Create a Google Colab Notebook and save it as YourLastName\_Project2.ipnyb.

1. Create a mini-casino with 15 slot machines whose such that the rewards are distributed as follows:

Machine\_1: Normal distribution with mean 0.25 and standard dev. 1

Machine\_2: Uniform distribution supported between -0.75 and 0.25.

Machine\_3: Triangular distribution supported between -0.25 and 0.75, and the vertex projection splits the base 40%-60%.

Machine\_4 - Machine\_10: Beta distribution supported between -0.5 and 1 + 1.5\*sin(machine\_number), with 𝛽 = 2.3, and 𝛼=1.8

Machine\_11 Triangular distribution supported between -0.5 and 2.5, and the vertex projection splits the base 6.25% - 93.75%.

Machine\_12 - Machine\_15 Uniform distribution supported between -0.4 and 0.6+0.25\*cos(machine\_number).

Which one seems to be the “lucky” machine? (Hint: consider a violin plot)

2. Assume it costs 2$ to play each game and you have 200$. Implement the Upper Confidence Bound Algorithm and show that it detects the “lucky” machine.

3. Given the same assumptions as before, implement the epsilon-greedy method with epsilon = 0.2. What do you notice in this case when you apply this method multiple times compared to using the UCB algorithm?

3. Consider the grocery store data introduced in class. Apply the "apriori" algorithm to determine what are the association rules between two items if we are looking overall at items that sold at least 200 times. Use a min lift of 3, and a min support and confidence of 0.5%. How many rules did you find?