Building a standard statistical table (z table). Area under the normal distribution to the left of
Building a standard statistical table (z table). Area under the normal distribution to the left of the Z value

From Z = 0.0 to Z = 2.99

$np := \frac{2.9}{0.1}$ np = total number of points for the column vectors

$np = 29$

$i := 0 .. np$

$X_i := i \cdot 0.1$

X = range of the first column vector

$X^T =$

	0	1	2	3	4	5	6	7	8	9
0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	...

$np2 := \frac{0.09}{0.01}$ np2 = total number of points for the row vectors

$np2 = 9$

$j := 0 .. np2$

$Y_j := j \cdot 0.01$ Y = range of the first row vector

$Y^T =$

	0	1	2	3	4	5	6	7	8	9
0	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

Formula to calculate the area to the left of the normal probability function

$$auc(Z) := \int_{-\infty}^{Z} \frac{1}{\sqrt{2 \cdot \pi}} \cdot e^{\left(\frac{-1}{2} \cdot Z^2\right)} dZ$$

examples for z scores (0, 0.2, 0.4)

$auc(0) = 0.5$ $auc(0.2) = 0.5793$ $auc(0.4) = 0.6554$

These results are consistent with the value in the attached table

Area under the curve for z= 0.45 made up by adding Xi + Yj

$X_4 = 0.4 \qquad X_5 = 0.5$

$X_4 + Y_5 = 0.45$

$\text{auc}(X_4 + Y_5) = 0.6736$ This is the area under the curve for z = 0.45

$\text{auc}(X_i + Y_j)$

$\text{auc}(X_i + Y_j) =$

0.5
0.5398
0.5793
0.6179
0.6554
0.6915
0.7257
0.758
0.7881
0.8159
0.8413
0.8643
0.8849
0.9032
0.9192
...

At this point I would like to build the table using the modified program created by Wegner by inputing X and Y as the argument for the function.

$$\text{makeTable}(a,b) := \left| \begin{array}{l} O \leftarrow \text{ORIGIN} \\ \text{for } r \in O..\text{last}(a) \\ \quad \text{for } c \in O..\text{last}(b) \\ \quad\quad \left| \begin{array}{l} T_{r,c} \leftarrow a_r + b_c \\ Z_{r,c} \leftarrow \int_{-\infty}^{T} \frac{1}{\sqrt{2\cdot\pi}} \cdot e^{\left(\frac{-1}{2}\cdot Z^2\right)} dZ \end{array} \right. \\ \text{stack}\left(\text{augment}\left("\backslash", b^T\right), \text{augment}(a, T)\right) \end{array} \right.$$

Evaluating the expression makeTable for X and Y does not lead me to the expected table. So, HELP DEBUGGING!

$\left(\text{makeTable}(X_i, Y_j) = \text{to}\right)$