# M1.10 – Understanding measures of dispersion including standard deviation and range

### Quiz

1. Below are the ages (in months) of Queen ants of the genus *Cardiocondyla* from two geographically isolated populations. For each population a random sample of 11 queens was taken and the ages recorded. Calculate the mean age and standard deviation for queens from each population. Which of these two populations has the smallest standard deviation?

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Queen ant** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| Queen age in months | Population **A**  | 6 | 8 | 10 | 8 | 9 | 6 | 7 | 12 | 14 | 11 | 9 |
| Population **B** | 8 | 8 | 9 | 14 | 16 | 9 | 15 | 13 | 12 | 11 | 8 |

Based on these samples we estimate the means and standard deviations for queen ages in the two populations to be:

Popn **A** , Mean = 9.1 months, S.D. = 2.5 months

Popn **B**, Mean = 11.2, months S.D. = 3.0 months

Popn **A** has the smaller standard deviation

1. The vertical jump height (mm) was measured of two separate populations (A & B) of fleas. Below are two histograms of the distributions of jump heights in the two populations. Both populations had a normal distribution around a common mean jump height of 100mm. Which population has the greatest standard deviation?

A)

B)

Population B has the greatest spread of data around the mean, and therefore will have a higher standard deviation

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