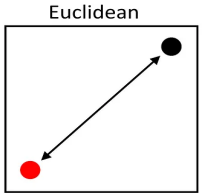
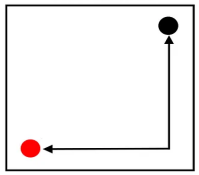
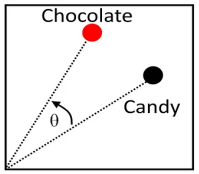
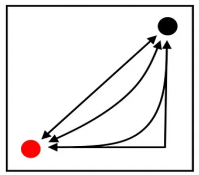
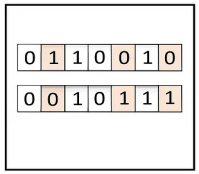
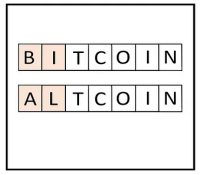
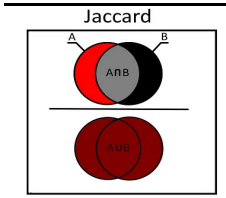
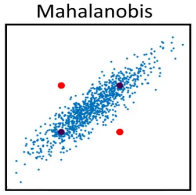
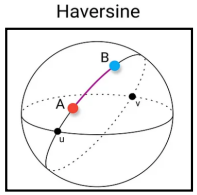
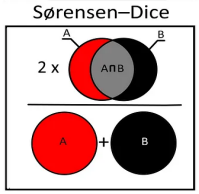
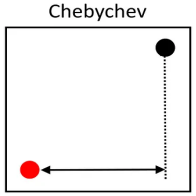
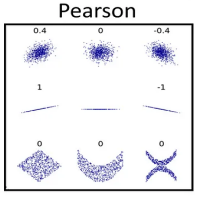
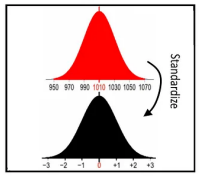
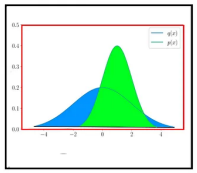
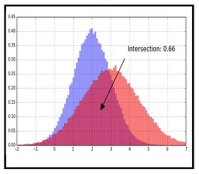
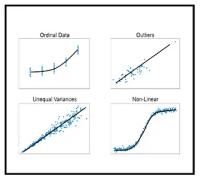
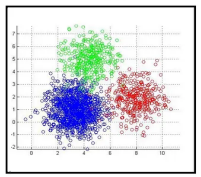
Picture	Distance Measure	Application	Features	Disadvantages	Formula
	**Euclidean Distance**	General distance measurement, Clustering, classification, regression	Measures the straight line distance between two points in n-dimensional space.	Sensitive to outliers, Can be affected by scale differences	sqrt(sum((p1 - p2)^2)) O(n) Fast
	**Manhattan Distance**	Distance on grid networks, Routing algorithms, Image processing	Measures the distance between two points on a grid network, where movement is limited.	Only takes into account differences in individual coordinates, Ignores diagonal movement, May not be as useful for high-dimensional data	sum(abs(p1 - p2)) O(n) Fast
	**Cosine Similarity**	Text document clustering, Text analysis, Recommendation systems	Measures the cosine of the angle between two vectors	Ignores magnitude of vectors, May not be as useful for negative values or data with a high degree of correlation	dot product(p1, p2) / (norm(p1) * norm(p2)) O(n) Fast
	**Minkowski Distance**	General distance measurement	Measures the distance between two points in n-dimensional space, where r determines the metric used.	Sensitive to outliers	(sum(abs(p1 - p2)^r))^(1/r) O(n) Fast
	**Hamming Distance**	Measuring string similarity, Error-correcting codes, DNA sequencing	Measures the number of positions at which the corresponding symbols are different.	Only for same length strings, May not be as useful for continuous data	sum(p1 != p2) O(n) Fast
	**Levenshtein Distance**	Measuring string similarity	Measures the minimum number of single-character edits required to transform one string into another.	More expensive for long strings	Dynamic Programming O(n^2) Slow

Picture	Distance Measure	Application	Features	Disadvantages	Formula
	**Jaccard Similarity**	Set similarity measurement, Text analysis, recommendation systems	Measures the similarity between two sets by comparing their intersection and union.	Ignores magnitude of sets, May not be as useful for continuous data	(p1 intersection p2) / (p1 union p2) O(n) Fast
	**Mahalanobis Distance**	Multivariate statistical analysis, Outlier detection, Clustering	Measures the distance between two points in n-dimensional space, taking into account the correlation between variables.	Requires full covariance matrix, May not be as useful for datasets with a large number of variables	sqrt((p1 - p2)' S^-1 (p1 - p2)) O(n^3) Slow
	**Haversine Distance**	Measuring distance on a sphere, Geographic calculations	Measures the great-circle distance between two points on a sphere, such as the Earth.	May not be as useful for small distances or for applications where a spherical Earth is not an accurate representation	2r * arcsin(sqrt(sin^2((lat2-lat1)/2) + cos(lat1) * cos(lat2)* sin^2((lon2-lon1)/2))) O(1) Slow
	**Sørensen-Dice Index**	Measuring similarity of sets, Ecology, biology, genetics	Measures the similarity between two sets	May not be as useful for continuous data and Ignores magnitude of sets	2 * size(intersection(p1, p2)) / (size(p1) + size(p2)) O(n) Fast
	**Chebyshev Distance**	Measuring maximum difference, Clustering, anomaly detection	Measures the maximum difference between corresponding components of two vectors	Only applicable for continuous data, Sensitive to outliers, may not be as useful for highly correlated data	max(abs(p1 - p2)) O(n) Fast
	**Pearson Correlation**	Measuring linear correlation	Measures the linear correlation between two variables in a dataset.	Requires linear correlation	cov(p1, p2) / (std(p1) * std(p2)) O(n^2) Slow

Picture	Distance Measure	Application	Features	Disadvantages	Formula
SED 	**Squared Euclidean Distance**	Clustering algorithms	Measures the square of the straight line distance between two points in n-dimensional space.	More sensitive to outliers	sum((p1 - p2)^2) O(n) Fast
Jensen-Shannon 	**Jensen-Shannon Divergence**	Measuring similarity of probability distributions. Commonly used in clustering and recommendation systems	symmetric measure used to compare probability distributions. considers both similarities and differences between the distributions	Only applicable for non-negative vectors	sqrt(JS(p1||p3)/2 + JS(p2||p3)/2) O(n) Slow
Chi-Square 	**Chi-Square Distance**	Measuring similarity of histograms	Measures the distance between two histograms by comparing their Chi-Square divergence.	Only applicable for non-negative vectors	sum((p1 - p2)^2 / (p1 + p2)) / 2 O(n) Fast
Spearman 	**Spearman Correlation**	Measuring rank correlation	Measures the correlation between two variables in a dataset based on their rank order.	Only applicable for ordinal data	cov(rank(p1), rank(p2)) / (std(rank(p1)) * std(rank(p2))) O(n log n) Fast
Canberra 	**Canberra Distance**	Measuring distance for sparse data	Measures the distance between two vectors, taking into account their relative magnitudes.	More sensitive to small differences	sum(abs(p1 - p2) / (abs(p1) + abs(p2))) O(n log n) Fast