

WhichDist — Input Analysis Lab Report

- **Generated:** 2026-08-08T19:11:03.404Z
- **Source range:** Sample library — Arrivals per minute (counts)
- **WhichDist version:** 1.0.0

1. Data description

Item	Value
Sample size n	60
Min / Max	0 / 8
Mean / Median	3.3667 / 3
Std. dev. / CV	1.7942 / 0.5329
Skewness / Kurtosis	0.3614 / -0.3112

2. Nature of data (wizard)

Question	Answer
Continuous / discrete	discrete
Theoretical support	nonnegative
Integer-valued	yes
Engineering major(s)	Industrial Engineering / OR / Simulation

Candidate Policy: You described the data as discrete with non-negative ($x \geq 0$) support. Engineering context: Industrial Engineering / OR / Simulation. The Core catalog is unioned with the selected discipline pack(s), adding Geometric, Discrete Uniform. Candidates that match the data nature and support: Poisson, Binomial, Geometric, Discrete Uniform. The Empirical distribution is always available as a non-parametric reference. Recommendation is the best supported among these candidates — not a claim of the one true distribution.

3. Method

Candidates = Core catalog $\cup$ selected major packs, filtered by support and data nature. Parameters estimated by maximum likelihood (method of moments where noted). Models ranked by an **AICc-led composite**, with **Anderson–Darling** and **Kolmogorov–Smirnov**

reported for continuous fits (χ^2 for discrete). The recommendation is the **best supported among candidates** — not a claim of the uniquely true law.

4. Recommended model

Field	Value
Distribution	Poisson
Parameters	$\lambda=3.3667$
Estimation	MLE
Log-likelihood	-118.519
AICc / AIC / BIC	239.11 / 239.04 / 241.13
χ^2 (df) / p	0.1589 (4) / 0.997

Why this family: Counts of independent events in a fixed interval. Arrivals per hour, defects per unit. Assumptions to check: Constant rate, independent events (mean $\approx$ variance).

5. Comparison (top candidates)

Rank	Distribution	Key params	AICc	AD	KS	χ^2
1	Poisson	$\lambda=3.3667$	239.11	—	—	0.1589
2	Binomial	$n=8, p=0.4208$	248.81	—	—	4.6668
3	Discrete Uniform	$a=0, b=8$	267.88	—	—	25.5

6. Simulation code snippets

Ready-to-paste definitions of **Poisson** ($\lambda=3.3667$) for common analysis and simulation tools. Simulation-tool expressions state their parameter convention explicitly; families without a native function fall back to inverse-CDF guidance.

Excel

```
=POISSON.DIST(x, 3.366667, FALSE)
```

Python (SciPy)

```
stats.poisson(mu=3.366667)
```

R

```
rpois(n, lambda=3.366667)
```

Arena

```
POIS(3.366667)
```

Simio

```
Random.Poisson(3.366667)
```

AnyLogic

```
poisson(3.366667)
```

7. Assumptions checklist

- ☐ Observations treated as i.i.d. (independence reviewed)
 - ☐ Support of the chosen family matches physical constraints
 - ☐ Sample size adequate for the claimed goodness-of-fit interpretation
 - ☐ Process meaning reviewed (e.g. memoryless if Exponential)
 - ☐ Runner-up considered; justification recorded if not using rank #1
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