SCTC and OCTC Methods

Developed in the mid-1960's at MIT. Procedure is as follows:

1) DISABLE all independent sources... (voltage sources → SHORT CIRCUIT, current sources → OPEN CIRCUIT); DO NOT remove or "disable" dependent sources!

2) Identity capacitors as **Open Circuit** or **Short Circuit** = higher or lower cut-off respectively

(OCTC) ⇩ higher cut-off

3) Keep **Short Circuit caps SHORT**
They are irrelevant to the **OCTC**.

4) Keep **Open Circuit caps OPEN**
Each **open circuit** C_i contributes to the **OCTC**.
Determine the resistance R_i seen by C_i

5) Higher cut-off frequency is estimated as:

$$\omega_{H-3dB} \approx \frac{1}{\sum_i C_i R_i} = \frac{1}{C_1 R_1 + C_2 R_2 + \cdots}$$

(SCTC) ⇩ lower cut-off

3) Keep **Open Circuit caps OPEN**
They are irrelevant to the **SCTC**.

4) Keep **Short Circuit caps SHORT**
Each **short circuit** C_i contributes to the **SCTC**.
Determine the resistance R_i seen by C_i

5) Lower cut-off frequency is estimated as:

$$\omega_{L-3dB} \approx \sum_i \frac{1}{C_i R_i} = \frac{1}{C_1 R_1} + \frac{1}{C_2 R_2} + \cdots$$