
Table of Contents

| | |
|------------------------------------|---|
| | 1 |
| Inputs, Variables, Constants | 1 |
| Interactive Inputs | 1 |
| Main Code | 1 |
| Results | 2 |

```
clc;
clear all;
close all;
```

Inputs, Variables, Constants

```
alphabets = ["X", "Y", "Z"];
probabs = [0.2 0.5 0.3];
MESSAGE = 'XYXZ';
```

Interactive Inputs

```
%alphabets = input("Enter alphabets array in ascending order: ");
%probabs = input("Enter respectively probability array: ");
%MESSAGE = input("Enter message: ");
```

Main Code

```
cumProbs = [0 cumsum(probabs)];

low = 0;
high = 1;

fprintf('Initial range: [%.6f , %.6f]\n\n', low, high);

for k = 1:length(MESSAGE)
    idx = find(alphabets == MESSAGE(k));

    % Current range width
    range = high - low;

    % Calculate new boundaries CORRECTLY
    low_new = low + range * cumProbs(idx);
    high_new = low + range * (cumProbs(idx) + probabs(idx));

    % Update for next iteration
    low = low_new;
    high = high_new;

    fprintf('After %c : [%.6f , %.6f]\n', MESSAGE(k), low, high);
end
```

Initial range: [0.000000 , 1.000000)

After X : [0.000000 , 0.200000)

After Y : [0.040000 , 0.140000)

After Y : [0.060000 , 0.110000)

After X : [0.060000 , 0.070000)

After Z : [0.067000 , 0.070000)

Results

```
fprintf('\nEncoded range for the message "%s" is: [%f , %f)\n',  
        MESSAGE, low, high);  
res = (low + high) / 2;  
fprintf('Assigned average value for the message is: %f\n', res);
```

Encoded range for the message "XYXZ" is: [0.067000 , 0.070000)

Assigned average value for the message is: 0.068500

Published with MATLAB® R2021a