

# Algorithm Selection Decision Tree

## Clustering Algorithm Selection Guide

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START: Do you know the number of clusters?  
  └─ YES: Do clusters have spherical shape?  
    └─ YES: Are clusters similar size?  
      └─ YES → Use K-means (fast, reliable)  
      └─ NO → Use Hierarchical (handles size variation)  
    └─ NO: Is data noisy?  
      └─ YES → Use DBSCAN (robust to noise)  
      └─ NO → Try Spectral clustering  
  
  └─ NO: Is noise a major concern?  
    └─ YES → Use DBSCAN (automatic noise detection)  
    └─ NO: Do you need hierarchy?  
      └─ YES → Use Agglomerative clustering  
      └─ NO: Try multiple algorithms  
        └─ Start with K-means + elbow method  
        └─ Validate with DBSCAN  
        └─ Compare results
```

### Dataset Size Considerations:

- Small (<1,000): Any algorithm
- Medium (1K-10K): All algorithms work
- Large (>10K): Prefer K-means or Mini-batch variants