

SQL Code for Calculating Receiver Operating Curves

```
/****** Calculate cutoff values *****/
DROP TABLE #OrderedData, #Cutoffs
SELECT Row_Number() Over(ORDER BY Predicted) as Row
, [Predicted] AS [Prob], Actual
INTO #OrderedData FROM [ROC].[dbo].[Data] order By [Predicted]

SELECT (b.[Prob]+a.Prob)/2 as Cutoff
INTO #Cutoffs
FROM #OrderedData b inner join #OrderedData a
ON a.Row = b.Row+1
INSERT INTO #Cutoffs (Cutoff) VALUES (0.0), (1.0);

-- Classify predicted scores by comparison to cutoff ----
DROP TABLE #temp1
SELECT cutoff
, CASE WHEN a.[Prob] > b.[Cutoff] THEN 1. ELSE 0. END AS Predicted
, Actual
INTO #Temp1
FROM #OrderedData a cross Join #Cutoffs b

-- Calculate sensitivity and Specificity ---
DROP TABLE #sensspec
SELECT Cutoff
, SUM(CAST(Actual AS FLOAT)*CAST(Predicted AS FLOAT))/
Sum(CAST(Actual AS FLOAT)) AS Sensitivity
, SUM((1-Predicted)*(1-Actual))/SUM(1-Actual) AS Specificity
, ROW_NUMBER() OVER(ORDER BY cutoff DESC) AS rnum
INTO #sensspec
FROM #Temp1
GROUP BY Cutoff
ORDER BY Cutoff

Select Cutoff, 1-Specificity as [1-Specificity], Sensitivity from #sensspec

-- Calculate the area of each section
DROP TABLE #Areas
SELECT CASE WHEN b.sensitivity> a.sensitivity THEN b.sensitivity ELSE
a.sensitivity END * abs(b.specificity-a.specificity)
+ Abs(b.sensitivity - a.sensitivity) * abs(b.specificity-
a.specificity)/2
AS area
INTO #areas
FROM #sensspec a inner join #sensspec b ON b.rnum-1 = a.rnum
SELECT * FROM #Areas

-- Calculate the total area under the curve
SELECT SUM (area) AS area
FROM #areas
```