

Math 189: Homework 1

A First Report

Form groups and generate an R Markdown Notebook for the assignment, which examines the baby data set from lecture.

Metadata for *babies.dat*

- **bwt**: Baby's weight at birth, to the nearest ounce
- **gestation**: Duration of the pregnancy in days, calculated from the first day of the last normal menstrual period.
- **parity**: Indicator for whether the baby is the first born (1) or not (0).
- **age**: Mother's age at the time of conception, in years
- **height**: Height of the mother, in inches
- **weight**: Mother's prepregnancy weight, in pounds
- **smoking Indicator**: for whether the mother smokes (1) or not (0).

Tasks

1. Download *babies.dat* from the course GitHub
2. Load data and give proper data citation (see lecture notes)
3. Use the *head* command to examine the first few rows of the variables **bwt**, **age**, and **weight**
4. Define and display a submatrix **X** corresponding to the last 5 records (babies), for the variables **bwt**, **age**, and **weight**
5. For the above **X**, compute $\mathbf{A} = \mathbf{X}'\mathbf{X}$ in the notebook.
6. Compute and display \mathbf{A}^{-1} .
7. Compute and display the trace of **A**.
8. Prove whether **A** is positive definite or not.

Your R Markdown Notebook report should have a brief introduction, body, and discussion. Importantly, your code should run! (Note: the grader will check your *load* code by changing the path.)