```
clc; clear; close all;

message = 'ACBBA';

symbols = ['A', 'B', 'C'];
probabilities = [0.5, 0.3, 0.2];

% Encode the message
[low, high] = arithmetic_encode(message, symbols, probabilities);
encoded_value = (low + high) / 2;
disp(['Encoded Value: ', num2str(encoded_value)]);
```

```
Encoded Value: 0.46725
```

```
% Decode the message
decoded_message = arithmetic_decode(encoded_value, length(message), symbols, probabilities);
disp(['Decoded Message: ', decoded_message]);
```

```
Decoded Message: ACBBA
```

```
% Verify correctness
if strcmp(message, decoded_message)
    disp('Arithmetic encoding and decoding successful!');
else
    disp('Error in Arithmetic Coding implementation.');
end
```

```
Arithmetic encoding and decoding successful!
```