1. Starting with the code in ThreeOfaKind.m create a new mfile named Flush_LastName.m that computes the probability of a flush. A flush is 5 cards of the same suit. Compute the analytic probability. Look up the probability on Wikipedia. Compare the three values.

Added Algorithm

```
% Calculate the number of cards for each suit
kSut = kHnd(:,4);
nSut = zeros(4, 1);
for iSut = 1:4; % For each suit
    fSut = (kSut==iSut);
    nSut(iSut) = sum(fSut);
end

% Decide if this is a flush
nSutSort = sortrows(nSut, -1);     % Sort the suit from highest to
if nSutSort(1) == 5                    % For flush there must be a
    Flush = Flush + 1 ;
    fprintf('%2d %1d    ', kHnd(:, 3:4)'); fprintf('\n');
end
```

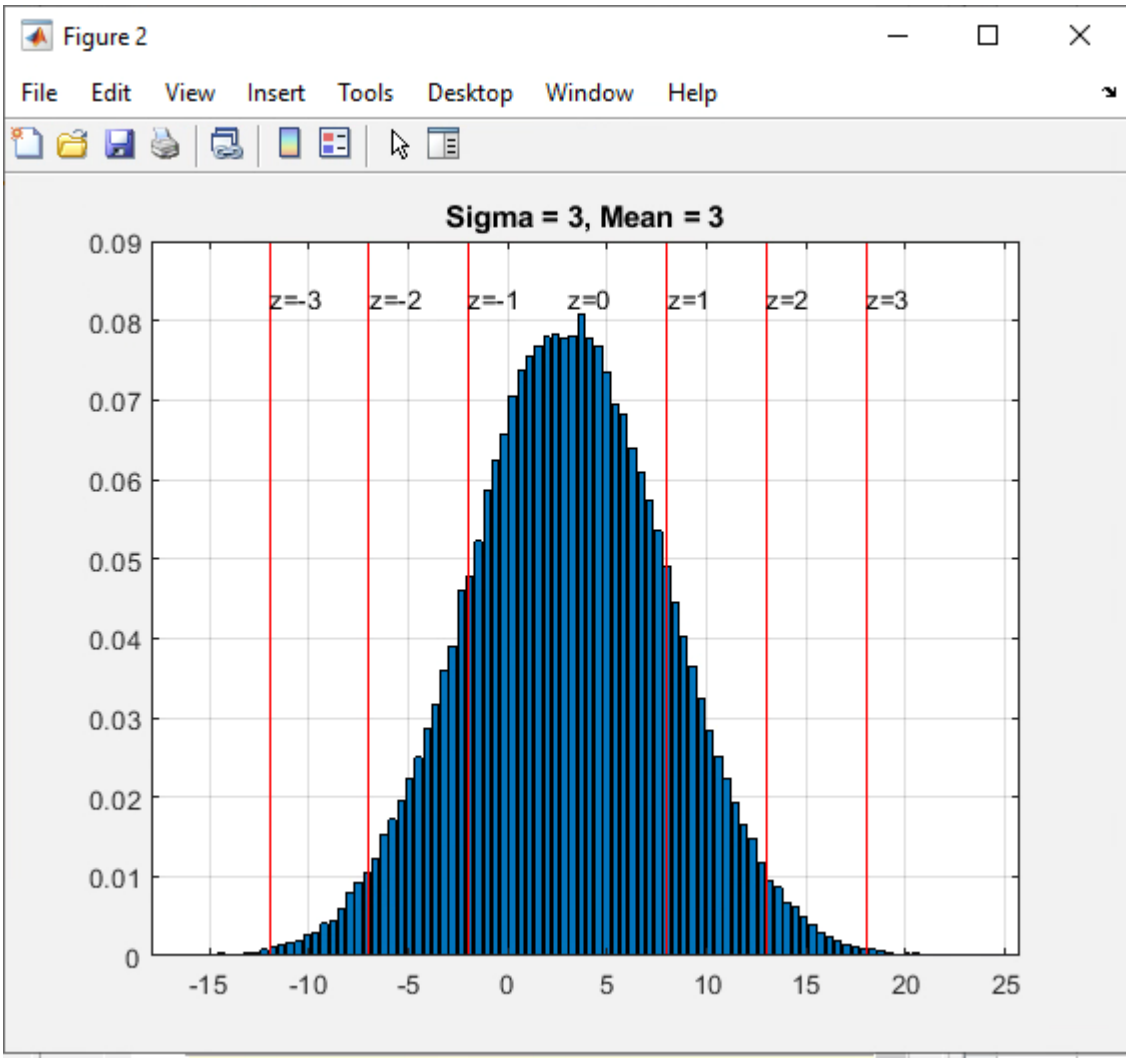
Results

```
Three of a kind ---> Num Prb: 0.02000000, True Prb: 0.02112845
Flush ---> Num Prb: 0.00200000, True Prb: 0.00196540
>>
```

2. Starting with the code in Histograms.m generate the following plot. Use 100,000 random normal numbers with a standard deviation of 5 and a mean of three. Plot red vertical lines for sigma=-3:3, and label the z scores as shown. Call this mfile DistributionHomework_LastName.m.

See submitted code for added algorithm

Results



3. 3. Compute the Bit Error Rate (BER) for a communications channel where a zero has a mean of -5, and a sigma of 3, and a one has a mean of 5 and a sigma of 3. The probability of a one is 50%. Compute the BER using a simulation of 100,000 ones, and 100,000 zeros. Plot the PDFs. Call you Matlab script BitErrorRateHomework_LastName.m. Compute the BER analytically using normcdf, erf, or erfc. Your plot should look like this:

Work