**SQL Code for ROC Curve for Age**

/\*\*\*\*\*\* ROC Curve for Age \*\*\*\*\*\*/

DROP TABlE #age

SELECT [ID]

,Cast([Age] as Float)+ Cast(DayFirst as Float) /365.0 AS Age -- Age at first admission + Days later for assessment

,[Sex]

, Alive as Actual -- Dead is shown as 1

, Row\_Number()Over(ORDER BY Cast([Age] as Float)+ Cast(DayFirst as Float)/365.0) as Row

INTO #Age

FROM [Disabilities].[dbo].[Data]

Where sex='M' -- Focus on males only

ORDER BY Cast([Age] as Float)+ Cast(DayFirst as Float)/365.0

-- (1286969 row(s) affected)

-- Cutoffs set at 5 years

DROP TABlE #cutoffs

CREATE TABLE #Cutoffs (Cutoff Float);

INSERT INTO #Cutoffs (Cutoff)

VALUES (40.0), (45.0), (50.0), (55.0), (60.0), (65.0), (70.0), (75.0), (80.0), (85.0), (90.0), (95.0), (100.0);

/\*

-- Cutoffs estimated from data

DROP TABlE #cutoffs

SELECT (b.age+a.age)/2 as Cutoff

INTO #Cutoffs

FROM #Age b inner join #Age a

ON a.Row = b.Row+1

WHERE RAND(a.row)<.0001

Go

-- (129 row(s) affected)

INSERT INTO #Cutoffs (Cutoff) VALUES (0.0), (100.0);

\*/

-- Prediction based on cutoff value

DROP TABLE #temp1

SELECT cutoff

, CASE WHEN a.age > b.[Cutoff] THEN 1. ELSE 0. END AS Predicted

, a.Actual

INTO #Temp1

FROM #Age a Cross Join #Cutoffs b

-- (168,592,939 row(s) affected) 4 minutes and 45 seconds to run

-- (16,730,597 row(s) affected) 27 seconds

-- Calculating sensitvity and specificity

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

INTO #sensspec

FROM #Temp1

GROUP BY Cutoff

ORDER BY cutoff

-- (13 row(s) affected) 1 minute 16 seconds

-- Transferring data to Excel to plot

SELECT Cutoff, Sensitivity, 1.-Specificity as [1 - Specificity] FROM #sensspec

**Result**

|  |  |  |
| --- | --- | --- |
| Cutoff | 1 - Specificity | Sensitivity |
| 40 | 0.993778 | 0.998299303 |
| 45 | 0.98702 | 0.99556039 |
| 50 | 0.967246 | 0.986176892 |
| 55 | 0.917425 | 0.956602561 |
| 60 | 0.817905 | 0.887818263 |
| 65 | 0.680813 | 0.780600188 |
| 70 | 0.581431 | 0.682691452 |
| 75 | 0.469364 | 0.574524151 |
| 80 | 0.31503 | 0.415177733 |
| 85 | 0.150745 | 0.222643002 |
| 90 | 0.040249 | 0.07061848 |
| 95 | 0.005789 | 0.011682405 |
| 100 | 0.000626 | 0.001216196 |