



ASSIGNMENT 6
CCS226-18
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2BSCS-1



THE MEAN HEIGHTS OF 50 SAILORS IS 171.45 CM WITH A STANDARD DEVIATION OF 7.11 CM WHILE THE MEAN HEIGHTS OF 50 SOLDIERS IS 173.2 CM WITH A STANDARD DEVIATION OF 6.35 CM. TEST THE HYPOTHESIS THAT SAILORS ARE SHORTER THAN SOLDIERS USING A LEVEL OF SIGNIFICANCE OF 0.05.

$$H_0: \mu_1 > \mu_2$$

$$H_1: \mu_1 < \mu_2$$

Given:

$$n_1 = 50 \text{ sailors}$$

$$n_2 = 50 \text{ soldiers}$$

$$\mu_1 = 171.45 \text{ cm}$$

$$\mu_2 = 173.2 \text{ cm}$$

$$\sigma_1 = 7.11 \text{ cm}$$

$$\sigma_2 = 6.35 \text{ cm}$$

$$\alpha = 0.05$$

$$Z_{\alpha} = -1.645$$

Formulas:

$$SE = \sqrt{(\sigma_1^2 / n_1) + (\sigma_2^2 / n_2)}$$

$$Z = (\mu_1 - \mu_2) / SE$$

Solution:

$$SE = \sqrt{(7.11^2 / 50) + (6.35^2 / 50)} \\ = 1.1153$$

$$Z = (171.45 - 173.2) / 1.1153 \\ = -1.569$$

*This will be a left tailed test

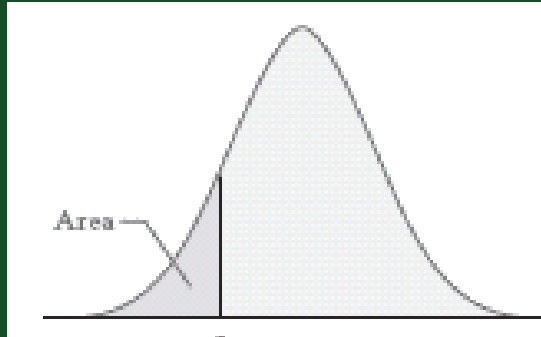


Table IV
Standard Normal Distribution

z	.00	.01	.02	.03	.04	.05
-3.4	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
-3.3	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004
-3.2	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006
-3.1	0.0010	0.0009	0.0009	0.0009	0.0008	0.0008
-3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011
-2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016
-2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022
-2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030
-2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040
-2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054
-2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071
-2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094
-2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122
-2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158
-2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202
-1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256
-1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322
-1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401
-1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495
-1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606

Decision Rule: Accept null Hypothesis if
 $z > -1.645$;
otherwise reject
null hypothesis

*Since $z = -1.569$, z is greater than
 -1.645 , meaning that the
null hypothesis was not rejected

There was not enough
evidence to prove the claim
that the sailors are shorter
than the soldiers. Hence, the
researchers failed to reject
the null hypothesis

