The Bona Fide Washing Machine Company knows that the standard deviation of the lengths of life of motors received from supplier I is 400 hours.

1. Calculate the 90% percent confidence interval for the mean number length of life motors received from this supplier, based on a sample of 40 motors for which the mean length of time was 4500 hours.

The problem specifies that the population standard deviation $\sigma = 400$, sample size is $n = 40$ (thus large enough to apply CLT), sample mean $\bar{X} = 4500$.

Since the confidence level $C = 90\%$, we have that $\alpha = 10\%$ (or 0.1), thus $\alpha/2 = 0.05$. From the normal table (Table A), we get that $z^* = 1.64$ and hence the 90% confidence interval is

$$\bar{X} \pm z^* * \sigma / \sqrt{n} = 4500 \pm 1.64 * 400 / \sqrt{40} = (4396.28, 4603.72)$$

2. Interpret the confidence interval in the context of the problem.

We can be 90% confident that the true mean length of life of motors received from this supplier is between 4396.28 and 4603.72 hours.