**[Predicting Breast Cancer](https://bb.uis.edu/webapps/assignment/uploadAssignment?content_id=_599556_1&course_id=_15282_1&assign_group_id=&mode=view) Assignment**

A)  Were you successful in attempting to create a machine learning model to predict malignant tumors.

I was successful in my attempt to create a machine learning model to predict malignant tumors. After building a model, I was able to get an AUC score of 0.99.

B) The hospitals lawyers are VERY careful and are worried about the accuracy of your model.  You'll need to inform them of the risks of using your system, and possibly convince them of it's safety.

1.  How good is your model?    
Given the extremely well AUC I believe that this model is pretty good to be implemented in the hospital.

2.  How likely is it falsely predict breast cancer?  
There are very slight chances that model may falsely predict breast cancer. From the precision (0.99) we can interpret that 0.01 of the times it may falsely predict breast cancer.

3.  How likely is it to miss a malignant case?  
From the recall (99%) we can say that 1% of the times this model may miss a malignant case.

C)  The Chief Oncologist needs to be convinced that the system is making 'realistic' choices and wants to understand which variables are the most important in predicting cancer.   Explain or show the Doctor which variables are most important.

The following variables are really important in my opinion and the Chief Oncologist can review them to believe that the system is making 'realistic' choices. The three most important variables in this model were the uniformity of cell size, the uniformity of cell shape, and the bare nuclei.  
To further elaborate:

* Bare nuclei are signs of benignity. So, they have more importance in determining if a tumor is malignant or benign.
* Uniformity of the cell size / shape: Cancer cells tend to vary in size and shape. That is why these parameters are valuable in determining whether the cells are benin or malignant. Also, significantly large Epithelial cells may be malignant. Therefore, size of the cell matters.