The relationship between height and arm-span in both sexes and different ethnic groups was studied to assess whether arm-span can be used as an indicator for height. Some differences exist in the arm-span-to-height relationship for both sexes of Afro-Caribbean people and for Asian males. Otherwise, the correlation shows a clear association with   
r = 0.73-0.89.

Reference: http://www.ncbi.nlm.nih.gov/pubmed/8793422

Math 125 Males (n=5)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| X: Arm-span | 72 | 76 | 78 | 77 | 74 |
| Y: Height | 71 | 72 | 76 | 76 | 74 |

Math 125 Randomly Selected Females (n=5)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| X: Arm-span | 68 | 67.5 | 54 | 57 | 63.5 |
| Y: Height | 67 | 67 | 63 | 65.5 | 66 |

Draw a scatterplot of height by arm-span. Use different symbols or colors for males and females.

|  |
| --- |
|  |

**Calculate the correlation between arm-span and height for Math 125 men.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| X: Arm-span | 72 | 76 | 78 | 77 | 74 |
| Y: Height | 71 | 72 | 76 | 76 | 74 |

1. Calculate x̄, the mean of all the data xi. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Calculate sx the sample standard deviation of all xi. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Calculate ȳ, the mean of all the data yi. \_\_\_\_\_\_\_\_\_\_\_\_\_\_­­\_\_
4. Calculate sy the sample standard deviation of all yi. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Calculate a standardized\* value for each (a) xi and (b) yi. (fill in table below)
6. Multiply corresponding standardized values: (fill in table below)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 5a. |  | 5b. | 6. |
| xi | (xi – x̄) / sx | yi | (yi – ȳ) / sy | (5a)i × (5b)i |
| 72 |  | 71 |  |  |
| 76 |  | 72 |  |  |
| 78 |  | 76 |  |  |
| 77 |  | 76 |  |  |
| 74 |  | 74 |  |  |
| SUM: | | | |  |
| r = SUM/(n-1): | | | |  |

\*A standardized value for a particular data value tells how many standard deviations the value is above or below the mean.

**Calculate the correlation between arm-span and height for Math 125 random sample of five women.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| X: Arm-span | 68 | 67.5 | 54 | 57 | 63.5 |
| Y: Height | 67 | 67 | 63 | 65.5 | 66 |

1. Calculate x̄, the mean of all the data xi. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Calculate sx the sample standard deviation of all xi. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Calculate ȳ, the mean of all the data yi. \_\_\_\_\_\_\_\_\_\_\_\_\_\_­­\_\_
4. Calculate sy the sample standard deviation of all yi. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Calculate a standardized\* value for each (a) xi and (b) yi. (fill in table below)
6. Multiply corresponding standardized values: (fill in table below)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 11a. |  | 11b. | 12. |
| xi | (xi – x̄) / sx | yi | (yi – ȳ) / sy | (11a)i × (11b)i |
| 68 |  | 67 |  |  |
| 67.5 |  | 67 |  |  |
| 54 |  | 63 |  |  |
| 57 |  | 65.5 |  |  |
| 63.5 |  | 66 |  |  |
| SUM: | | | |  |
| r = SUM/(n-1): | | | |  |

\*A standardized value for a particular data value tells how many standard deviations the value is above or below the mean.