IS I Ü11

2) Shock absorbers

Car #	Manufacturer	Competitor	Difference
1	8,8	8,4	0,4
2	10,5	10,1	0,4
3	12,5	12,0	0,5
4	9,7	9,3	0,4
5	9,6	9,0	0,6
6	13,2	13,0	0,2

We consider the difference, as the data is dependent (because the same car is used).

$H_0: \mu_d = 0$ vs. $H_1: \mu_d \neq 0$ $\quad \alpha = 0,05$

$\hat{\mu} = \frac{1}{6}(0,4+0,4+0,5+0,4+0,6+0,2) = 0,4167$

$s^2 = \frac{1}{6-1}((0,2-\hat{\mu})^2 + 3(0,4-\hat{\mu})^2 + (0,5-\hat{\mu})^2 + (0,6-\hat{\mu})^2) = 0,0177$

$z = \frac{\hat{\mu}-0}{\frac{s}{\sqrt{n}}} = \frac{0,4167}{\frac{0,1329}{\sqrt{6}}} = 7,6802$

$z_{\alpha/2} = \Phi(0,025) = 1,96 \quad \Rightarrow |z| > z_{\alpha/2}$

We reject the null hypothesis