

§2.8 Graphing Bivariate Relationships

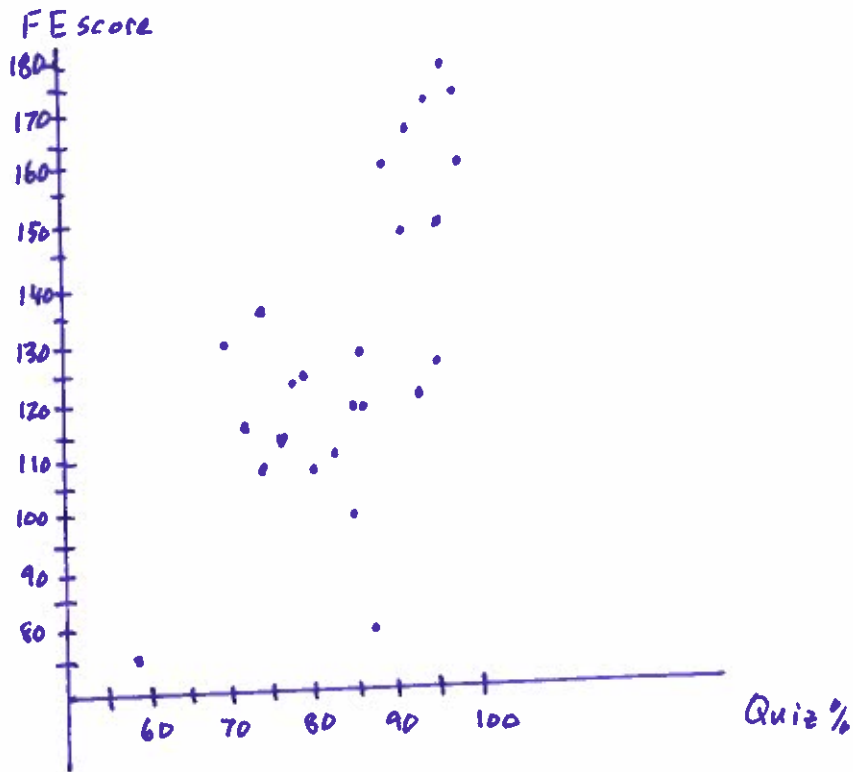
Sometimes claims are made that two (or more) quantities are related. Examples might be "smoking causes cancer", "exercise prolongs life" or "Doing homework helps on exams". Some of the vocabulary that is used are words like: correlated, related, and associated. ~~imply~~ These words imply a relationship between two (or more) variables.

In this section we construct scatterplots to get a visual idea about if two variables are related.

Example In the fall of 2021 ~~had she~~ a calculus II class took daily "short" quizzes instead of longer homework assignments. The students' mean quiz score (as a percent) and their final exam score are list below. Draw a scatterplot and "see" if the two values are related.

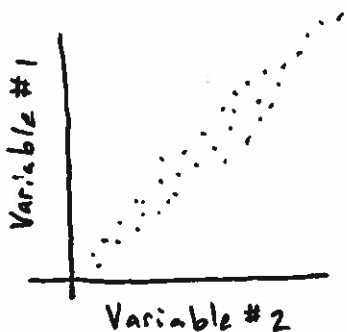
Student #	1	2	3	4	5	6	7	8	9	10	11	12	13
Quiz %	97	98	94	92	98	89	96	91	75	70	87	97	80
FE score	180	172	169	164	158	158	149	146	139	130	129	127	124

Student #	14	15	16	17	18	19	20	21	22	23	24	25
Quiz %	79	95	86	87	72	77	84	81	73	85	88	59
FE Score	123	119	118	118	116	114	112	105	105	97	78	76

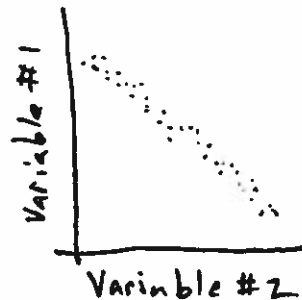


Here the data seems spread out, but there is a slight "upward and to the right" trend that may indicate that higher quiz scores is related to higher exam scores.

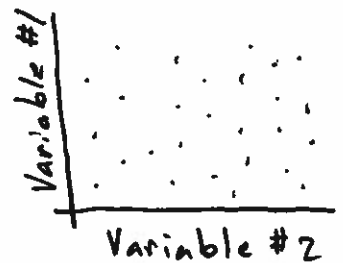
The following three scatterplots differentiate the type of relationships we will look for



Positive Relationship



Negative relationship



No relationship