**Machine Learning Activity 10**

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| **Surname and initials** | **Student number** |
| **Mbuyazi MA** | **2235179** |
| **Mqokeli M** | **22321188** |
| **Sibisi MM** | **22351983** |

**For the video ,click the below link:** [**https://drive.google.com/file/d/1fPc0Y6BGg\_\_BKMvDl1tHXEB9omBJCk8p/view?usp=sharing**](https://drive.google.com/file/d/1fPc0Y6BGg__BKMvDl1tHXEB9omBJCk8p/view?usp=sharing)

**Due Date: 21 June 2024**

Analyse the sample dataset given below and answer questions that follow.

**Sample Dataset**

Color Size Texture Weight Apple

Red Small Smooth Light Yes

Green Large Rough Heavy No

Red Large Smooth Heavy Yes

Green Small Rough Light No

Red Small Rough Light Yes

Green Large Smooth Heavy No

Red Large Rough Heavy Yes

Green Small Smooth Light No

Red Small Smooth Heavy Yes

Green Large Rough Light No

* Determine whether a new object with the following features is an apple. Show all the steps that made you to arrive to the final answer:

**Color: Red**

**Size: Small**

**Texture: Rough**

**Weight: Light**

Step1:Calculate the prior probalities

P(Apple=yes)= 5/10

=0.5

P(Apple=no)= 5/10

=0.5

Step2:Calculate the likehood probabilities

Target is yes:

P(color=yes |Apple=yes)= 5/5

=1

P(size=small |Apple=yes)= 3/5

=0.6

P(texture=rough |Apple=yes)= 2/5

=0.4

P(weight=light |Apple=yes )=2/5

=0.4

Target is no:

P(color=yes |Apple=no)= 0/5

=0

P(size=small |Apple=no)= 2/5

=0.4

P(texture=rough |Apple=no)= 3/5

=0.6

P(weight=light |Apple=n0)= 3/5

=0.6

Step3:Calculate the prosterior probabilities

P(Apple=yes)= 0.5\*1\*0.6\*0.4\*0.4

=0.048

P(Apple=no)= 0.5\*0\*0.4\*0.6\*0.6\*0.6

=0

Step4:Calculate the likehood probabilities

P(Apple=yes)= P(Apple=yes)/ P(Apple=yes)+ P(Apple=no)

= 0.048/0.048+0

=0

P(Apple=no)= P(Apple=no)/ P(Apple=no)+ P(Apple=no)

= 0.048/0.048+0

=0

Step5:Calculate the likehood probabilities

P(Apple=yes)= P(Apple=yes)\*100

=1\*100

=100%

P(Apple=no)= P(Apple=no)\*100

=0\*100

=0%

Therefore the new object is an apple with 100% guaranteed