AM 250, Spring 2022
Homework 2

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Applied Math

Problem 1

Q1 The correct solutions to the provided integrals are as follows:

$$\int_0^2 x^2 dx = \frac{8}{3} = 2.\bar{6}$$

$$\int_0^\pi \sin(x) dx = 2$$

Q2 The resulting integrals converge onto the true solutions as increase the number of grid points, N. This can be observed from the following table:

N	$\int \sin x$	$\int x^2$
2	1.5708	3.00
3	1.8138	2.8148
5	1.9337	2.7200
10	1.9835	2.6799
100	1.9998	2.6668

Problem 2 The original 5x5 input random ones array was as follows:

$$\begin{bmatrix} 0 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 1 & 1 \end{bmatrix}$$

The resulting array after the implementation of the ones algorithm is:

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 1 \\ 1 & 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$