 1 (8 points)

Computing Percentiles. Consider a sample with data values of 27, 25, 20, 15, 30, 34, 28, and 25. Compute the...



To compute percentiles, we first need to sort the data in ascending order.

The given data values are: 27, 25, 20, 15, 30, 34, 28, 25.

Step 1: Sort the data in ascending order.

Sorted data: 15, 20, 25, 25, 27, 28, 30, 34

Step 2: Determine the number of observations (n).

$n = 8$

Step 3: Calculate the position (*i*) for each percentile using the formula:

$i = (p/100) * n$

where *p* is the desired percentile.

- If *i* is an integer, the *p*-th percentile is the average of the *i*-th and (*i* + 1)-th values in the sorted data.
- If *i* is not an integer, round up to the next integer. The *p*-th percentile is the value at this position in the sorted data.

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1. Compute the 20th percentile:

$$p = 20$$

$$i = (20/100) * 8 = 0.20 * 8 = 1.6$$

Since  $i$  is not an integer, round up to 2. The 20th percentile is the 2nd value in the sorted data.

The 2nd value is 20.

**20th percentile = 20**

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2. Compute the 25th percentile:

$$p = 25$$

$$i = (25/100) * 8 = 0.25 * 8 = 2.0$$

Since  $i$  is an integer, the 25th percentile is the average of the 2nd and  $(2+1)=3$ rd values in the sorted data.

The 2nd value is 20.

The 3rd value is 25.

$$\text{Average} = (20 + 25)/2 = 45/2 = 22.5$$

**25th percentile = 22.5**

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3. Compute the 65th percentile:

$$p = 65$$

$$i = (65/100) * 8 = 0.65 * 8 = 5.2$$

Since  $i$  is not an integer, round up to 6. The 65th percentile is the 6th value in the sorted data.

The 6th value is 28.

**65th percentile = 28**

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4. Compute the 75th percentile:

$$p = 75$$

$$i = (75/100) * 8 = 0.75 * 8 = 6.0$$

Since  $i$  is an integer, the 75th percentile is the average of the 6th and  $(6+1)=7$ th values in the sorted data.

The 6th value is 28.

The 7th value is 30.

$$\text{Average} = (28 + 30)/2 = 58/2 = 29$$

**75th percentile = 29**

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Deep Research

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