

## Auto-Correlation Test (Algorithm)

**Step-1:** Define the hypothesis for uniformity.

$H_0: \rho_i = 0 \rightarrow$  No's independent

$H_1: \rho_i \neq 0 \rightarrow$  No's aren't independent

**Step-2:** Find  $i$  and lag  $m$ .

Here,  $i$  = initial no.

lag  $m$  = constant (harmony projection)

Geometry projection

**Step-3:** Using  $i$ ,  $m$ ,  $N$  find  $M \rightarrow$   
**largest integer** by  $i + (M+1)m \leq N$

$N \rightarrow$  total no of values in the sequence

**Step-4:**  $\hat{\rho}_{im} = \frac{1}{M+1} \left[ \sum_{k=0}^M R_{i+km}, R_{i+[k+1]m} \right] - 0.25$

**Step-5:** Find the S.D pf the estimator,

$$\sigma_{\hat{p}_m} = \frac{\sqrt{13M+7}}{12(M+1)}$$

**Step-6:**  $Z_0 = \frac{\hat{\rho}_{im}}{\sigma_{\hat{p}_m}}$

**Step-7:** Determine  $+Z_{\alpha/2}$ ,  $-Z_{\alpha/2}$

**Step-8:** If  $-Z_{\alpha/2} \leq Z_0 \leq +Z_{\alpha/2} \rightarrow H_0$  isn't rejected.

0.12, 0.01, 0.23, 0.28, 0.89, 0.31, 0.64, 0.28, 0.83, 0.93, 0.99, 0.15,  
0.33, 0.35, 0.91, 0.41, 0.60, 0.27, 0.75, 0.88, 0.68, 0.49, 0.05, 0.43,  
0.95, 0.58, 0.19, 0.36, 0.69, 0.87. ( $\alpha=0.025$ , Test No=3 at position 3<sup>rd</sup>,  
8<sup>th</sup>, 13<sup>th</sup> are auto correlated)       $N=30$