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## 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 = 'XYYZ';
```

## 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 "XYYXZ" is: [0.067000 , 0.070000)
Assigned average value for the message is: 0.068500
```

*Published with MATLAB® R2021a*