

AI1110 : Probability And Random Variables

Software Report

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Abstract—In this assignment we made a Music Player in python which uses numpy module of python to shuffle and play the songs.

FUNCTIONALITY OVERVIEW:

1) Song Shuffling:

The program shuffles the songs in the specified directory, ensuring a unique and random playlist every time.

2) Playback Control:

The user interface provides easy-to-use controls. The "Play" button plays the next song in the shuffled list, while the "Pause" and "Resume" buttons allow for convenient playback control.

3) Reshuffling:

The "Reshuffle" button reorders the entire song list, enabling a fresh playlist. This feature prevents repetition.

4) Previous Song Playback:

With the "Previous" button, I can replay the previously played song.

NUMPY.RANDOM.SHUFFLE:

The `np.random.shuffle` function in NumPy is used to randomly permute or shuffle the elements of an array in place. In terms of probability, `np.random.shuffle` can be seen as a process that generates a random permutation of the elements in the array, where each possible permutation is equally likely.

Let's consider an array with N elements. When you apply `np.random.shuffle` to this array, it randomly reorders the elements, creating a new permutation. The number of possible permutations of N elements is $N!$, which is the factorial of N . Each

of these permutations has an equal probability of being generated.

In our case we have 20 songs so we have $20!$ ways to permute the array of 20 songs each and each permutation will get a uniform probability of getting selected of $\frac{1}{20!}$.

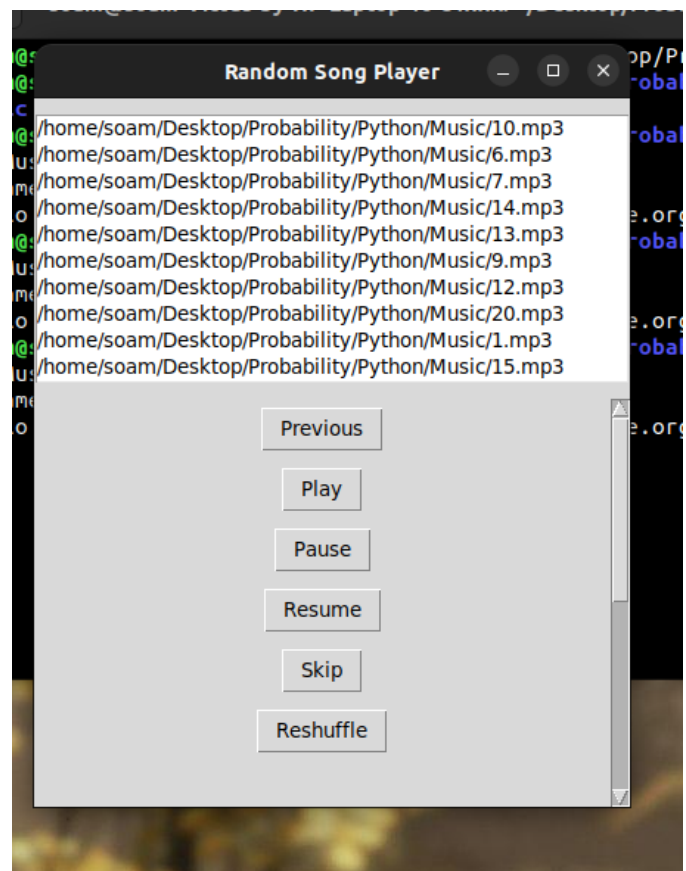


Fig. 4. UI of the Random Music Generator