***i) DETERMINING SUITABLE VALUES OF D AND L***

**CODE:**

clc;

% Given data P\_in = 75000;

eff = 0.91;

P\_out = eff \* P\_in; N = 840;

p = 4;

si = 0.7;

n = N / 60;

% Given arrays

D\_arr = [0.1 0.2 0.3 0.4 0.5 0.6]; % Diameter (m)

Bav\_ac\_arr = [5200 9300 12700 15500 18000 20000]; % Bav \* ac

% Pre-allocate array for lengths L\_arr = zeros(1, length(D\_arr));

fprintf(' D (m) Bav\*ac (W/m^3) L (m)\n'); fprintf(' \n');

for i = 1:length(D\_arr) D = D\_arr(i);

Bav\_ac = Bav\_ac\_arr(i);

% Calculate L from power formula L = P\_out / (pi^2\*D^2\*n\*Bav\_ac);

% Store the length in the array L\_arr(i) = L;

fprintf(' %.3f %3d %.3f\n', D, Bav\_ac, L); end

fprintf('\nAll calculated T values:\n'); fprintf(' D (m) L (m) T\n'); fprintf(' \n');

min\_diff = inf; closest\_index = -1; for i = 1:length(D\_arr)

D = D\_arr(i); L = L\_arr(i);

% Calculate T

T = (L \* p) / (0.7 \* pi \* D);

fprintf(' %.3f %.3f %.3f\n', D, L, T);

% Find T closest to 1 diff = abs(T - 1);

if diff < min\_diff min\_diff = diff; closest\_index = i;

end end

% Print closest values

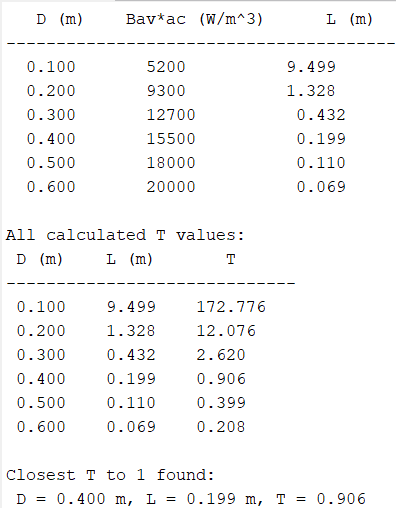
D\_closest = D\_arr(closest\_index); L\_closest = L\_arr(closest\_index) ;

T\_closest = (L\_closest \* p) / (0.7 \* pi \* D\_closest);

fprintf('\nClosest T to 1 found:\n');

fprintf(' D = %.3f m, L = %.3f m, T = %.3f\n', D\_closest, L\_closest, T\_closest);

**OUTPUT:**

****