

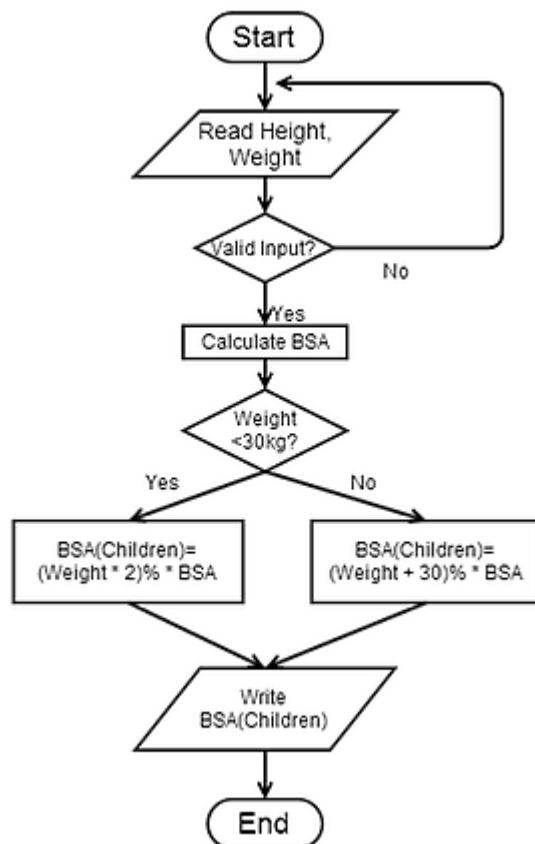
## Report of CS580 Assignment 3

Yongji Li

Multiple algorithms for calculating drug dosage for children have been discussed in (Lack and Stuart-Taylor, 17). Note: Average adult BSA is around 1.73 m<sup>2</sup>. Your work on this assignment will be the basis for Assignment 5.

- 1) Draw a flow chart to facilitate a software developer to implement a program using BSA-based children drug dosage calculation method (including the calculation of BSA).

Answer:



$BSA \text{ (cm}^2\text{)} = 71.84 \times \text{Height(cm)}^{0.725} \times \text{Weight(kg)}^{0.425}$  By DuBois and DuBois's<sup>1</sup>'s equation.

- 2) Implement a simple universal BSA calculator. The focus is not on programming skills. Any form of implement is fine, for example Excel, or a command program.

Answer:

The attached txt file "BSA.txt" is my solution. The programming language is JavaScript. And I used Twitter bootstrap framework(bootstrap.css and bootstrap.js) to make the user interface friendly and colorful.

**How to run:** Please rename this file "BSA.html" and then open it by a web browser such as Chrome or IE Explorer or Firefox.

The screen-shot of this software:

(1) The user who is 5'4" and 140 lbs. His/her BMI is shown as follows.

## Universal Body Surface Area (BSA) Calculator

Click on the Tabs to enter your weight and height using standard or metric measures..

Standard
metric

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**Height:(feet)**

**Height:(inch)**

**Weight(lb)**

Calculate BSA
Reset

**DuBois and DuBois<sup>1</sup> : (m<sup>2</sup>)**

**Gehan and George<sup>2</sup> : (m<sup>2</sup>)**

**Haycock<sup>3</sup> : (m<sup>2</sup>)**

**Mosteller<sup>4</sup> : (m<sup>2</sup>)**

DuBois and DuBois<sup>1</sup> :

Equation:  $BSA(m^2) = 0.007184 * Height(cm)^{0.725} * Weight(kg)^{0.425}$

Gehan and George<sup>2</sup> :

Equation:  $BSA(m^2) = 0.0235 * Height(cm)^{0.42246} * Weight(kg)^{0.51456}$

Haycock<sup>3</sup> :

Equation:  $BSA(m^2) = 0.024265 * Height(cm)^{0.3964} * Weight(kg)^{0.5378}$

Mosteller<sup>4</sup> :

Equation:  $BSA(m^2) = [(Height(cm) * Weight(kg))/3600]^{0.5}$

(2)The user who is 187 cm and 87 kgs. His/her BMI is shown as follows.

## Universal Body Surface Area (BSA) Calculator

Click on the Tabs to enter your weight and height using standard or metric measures..

Standard
metric

---

**Height:(cm)**

**Weight(Kg)**

Calculate BSA
Reset

**DuBois and DuBois<sup>1</sup> : (m<sup>2</sup>)**

**Gehan and George<sup>2</sup> : (m<sup>2</sup>)**

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Equation:  $BSA(m^2) = [(Height(cm) * Weight(kg))/3600]^{0.5}$

### References:

- 1) DuBois D, DuBois DF. A formula to estimate the approximate surface area if height and weight be known. Arch Int Med 1916;17:863-71.
- 2) Gehan EA, George SL. Estimation of human body surface area from height and weight. Cancer Chemother Rep 1970;54:225-35.

3) Haycock GB, Schwartz GJ, Wisotsky DH. Geometric method for measuring body surface area: A height-weight formula validated in infants, children and adults. J Pediatr 1978;93:62-6.

4) Mosteller RD. Simplified calculation of body-surface area. N Engl J Med 1987;317:1098.

5) Twitter Bootstrap framework. <http://getbootstrap.com/>

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