CODICE OMEGA

```matlab
omega = ones(100, 1);
marginefase = ones(100, 1);

for w = 1 : 40
    cost = 0;

    while true
    cost = cost + 0.1;
    num = [1/((w)*10^(-cost)), 1];
    den = [1/((w)*10^(cost)), 1];
    R2 = tf(num, den);

    for mu=1:20

        R1 = tf(mu, 1);
        R = series(R1, R2);
        L2 = series(R, G);
        F = feedback(L2, 1);
        ys = r_fin*step(F, t);
        y_inf = r_fin*ones(size(t));
        Info = lsiminfo(ys, t);
        Ta_reale = Info.SettlingTime;
        S_reale = (Info.Max-r_fin)/r_fin;

        if (Ta_reale<Ta && S_reale<S && allmargin(L2).PhaseMargin>60)
            break
        end
    end
    if (Ta_reale<Ta && S_reale<S && allmargin(L2).PhaseMargin>60)
            break
    end
end
 omega(w, 1) = cost;
 marginefase(w, 1) = allmargin(L2).PhaseMargin;

end

[min_cost, w_omega] = min(omega);
[max_fase, w_fase] = max(marginefase);
```