Central Limit Theorem Demo

This project demonstrates the principles of the Central Limit Theorem by sampling a given input distribution 1000 times with a user specified sample size.

Requirements

If plotting is enabled, Matplotlib and Seaborn are required.

Usage

The `central_limit_theorem_demo.py` file contains a `CentralLimitTheorem` class. It can be instantiated with a distribution in the form of a list.

```
import central_limit_theorem_demo as clt

some_distribution = create_distribution(...)
cltDemo = clt.CentralLimitTheorem(some_distribution)
```

The demo can be run via the `run_sample_demo` method on CentralLimitTheoremDemo. This method takes a sample size `N`, a plotting flag `plot`, and an optional `num_bins` parameter describing the number of bins to use when plotting the demo output.

Example

A full example might look something like this.

```
import central_limit_theorem_demo as clt

def create_uniform_sample_distribution():
    return range(100)

def run():
    sampleDistribution = create_uniform_sample_distribution()

    # Plot the original population distribution
    clt.plot_distribution(sampleDistribution, "Population Distribution",
0, 100, 20)

    # Plot a sampling distribution for values of N = 2, 3, 10, and 30
    cltDemo = clt.CentralLimitTheoremDemo(sampleDistribution)
    n_vals = [2, 3, 10, 30]
    for N in n_vals:
        cltDemo.run_sample_demo(N = N, plot = True, num_bins = 40)
```

This produces the following output images.


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