UNIVERSITY OF KASDI MERBAH, OUARGLA
DEPARTMENT OF COMPUTER SCIENCE AND IT
MODULE : STATISTICS FOR DATA SCIENCE

LAB1 : Common probability distributions & distribution approximations

1 Probability Distributions

You have seen throughout the course common probability distributions which form the foundation of the probability and statistics theory. This lab will be focused on exploring four key distributions namely *Binomial*, *Exponential*, *Poisson* and *Normal*.

2 Required Work

For each of the previously mentioned distributions, write a class with the following functions:

- PDF or PMF using your own function and visualize it using **plt.hist()** or **plt.bar()**, and **sns.kdeplot()**.
- Sampling function **sample()** which returns a sample of size 50, 100 and 1000 respectively and visualize each sample. What did you notice?

We want to approximate the *Binomial* distribution by the *Poisson* and the *Gaussian* on one hand and the *Poisson* by the *Gaussian* on the other hand.

- Write a function to check whether the approximation is possible and calculates the new parameters.
- Superimpose the graphs of the original distribution and its approximation and compare them.

3 Insructions

- Use ***numpy*** arrays instead of python lists.
- Do not use ***numpy*** pre-implemented functions.
- Any confirmed copied answer results in a zero.