Assignment Mathematical Modeling

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Exercise 04:

Tests exist to measure the percentage of body fat. Assume that such tests are accurate and that a great many carefully collected data are available. You may specify any other statistics, such as waist size and height, that you would like collected. Explain how the data could be arranged to check the assumptions underlying the sub models in this section. For example, suppose the data for males between ages 17 and 21 with constant body fat and height are examined. Explain how the assumption of constant density of the inner core could be checked.

Solution:

Describe in detail the data you would like to obtain to test the various sub models supporting Model (2.21). How would you go about collecting the data?

It is important to consider the following as criteria:

- The sub model can be tested by grouping the persons who are considerably the same height and of same weight
- The sub model can be tested by taking into consideration the geometrically symmetric persons.
- The height and the corresponding weight are correlated and their significance are identified.

- The data that can be collected with regard to the above said criteria are measure the height and weight of the persons individually and record the same.
- Before measuring the height and weight the persons are identified according to their age group. Since we normally find that the age of person relates to their corresponding height and weight.
- Further data can be collected by looking into their characteristics like their agility stamina, energy level, fitness etc.

The model that represented by the form below:

$$w = k_1 + k_2 h^2 + k_3 h^3 \quad where \ k_1, k_3 > 0 \ , \ k_2 \geq 0$$

Where w represent as the weight

h represent as the height

k_1, k_2, k_3 represent as the proportional slope.