Lab 1 Numpy Basics

NumPy Practice Lab

1. **Creating Arrays**
   - Create a 1D NumPy array named `arr1` with the elements 2, 4, 6, 8, and 10.
   - Create a 2D NumPy array named `arr2` with two rows: [1, 3, 5] and [7, 9, 11].
2. **Array Operations**
   - Add 5 to each element of `arr1`.
   - Multiply each element of `arr2` by 3.
3. **Array Attributes**
   - Print the dimensions (`ndim`), shape, and size of `arr2`.
   - Print the data type (`dtype`) of `arr1`.
4. **Slicing and Indexing**
   - Extract the first two elements of `arr1`.
   - Extract the second row of `arr2`.
5. **Fancy Indexing**
   - Select the elements at index positions 1 and 3 of `arr1`.
6. **Broadcasting and Mathematical Functions**
   - Add 3 to every element in `arr1`.
   - Find the square root of each element in `arr1`.
   - Apply the sine function to each element in `arr1`.
7. **Stacking and Concatenation**
   - Vertically stack `arr1` and another array `arr3` with values [12, 14, 16, 18, 20].
   - Concatenate `arr2` along axis 1 with a new array `arr4` containing two columns [13, 15] and [17, 19].

8. **Masking and Boolean Indexing**
    - Create a boolean mask for `arr1` that selects elements greater than 6.
    - Use the mask to select the elements from `arr1`.
9. **Reshaping and Transposing**
    - Reshape `arr1` into a 2D array with shape (5, 1).
    - Transpose the `arr2` array.