

## Porcupine (Mammal)

	Body Temperature, d1	Skin cover, d2	Gives Birth, d3	Aquatic, d4	Aerial, d5	Has legs, d6	Hibernates, d7	Count of mismatches	Euclidean Distance
P-Human	0	1	0	0	0	0	1	2	1.4
P-python	1	1	1	0	0	1	0	4	2
P-Salmon	1	1	1	1	0	1	1	6	2.4
P-Whale	0	1	0	1	0	1	1	4	2
P-Frog	1	1	1	1	0	0	0	4	2
P-Komodo	1	1	1	0	0	0	1	4	2
P-Bat	0	1	0	0	1	0	0	2	1.4
P-Pigeon	0	1	1	0	1	0	1	4	2
P-Cat	0	1	0	0	0	0	1	2	1.4
P-Shark	1	1	0	1	0	1	1	5	2.2
P-Turtle	1	1	1	1	0	0	1	5	2.2
P-Penguin	0	1	1	1	0	0	1	4	2

Euclidean distance :  $\sqrt{d1^2 + d2^2 + d3^2 + d4^2 + d5^2 + d6^2 + d7^2}$

When comparing corresponding training record attributes to testing sample attributes  $d_n$  is given the value of 1 for mismatch and value of 0 for a match.

K = 1

Closest neighbor can be one of the following :

Human (M), Bat (M), Cat (M)

They share the same Euclidean distance 1.4

Porcupine class = M

K=2

Closest neighbors list: {Human (M) or Bat (M) or Cat (M), Human (M) or Bat (M) or Cat (M)}

Porcupine class = M

K = 3

Closest neighbors list: {Human (M) or Bat (M) or Cat (M), Human (M) or Bat (M) or Cat (M), Human (M) or Bat (M) or Cat (M)}

Porcupine class = M

## Salamander (Amphibian)

	Body Temperature, d1	Skin cover, d2	Gives Birth, d3	Aquatic, d4	Aerial, d5	Has legs, d6	Hibernates, d7	Count of mismatches	Euclidean Distance
S-Human	1	1	1	1	0	0	1	5	2.2
S-python	0	1	0	1	0	1	0	3	1.7
S-Salmon	0	1	0	1	0	1	1	4	2
S-Whale	1	1	1	1	0	1	1	6	2.4
S-Frog	0	0	0	0	0	0	0	0	0
S-Komodo	0	1	0	1	0	0	1	3	1.7
S-Bat	1	1	1	1	1	0	0	5	2.2
S-Pigeon	1	1	0	1	1	0	1	5	2.2
S-Cat	1	1	1	1	0	0	1	5	2.2
S-Shark	0	1	1	1	0	1	1	5	2.2
S-Turtle	0	1	0	0	0	0	1	2	1.4
S-Penguin	1	1	0	0	0	0	1	3	1.7

K = 1

Closest neighbor:

Frog(A)

Salamander class = A

K=2

Closest neighbors list : { Frog (A), Turtle (R)}

Salamander class can be predicted either A or R

K = 3

Closest neighbors list: { Frog (A), Turtle (R), Python (R) or Komodo (R) or Penguin (B)}

Frog (A), Turtle (R), Python (R) -> Salamander class = R

Frog (A), Turtle (R), Komodo (R) -> Salamander class= R

Frog (A), Turtle (R), Penguin (B) -> Salamander class can be predicted either A, R or B

## Eel (Fish)

	Body Temperature, d1	Skin cover, d2	Gives Birth, d3	Aquatic, d4	Aerial, d5	Has legs, d6	Hibernates, d7	Count of mismatches	Euclidean Distance
E-Human	1	1	1	1	0	1	0	5	2.2
E-python	0	0	0	1	0	0	1	2	1.4
E-Salmon	0	0	0	0	0	0	0	0	0
E-Whale	1	1	1	0	0	0	0	3	1.7
E-Frog	0	1	0	1	0	1	1	4	2
E-Komodo	0	0	0	1	0	1	0	2	1.4
E-Bat	1	1	1	1	1	1	1	7	2.6
E-Pigeon	1	1	0	1	1	1	0	5	2.2
E-Cat	1	1	1	1	0	1	0	5	2.2
E-Shark	0	0	1	0	1	0	0	2	1.4
E-Turtle	0	0	0	1	0	1	0	2	1.4
E-Penguin	1	1	0	1	0	1	0	4	2

K = 1

Closest neighbor:

Salmon(F)

Eel class = Fish

K=2

Closest neighbors list : {Salmon (F), Shark (F) or Python (R) or Komodo (R) or Turtle (R)}

If Salmon (F), Shark (F) will be chosen then Eel class = Fish,

otherwise it can be predicted as either Fish or Reptile

K = 3

Closest neighbors list : {Salmon (F), Shark (F) or Python (R) or Komodo (R) or Turtle (R)}, Shark (F) or Python (R) or Komodo (R) or Turtle (R)}

Salmon(F), Komodo (R), Python (R) -> Eel class = R

Salmon(F), Komodo (R), Shark (F) -> Eel class = F

Salmon(F), Komodo (R), Turtle (R) -> Eel class = R

Salmon (F), Python (R), Komodo (R) -> Eel class = R

Salmon (F), Python (R), Shark (F) -> Eel class = F

Salmon (F), Python (R), Turtle (R) -> Eel class = R

Salmon (F), Shark (F), Komodo (R) -> Eel class = F

Salmon (F), Shark (F), Python (R) -> Eel class = F

Salmon (F), Shark (F), Turtle(R) -> Eel class = F

Salmon (F), Turtle (R), Komodo (R) -> Eel class = R

Salmon (F), Turtle (R), Python (R) -> Eel class = R

Salmon (F), Turtle (R), Shark (F) -> Eel class = F