IMED Report

Brain tumor detection

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Content :

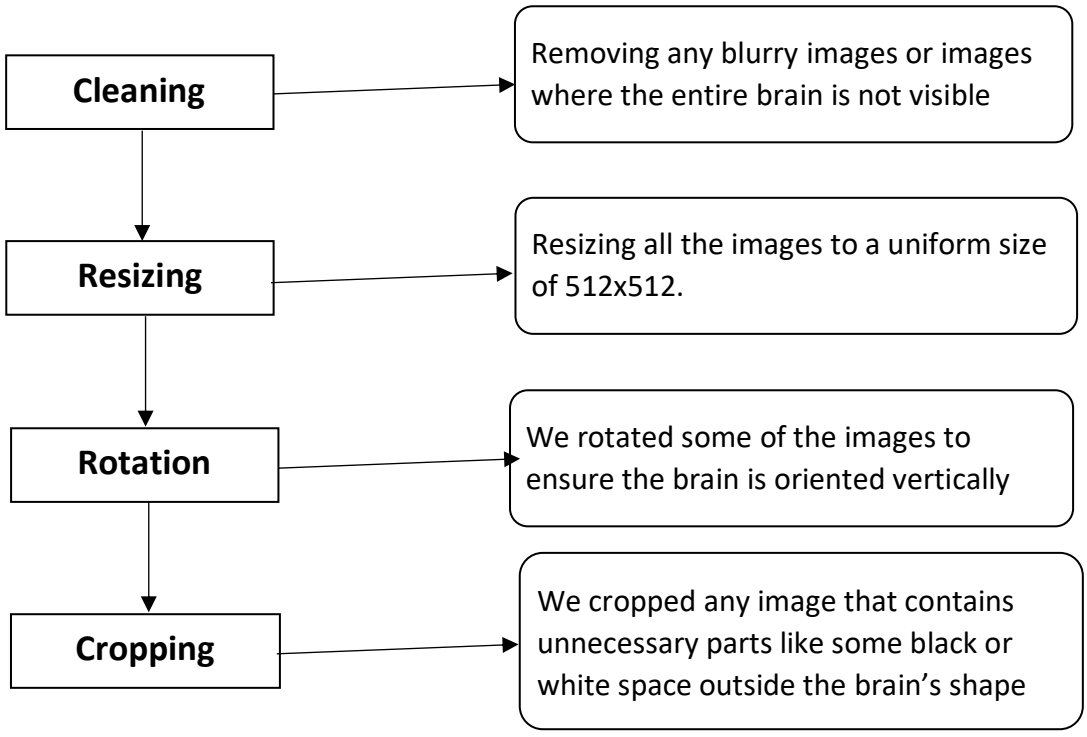
1– Dataset preparation

2– Our methodology

3– Machine learning

1– Dataset preparation :

We construct our dataset from a collection of images sourced from seven different datasets and then prepare it in these 4 steps described by this diagram :

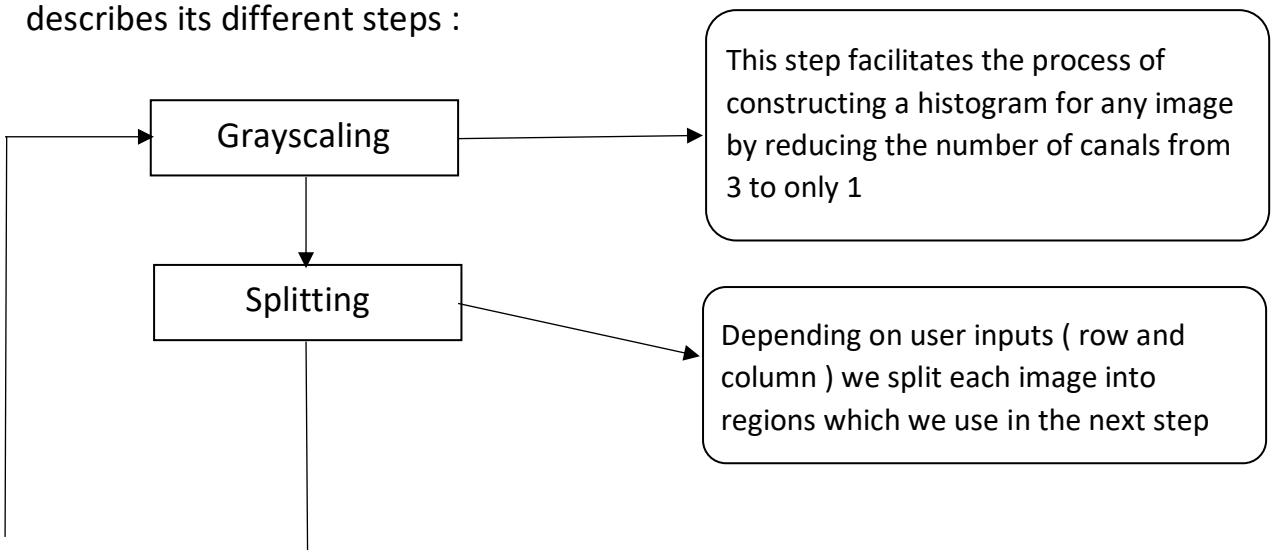


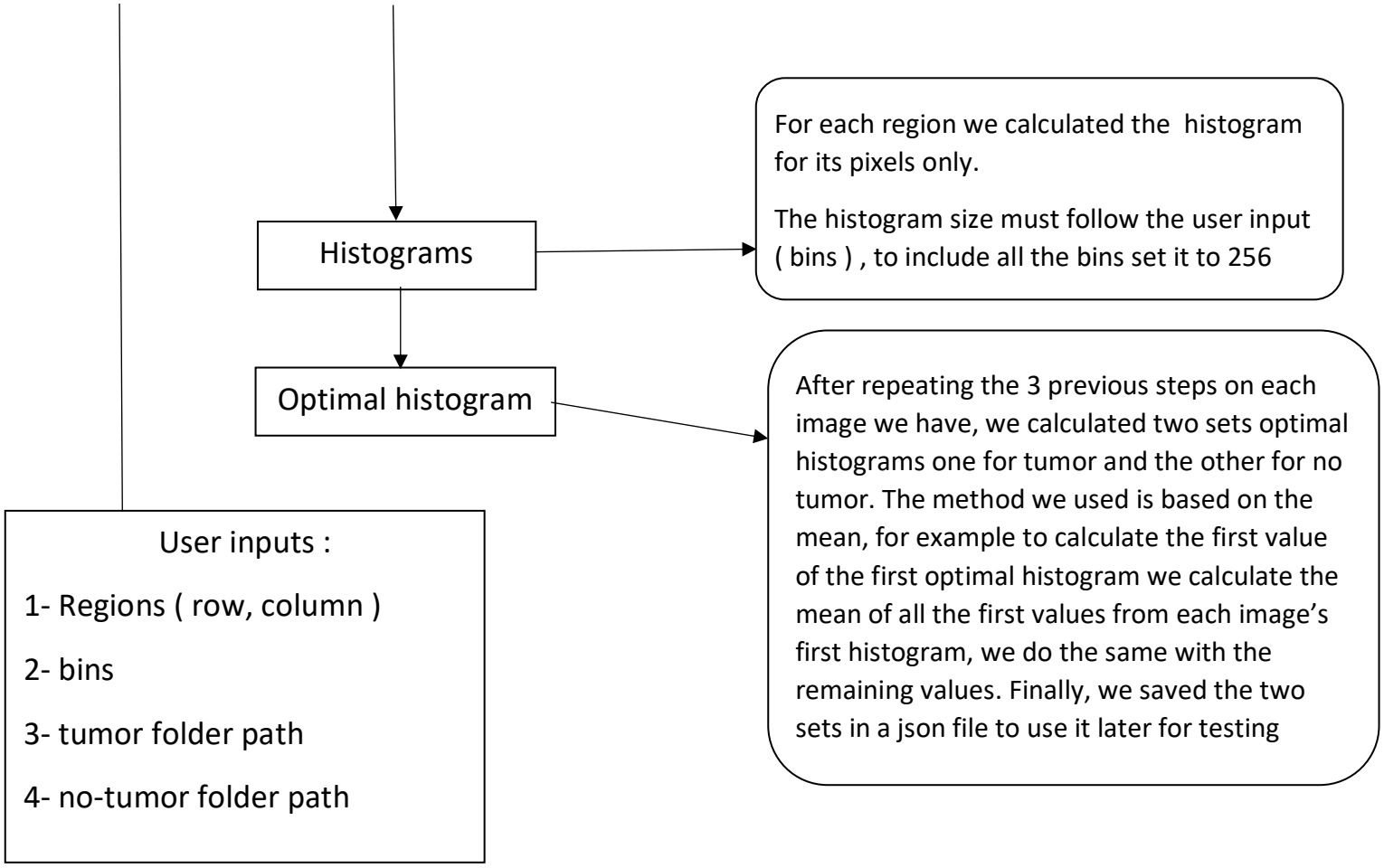
- After completing our dataset preparation, we obtained 8,423 tumor images and 3,896 no-tumor images

2– Our methodology :

2.1- Training :

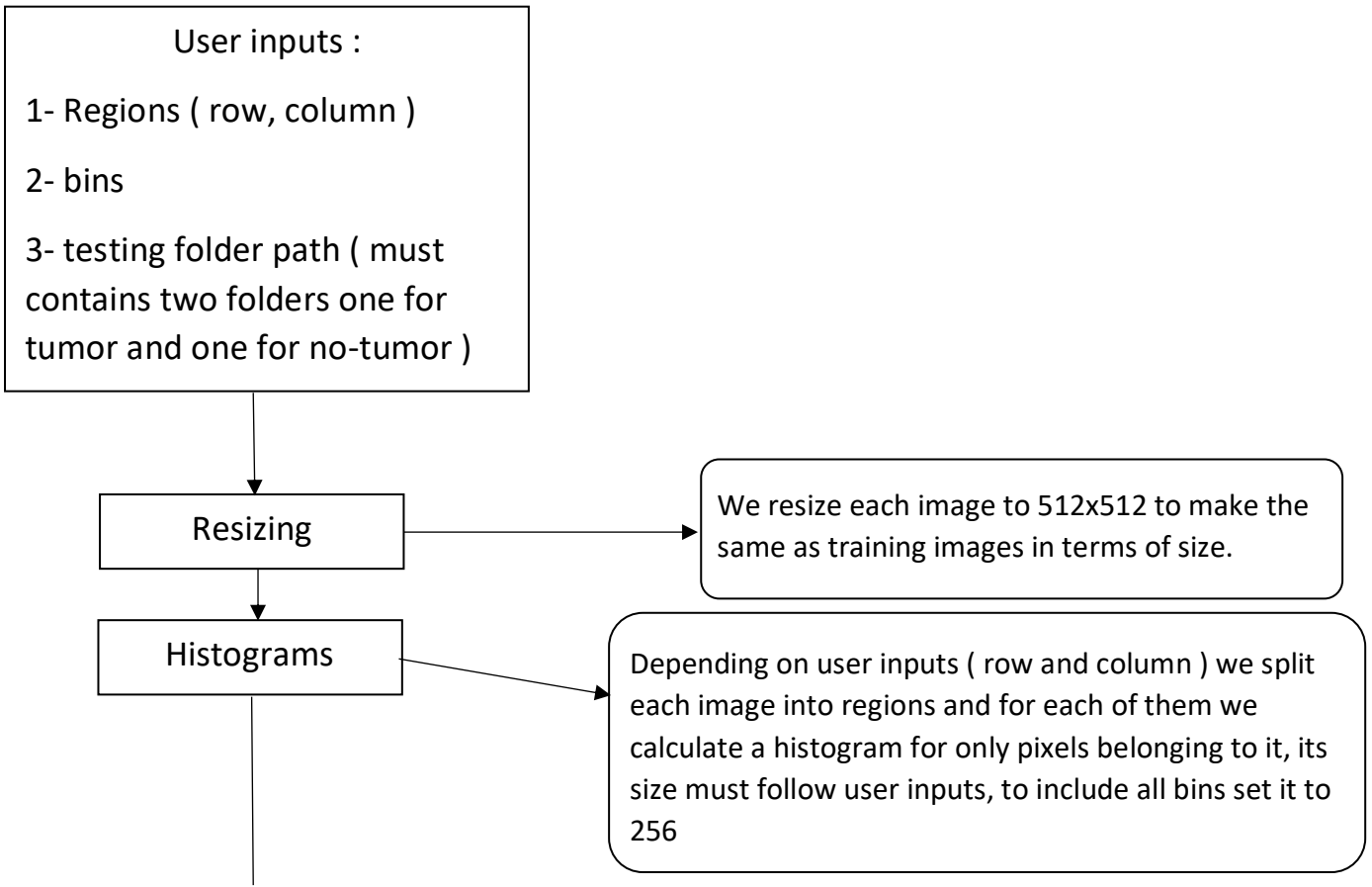
- We used a histogram based training method, the diagram below describes its different steps :

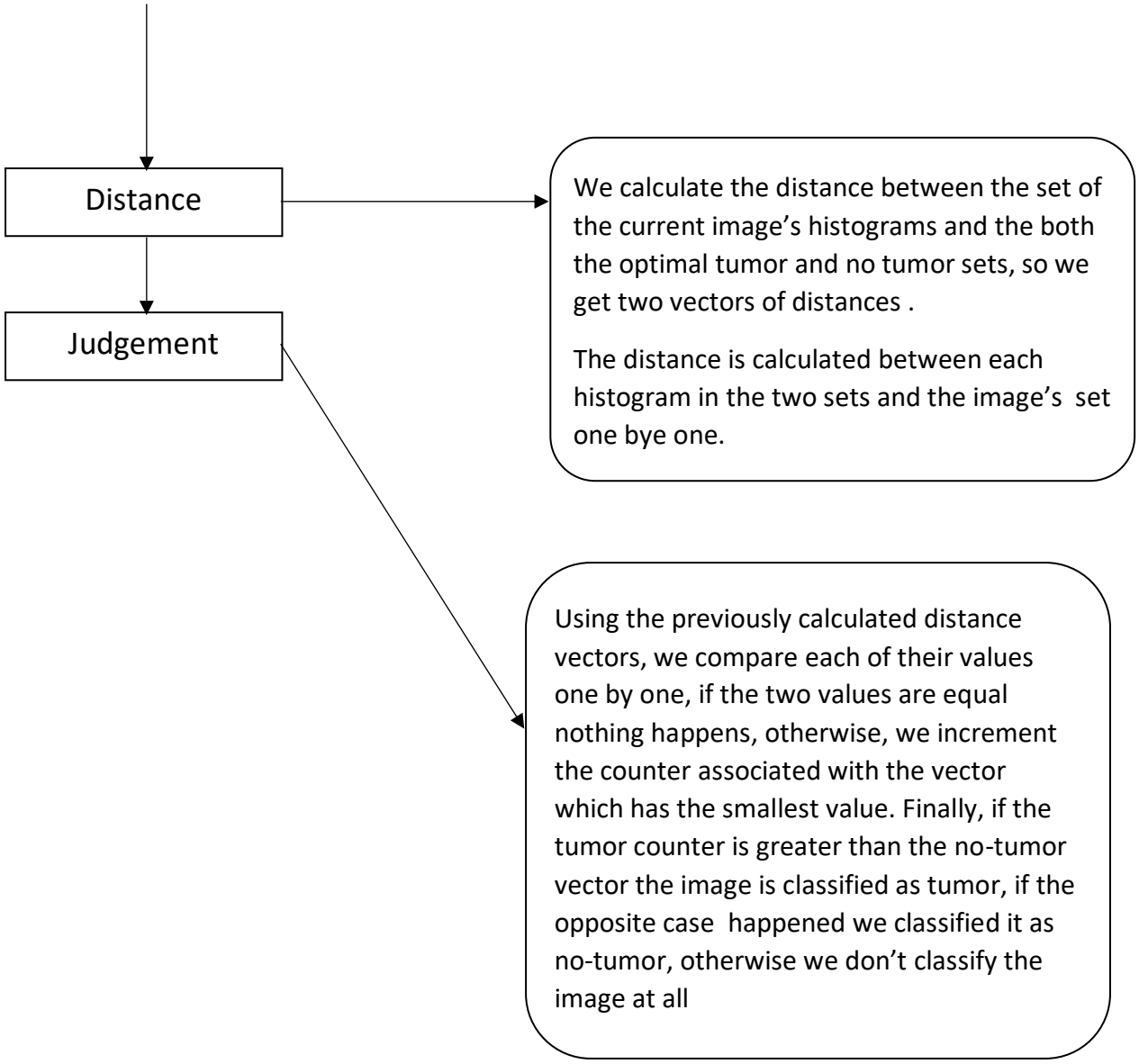




2.2- Testing:

- We used a method based on distance comparaison as described by the following diagram :





2.3- Results:

Regions count (row x column)	Accuracy
2 x 2	**71.81 %**
4 x 4	**79.64 %**
8 x 8	**69.40 %**

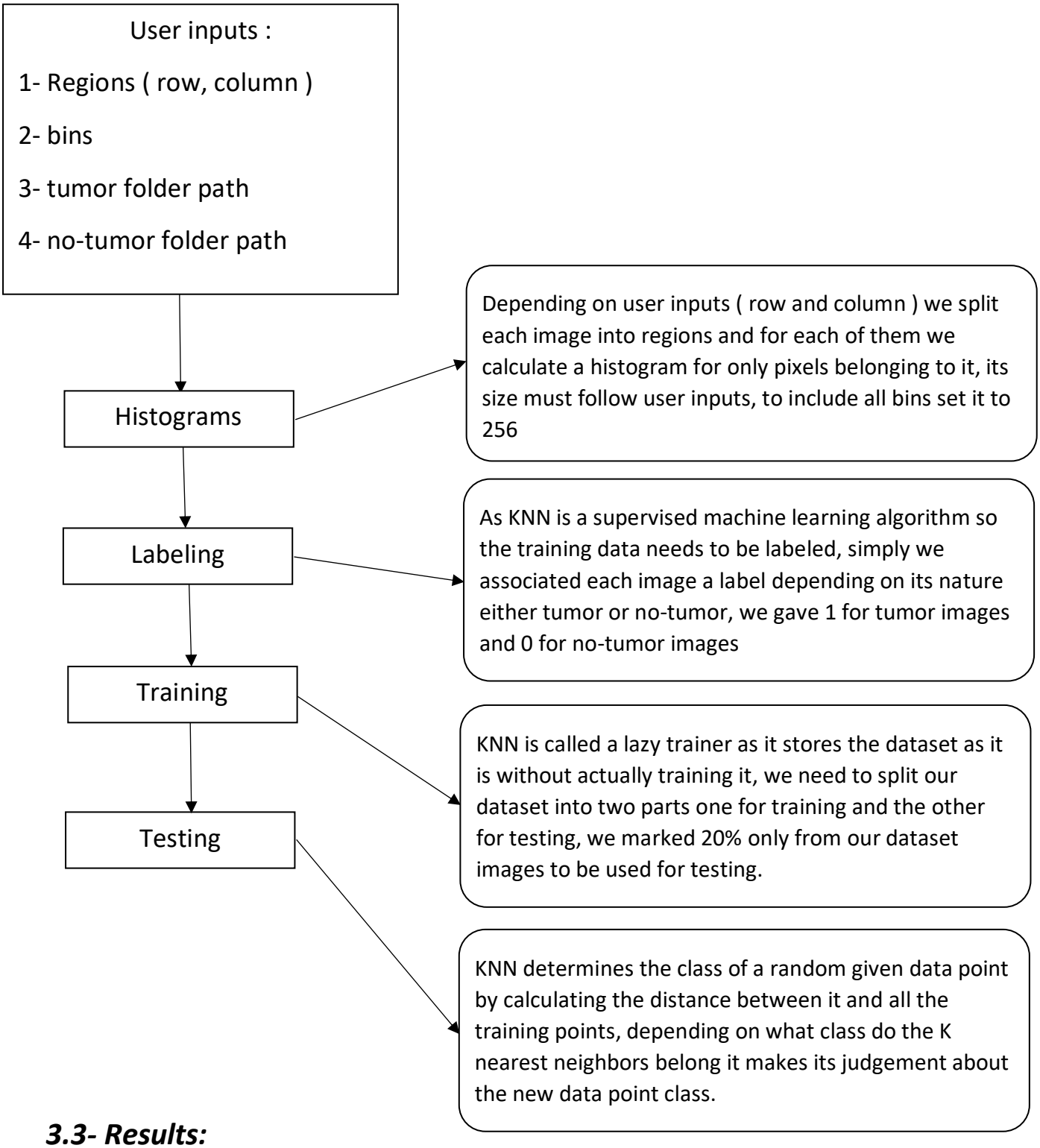
3- Machine learning :

3.1- K-Nearest Neighbors (KNN) :

- KNN is a lazy learning supervised widely used machine learning algorithm, it's based on calculating distance between the data point we want to classify and all of the other points in the dataset, it makes its judgement depending on what class do the point's k nearest neighbors belong.

3.2- KNN Steps:

- The following diagram describes the different steps used by our model :



3.3- Results:

- Using the same dataset that we used previously we get an accuracy of : 98.99%