ARTIFICIAL INTELLIGENCE

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Bachelor of Business Information Technology

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CLASSIFICATION

i. KNN Algorithm
ii. Decision Trees

PROBLEM

The Problem is to classify Animals in the Zoo by using the above algorithms .We implement a simple database with boolean of 17 valued attributes .Here is a breakdown of which animals are in which type:

Class Set of animals:

```
      ====== ===================================================================
             1 (41) aardvark, antelope, bear, boar, buffalo, calf,
                    cavy, cheetah, deer, dolphin, elephant,
                    fruitbat, giraffe, girl, goat, gorilla, hamster,
                    hare, leopard, lion, lynx, mink, mole, mongoose,
                    opossum, oryx, platypus, polecat, pony,
                    porpoise, puma, pussycat, raccoon, reindeer,
                    seal, sealion, squirrel, vampire, vole, wallaby,wolf
             2 (20) chicken, crow, dove, duck, flamingo, gull, hawk,
                    kiwi, lark, ostrich, parakeet, penguin, pheasant,
                    rhea, skimmer, skua, sparrow, swan, vulture, wren
             3 (5)  pitviper, seasnake, slowworm, tortoise, tuatara
             4 (13) bass, carp, catfish, chub, dogfish, haddock,
                    herring, pike, piranha, seahorse, sole, stingray, tuna
             5 (4)  frog, frog, newt, toad
             6 (8)  flea, gnat, honeybee, housefly, ladybird, moth, termite, wasp
             7 (10) clam, crab, crayfish, lobster, octopus,
                    scorpion, seawasp, slug, starfish, worm
```

Attribute Information: (Name of attribute and type of value domain)

Animal name:	Unique for each instance
1. hair	Boolean
2. feathers	Boolean
3. eggs	Boolean
4. milk	Boolean
5. airborne	Boolean
6. aquatic	Boolean
7. predator	Boolean
8. toothed	Boolean
9. backbone	Boolean
10. breathes	Boolean
11. venomous	Boolean
12. fins	Boolean
13. legs	Numeric (set of values: {0,2,4,5,6,8})
14. tail	Boolean
15. domestic	Boolean
16. catsize	Boolean
17. type	Numeric (integer values in range [1,7])

ID3 Decition Tree has a higher accuracy of 100% while KNN has 80.65% accuracy

REGRESSION

i. ANN Algorithm

PROBLEM

The problem is to predict if it will rain the next Day.The dataset contains about 10 years of daily weather observations from different locations across Australia. Observations were drawn from numerous weather stations. There are 23 attributes including the target variable "RainTomorrow", indicating whether or not it will rain the next day or not.

Our goal is to build an artificial neural network(ANN). We will encode dates appropriately, i.e. we prefer the months and days in a cyclic continuous feature. As, date and time are inherently cyclic. To let the ANN model know that a feature is cyclic, we split it into periodic subsections. Namely, years, months and days. Now for each subsection, We create two new features, deriving a sine transform and cosine transform of the subsection feature.

Github link

(https://github.com/NickBwalley/AI-Group1-Group-Assignment2)