<u>Contingency Tables</u>

A contingency table illustrates a two-variable distribution.
It is another way to display statistical data, like a scatter plot.

Ex: Here is some data about the **number of hours of sleep** (x) that a student gets before an exam and their **grade on the exam** (y).

$(2, 50)$ $(3, 50)$ $(4, 45)$ $(4, 35)$ $(5, 50)$ $(5, 53)$ $(6, 60)$ $(6, 45)$ $(7, 70)$ $(7, 64)$ $(8, 80)$ $(8, 55)$ $(8, 75)$ $(8, 78)$ $(8, 83)$ $(9, 79)$ $(9, 30)$ $(9, 89)$ $(9, 62)$ $(9, 93)$ $(9, 87)$ $(10, 85)$ $(10, 71)$
$(10, 92)$ $(10, 88)$

Do you think there is a correlation between the two variables?
Fill in the table:

Hours Slept (x) / Grade % (y)	2	3	4	5	6	7	8	9	10	Total
[30, 40[										
[40, 50[										
[50, 60[										
[60. 70[										
[70, 80[										
[80, 90[										
[90, 100[										
Total										

(2,50) (3,50) (4,45) (4,35) (5,50) (5,53) (6,60) (6,45) (7,70) (7,64) (8, 80) (8,55) (8,75) (8,78) (8,83) (9,79) (9,30) (9,89) (9,62) (9,93) (9,87) (10,85) (10,71) (10,92) (10,88)

Fill in the table:

[30, 40[
[40, 50[

Hours Slept (x) / Grade % (y)	2	3	4	5	6	7	8	9	10	Total
[30, 40[		1						1		2
[40, 50[			1	1						2
[50, 60[	1	1		11			1			5
[60. 70[					1	1		1		3
[70, 80[						1	11	1	1	5
[80, 90[							11	11	11	6
[90, 100[								1	1	2
Total	1	1	2	2	2	2	5	6	4	26

- Add up numbers in columns (down) and rows (across)
- Correlation exists if…

> **large numbers on the diagonal, small numbers (look for zeros) in the corners**

- the more obvious the pattern = stronger correlation
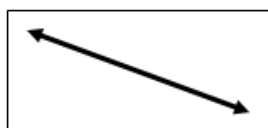
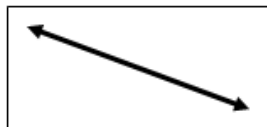Positive correlation: Negative correlation

Hours Slept (x) / Grade % (y)	2	3	4	5	6	7	8	9	10	Total
[30, 40[			1					1		2
[40, 50[			1		1					2
[50, 60[	1	1		2			1			5
[60. 70[					1	1		1		3
[70, 80[						1	2	1	1	5
[80, 90[							2	2	2	6
[90, 100[								1	1	2
Total	1	1	2	2	2	2	5	6	4	25

- Add up numbers in columns (down) and rows (across)
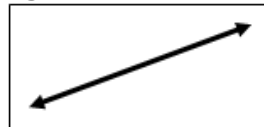- Correlation exists if…

large numbers on the diagonal, small numbers (look for zeros) in the corners

- the more obvious the pattern = stronger correlation

Positive correlation:

Negative correlation
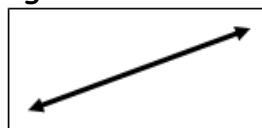
Grade % (y) \ Hours Slept (x)	2	3	4	5	6	7	8	9	10	Total
[30, 40[			1					1		2
[40, 50[			1		1					2
[50, 60[	1	1		2			1			5
[60. 70[					1	1		1		3
[70, 80[						1	2	1	1	5
[80, 90[							2	2	2	6
[90, 100[								1	1	2
Total	1	1	2	2	2	2	5	6	4	25

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2   } Homework
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