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Electrical Machine Design(EE3706)

```
W= input('window_windth :');
 d= input('Core_diameter :');
 a= input('a :');
 b= input('b :');
 c= input('c :');
 lv=input('low_Voltage_thickness :');
 hv=input('high_Voltage_thickness :');

function center_rectangle(x, y, h, w, color, fill)
   if fill
      rectangle('Position', [x - w/2, y - h/2, w, h], 'FaceColor', color, 'EdgeColor', color);
   else
      rectangle('Position', [x - w/2, y - h/2, w, h], 'EdgeColor', color, 'FaceColor', 'none');
   end
end

function yoke_top_view(length, thickness)
   center_rectangle(0, 0, thickness, length, 'b', false);
end

function limbs_top_view_2step(d, a, b,c)
   center_rectangle(-d/2, 0, a, c, 'c', true);
   center_rectangle(-d/2, 0, b, b, 'c', true);
   center_rectangle(-d/2, 0, c, a, 'c', true);
   center_rectangle(d/2, 0, a, c, 'c', true);
```

```
    center_rectangle(d/2, 0, b, b, 'c', true);
    center_rectangle(d/2, 0, c, a, 'c', true);
end



function concentric_circle(d, dia, t, color)
    theta = linspace(0, 2 * pi, 500);
    for offset = [-d/2, d/2]
        x_outer = offset + (dia/2 + t) * cos(theta);
        y_outer = (dia/2 + t) * sin(theta);
        x_inner = offset + (dia/2) * cos(theta);
        y_inner = (dia/2) * sin(theta);
        patch([x_inner, fliplr(x_outer)], [y_inner, fliplr(y_outer)], color, 'EdgeColor', 'none',
'FaceAlpha', 0.3);
    end
end




function winding_design(innerdia, d, lv, hv)
    % Insulation
    concentric_circle(d, innerdia, 2.5, 'b');
    innerdia = innerdia + 2.5 * 2;
    % LV winding
    concentric_circle(d, innerdia, lv, 'g');
    innerdia = innerdia + lv * 2;
    % Insulation
    concentric_circle(d, innerdia, 11, 'b');
    innerdia = innerdia + 11 * 2;
```

```
    % HV winding
    concentric_circle(d, innerdia, hv, 'r');
    innerdia = innerdia + hv * 2;
    % insulation
    concentric_circle(d, innerdia, 11, 'b');
    innerdia = innerdia + 11 * 2;
end



figure;
% yoke top view
yoke_top_view(W+2*(d+lv+hv+25), d+2*(hv+lv+25));
% Limbs top view
limbs_top_view_2step(d+W, a, b,c); % enter D, a, b ,c values
% Winding design
winding_design(d, d+W, lv, hv);%enter d,D, thickness of lv wdg, thickness of hv wdg


axis([-600 600 -600 600]);
axis equal;
grid on;
```