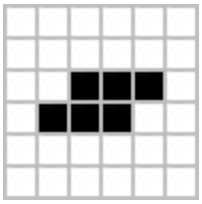
Coding assignments:

Submit the code by 11:59 pm on 19th July 2020

Q1. 

Taking this as the initial grid for Conway's game of Life, show the evolution of the grid with time. You may assume the exterior neighbours of all boundary points are "dead" or 0. The design generated is called "Toad".

Q2. Animate the graph of the curve y = (x-5)(cos x) between the x limits 0 and 10.

By 'animate', we mean starting from the point (x=0, y = -5) the points should be plotted sequentially till the whole graph is drawn.

Take y limits as +10 and -10.

Q3. Bonus Question: Langton's ant: (Optional)
The ant starts out on a random grid containing dark/black (0) and light/white (1) cells, and then follows the following set of rules:

1. If the ant is on a black square, it turns right and moves forward one unit.
2. If the ant is on a white square, it turns left and moves forward one unit.
3. When the ant leaves a square, it inverts the color.

Make a 7*7 grid where you simulate the motion of Langton's ant. (python notebook)

The **output** should be an animated matrix, similar to the example code for Conway's Game of Life. You do not need to "show an ant". The evolution of the grid is sufficient. You will need to store the ants position in a way that you can use it again.

Hint 1: Use np.random.randint(2, size=(n, n))) to create the random grid of numbers where n is the dimensionality of the grid.
Hint 2: You only need to change the animate function in the Game of Life code.
Hint 3: (Is this getting too easy?) To get a random initial point for the ant use:
indices = np.random.randint(0, high=max_index, size=2)

Use boundary conditions such that the board wraps around itself (top and bottom row are joined and leftmost and rightmost columns are joined). The ant is essentially living on a toroid!