Assignment 8 (Programming)

For the hiring problem with n candidates, you can always use an array of ranks to denote the candidates, e.g., if n=4, array {3,2,4,1} means you would hire the first candidates (rank 3), the second candidate (rank 2, better than rank 3) and the last candidate (rank 1).

Use four methods to estimate the expected number of hires in hiring problem that contains n candidates.

1. Output $\sum_{i=1}^{n} \frac{1}{i}$;

2. Generate 10,000 random arrays of ranks, check the number of hires for each random array, and output the average;

3. Enumerate all the $n!$ permutations of the arrays of ranks, check the number of hires for each array in the set of $n!$ permutations, and output the average;

4. Output $Ln\ n$.

Compare the results you get from method 1, 2, 3 and 4 for n=8,10,12 in terms of number of hires and the running time.

If n=50, can your program give the result using methods 1, 2, and 4? What about using method 3?