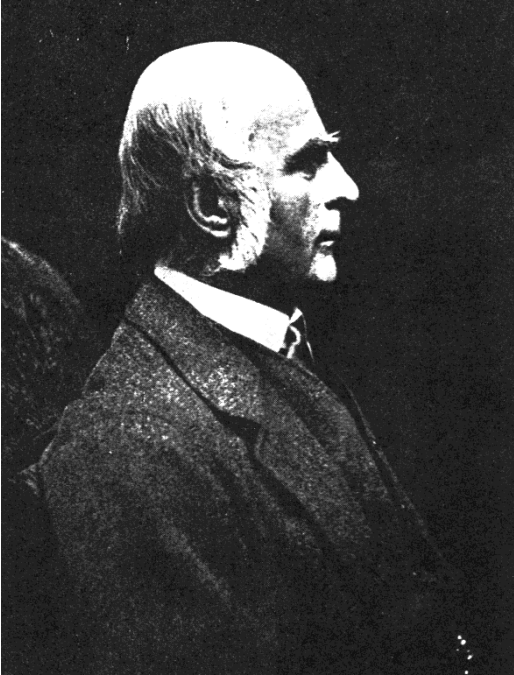


Homework Policies: You should give a brief and concise explanation for each question. Just writing down an answer with no explanation is usually not sufficient. If the homework requires output from Stata, incorporate that output into your written assignments. Homework is due at the *beginning* of class on the day indicated.

- (1) Of the following quantities, which ones are random variables (i.e., which have values that depend on the sample that is drawn)? No explanation is necessary.
- (a) the sample mean, \bar{x}
 - (b) the population mean, μ
 - (c) the endpoints of a confidence interval for μ , when the true population SD is known
 - (d) the endpoints of a confidence interval for μ , when the true population SD is unknown
 - (e) the width of a confidence interval for μ , when the true population SD is known
 - (f) the width of a confidence interval for μ , when the true population SD is unknown

NOTE: Width of a confidence interval = (upper endpoint – lower endpoint)

- (2) M&M 6.10, p. 369
- (3) M&M 6.20, p. 370
- (4) M&M 6.31, p. 371
- (5) M&M 6.32, p. 371
- (6) M&M 6.33, pp. 371-372
- (7) M&M 6.28, p. 399
- (8) M&M 7.25, p. 442 **Note: the data are in the Stata file called *mm7.25.dta* on the course webpage. You may use the “summarize” command to obtain the mean and SD. You may also use Stata to obtain the normal quantile plot**
- (9) M&M 8.7, p. 502
- (10) M&M 8.11, p. 502 **In part A, give the interpretation of the 95% confidence interval – not just the meaning of the level of confidence.**

Famous Statistician of the Week**Who is this dude?**

Sir Francis Galton
1822-1911

Why is he cool (or not so cool)?

An explorer and anthropologist, **Francis Galton** is known for his pioneering studies of human intelligence. He devoted the latter part of his life to eugenics, i.e. improving the physical and mental makeup of the human species by selected parenthood.

Although weak in mathematics his ideas strongly influenced the development of statistics particularly his proof that a normal mixture of normal distributions is itself normal. Another of his major findings was reversion. This was his formulation of regression and its link to the bivariate normal distribution.

He also made important contributions to the fields of meteorology, anthropometry, and physical anthropology. Galton was an indefatigable explorer and an investigator of human intelligence.

Galton, the cousin of Charles Darwin, was convinced that pre-eminence in various fields was due almost entirely to hereditary factors. He opposed those who claimed intelligence or character were determined by environmental factors. He inquired into racial differences, something almost unacceptable today, and was one of the first to employ questionnaire and survey methods, which he used to investigate mental imagery in different groups of people.

His work led him to advocate breeding restrictions.

Courtesy of <http://www-gap.dcs.st-and.ac.uk/~history/Mathematicians/Galton.html>