Seeds $= X_i$, Multiplier $= a$, Increment $= c$, Modulus $= m$

$$X_{i+1} = (aX_i + c)\,mod(m);\ i = 0,1,2,3, \dots$$

| | | |
|---|---|---|
| $X_o$ | $=$ | 3 |
| $a$ | $=$ | 13 |
| $c$ | $=$ | 0 |
| $m$ | $=$ | 64 |

Class Activity: 18th December, 2024 CS312 Computer Simulation , with N=10

| Sr | Xn | Mod Value | Random Number |
|---|---|---|---|
| 1 | 39 | 39 | 0.609 |
| 2 | 507 | 59 | 0.922 |
| 3 | 767 | 63 | 0.984 |
| 4 | 819 | 51 | 0.797 |
| 5 | 663 | 23 | 0.359 |
| 6 | 299 | 43 | 0.672 |
| 7 | 559 | 47 | 0.734 |
| 8 | 611 | 35 | 0.547 |
| 9 | 455 | 7 | 0.109 |
| 10 | 91 | 27 | 0.422 |

Convert to smallest to largest

**Step 01**

Random Number (Reorder)
0.109
0.359
0.422
0.547
0.609
0.672
0.734
0.797
0.922
0.984

| i | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| R(i) | 0.109375 | 0.359375 | 0.421875 | 0.546875 | 0.609375 | 0.671875 | 0.734375 | 0.796875 | 0.921875 | 0.984375 |
| i/N | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 |
| Step 02 $D^+ = \dfrac{i}{N} - R_i$ | -0.01 | -0.16 | -0.12 | -0.15 | -0.11 | -0.07 | -0.03 | 0.00 | -0.02 | 0.02 |
| $D^- = R_i - \dfrac{i-1}{N}$ | 0.109375 | 0.259375 | 0.221875 | 0.246875 | 0.209375 | 0.171875 | 0.134375 | 0.096875 | 0.121875 | 0.084375 |

$\alpha = -\!-\!\rightarrow$ Confidence Interval $=$ 0.25

| Step 3: $D = \max(D^+, D^-)$ | 0.11 | 0.26 | 0.22 | 0.25 | 0.21 | 0.17 | 0.13 | 0.10 | 0.12 | 0.08 |
|---|---|---|---|---|---|---|---|---|---|---|
| | This is a random number | Not a Random Number | This is a random number | This is a random number | This is a random number | This is a random number | This is a random number | This is a random number | This is a random number | This is a random number |