```matlab
% Shannon Fano Coding by Pritish Deshmukh
clear all;
close all;
clc;
sym = {'0-30', '31-59', '60-63', '64-100', ...
'101-127', '128-150', '151-200', '201-255'};
freq = [2048, 2048, 2048, 2048, 819, 819, 3277, ...
3277];
prob = freq / sum(freq);
[prob, idx] = sort(prob, 'descend');
sym = sym(idx);
codes = cell(size(sym));
lens = zeros(size(sym));
stack = {{sym, prob, ''}};
while ~isempty(stack)
    d = stack{end};
    stack(end) = [];

    s = d{1}; p = d{2}; pre = d{3};
    if length(s) == 1
        idx = strcmp(sym, s{1});
        codes{idx} = pre;
        lens(idx) = length(pre);
        continue;
    end
    split = find(cumsum(p) >= sum(p) / 2, 1);
    stack{end+1} = {s(1:split), p(1:split), [pre ...
'0']};
    stack{end+1} = {s(split+1:end), ...
p(split+1:end), [pre '1']};
end
```
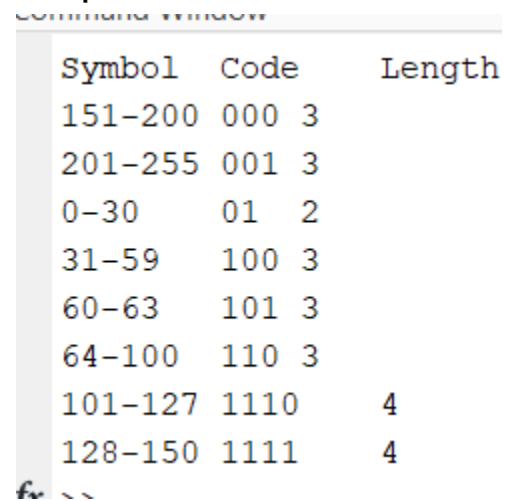
```matlab
fprintf('Symbol\tCode\tLength\n');
for i = 1:length(sym)
    fprintf('%s\t%s\t%d\n', sym{i}, codes{i},
lens(i));
end
```

Input–

```matlab
sym = {'0-30', '31-59', '60-63', '64-100', '101-127', '128-150', '151-200',
'201-255'};
freq = [2048, 2048, 2048, 2048, 819, 819, 3277, 3277];
```

Output—

Symbol	Code	Length
151-200	000	3
201-255	001	3
0-30	01	2
31-59	100	3
60-63	101	3
64-100	110	3
101-127	1110	4
128-150	1111	4