Assignment 3

Question 1

t	e_t	e_{t-1}	$(e_t - e_{t-1})^2$	e_t^2
1	0.2		0	0.04
2	0.3	0.1	0.01	0.09
3	-0.8	-1.1	1.21	0.64
4	-0.8	0	0	0.64
5	-0.3	0.5	0.25	0.09
6	0.4	0.7	0.49	0.16
7	0.1	-0.3	0.09	0.01
8	-0.1	-0.2	0.04	0.01
9	-0.4	-0.3	0.09	0.16
10	-0.7	-0.3	0.09	0.49
11	0.6	1.3	1.69	0.36
12	-0.1	-0.7	0.49	0.01
13	-0.1	0	0	0.01
14	0.3	0.4	0.16	0.09
15	0.2	-0.1	0.01	0.04
sum			4.62	2.84

$$d = \frac{\sum_{2}^{15}(e_t - e_{t-1})^2}{\sum_{1}^{15} e_t^2} = \frac{4.62}{2.84} = 1.6268$$

$\alpha = 0.1$

$\alpha/2 = 0.05$

① H_0: No autocorrelation

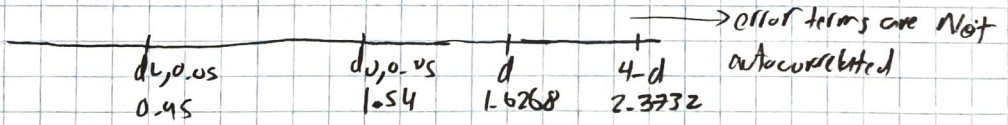
H_a: The error terms are positively or negatively autocorrelated

$k-1 = 2$

$n = 15$

$d_{L,0.05} = 0.95$

$d_{U,0.05} = 1.54$

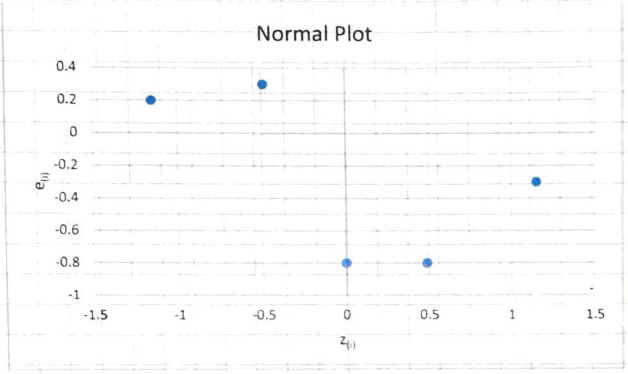


since $d = 1.6268 > d_{U,0.05} = 1.54$ & since $4-d = 2.3732 > d_{U,0.05} = 1.54$,

We fail to reject H_0. Therefore, the error terms are not autocorrelated.

2.

i	e	(3i -1)/(3n+1)	z
1	0.2	0.125	-1.150349
2	0.3	0.3125	-0.4887764
3	-0.8	0.5	0
4	-0.8	0.6875	0.4887764
5	-0.3	0.875	1.150349



Since the plot is not a straight line pattern, there is a violation of A4, and thus the normality assumption does not hold.