Approach:-

Room-setup $\longrightarrow t_{ij}$ $\longrightarrow$ [Direct-comp. Paper] $\longrightarrow$ Initial estimates (a), (b)

True values $\longrightarrow$ (b) $\longrightarrow$ [Algorithm-2] $\longrightarrow$ Final estimates.

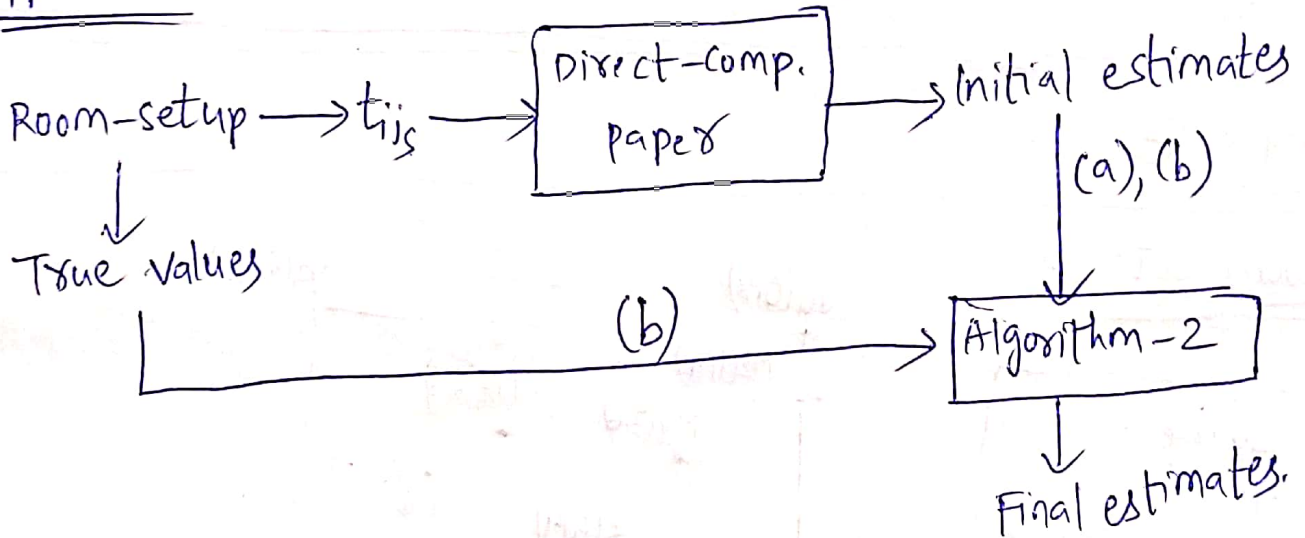
Note:- In algorithm 2,

i) (a) $\rightarrow$ Case (a) : Setting the shaded regions to initial estimates

ii) (b) $\rightarrow$ Case (b) : Setting the shaded regions to True values.
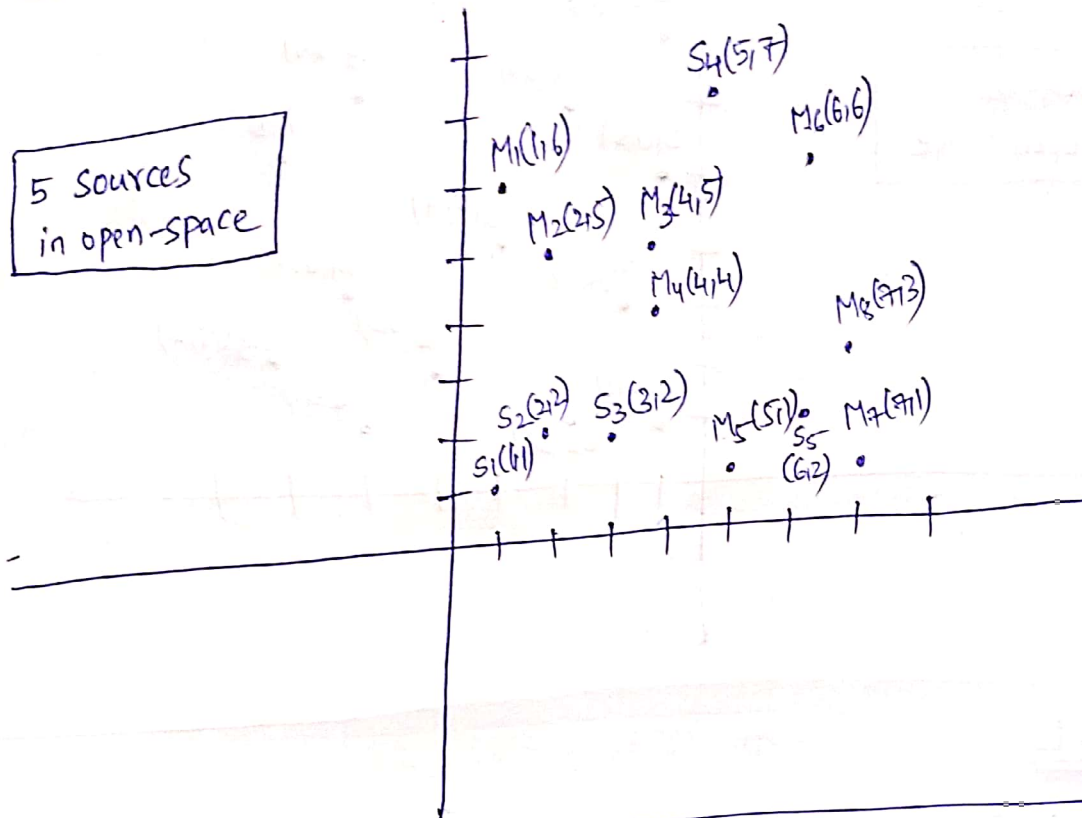

Formulas:-

i) Intermediate rel. error $= \dfrac{\left\| \text{True EDM} - \substack{\text{EDM after direct-comp} \\ \text{Paper (Initial estimates)}} \right\|_F}{\|\text{True EDM}\|_F}$

ii) Final rel. error $= \dfrac{\left\| \text{True EDM} - \substack{\text{EDM after Algorithm 2} \\ \text{(Final estimates)}} \right\|_F}{\|\text{True EDM}\|_F}$

Example ①:-

i) Source, Mic. Configuration:-

5 sources in open-space

Source and microphone configuration plot:
- $S_4(5,7)$
- $M_6(6,6)$
- $M_1(1,6)$
- $M_2(2,5)$ $M_3(4,5)$
- $M_4(4,4)$
- $M_8(7,3)$
- $S_2(2,2)$ $S_3(3,2)$ $M_5(5,1)$ S_5 $M_7(7,1)$
- $S_1(1,1)$ $(6,2)$

ii) Results:-

a)

Shaded Regions	Intermediate Rel. error	Final Rel. error
mic – mic	0.6819	0.6819
sour – mic	0.6819	0.6819
sour – sour	0.6819	0.6819

Script 1

b)

Shaded Regions	Intermediate Rel. error	Final Rel. error
mic – mic	0.6819	0.5137
sour – mic	0.6819	0.1883
mic – mic	0.6819	0.6819

Script 2

Example ②:

i) Source, Mic configuration:-

5 Sources in open space

M₂(17)
M₄(3,6)
M₇(6,6)
M₈(7,5)
S₁(1,5)
S₃(4,4)
S₄(6,3)
M₃(2,3)
M₅(5,2)
S₅(7,2)
M₆(6,1)
M₁(1,1)
S₂(3,1)
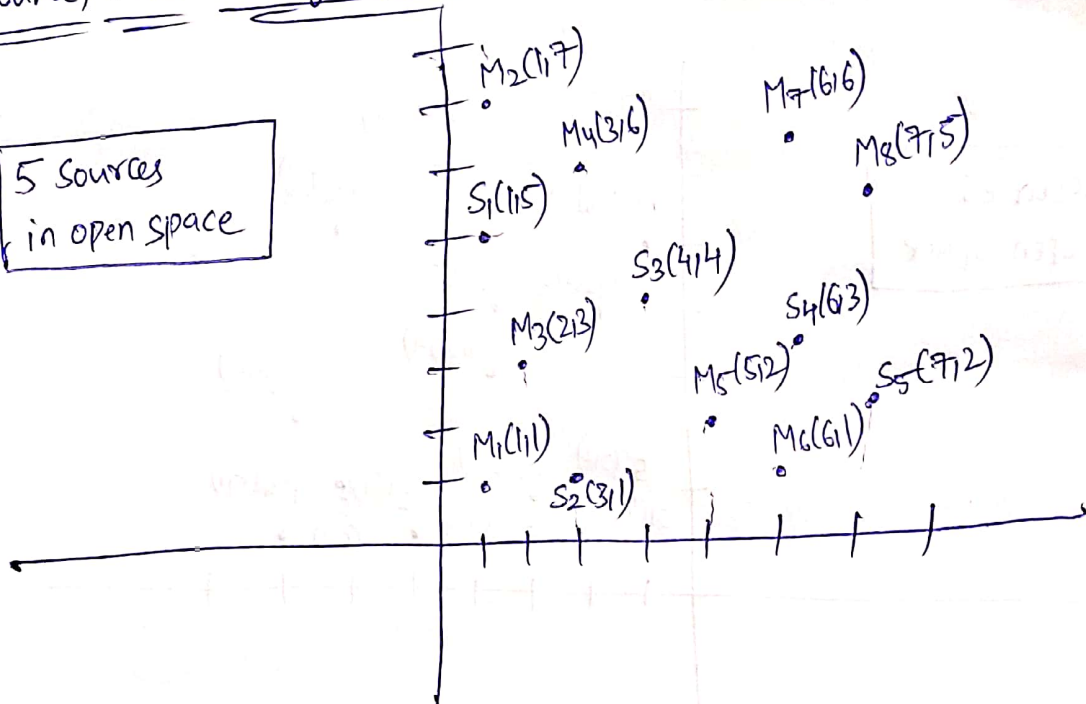
ii) Results:-

a)

Shaded Regions	Intermediate Rel. error	Final Rel. error
mic-mic	0.8125	0.8125
Sour-mic	0.8125	0.8125
Sour-Sour	0.8125	0.8125

script 3

b)

Shaded Regions	Intermediate Rel. error	Final Rel. error
mic-mic	0.8125	0.7109
Sour-mic	0.8125	0.0638
Sour-Sour	0.8125	0.8125

script 4

Conclusion :—

- For example ① & ②,

  → Case (a) : Setting the shaded Regions to initial estimate

  i, All the cases (mic-mic, sour-mic, sour-sour)
  doesn't have any improvement in results compared
  to initial estimates, i.e., Algorithm ② has no use/
  nothing to do with, here.

  → Case (b) : Setting the shaded Regions to True values.

  i, In mic-mic case, Algorithm ② is ~~worsening~~ improving the
  initial estimates, little bit.

  ii) In sour-mic case, Algorithm ② is converging to True
  values, i.e, good result'

iii) In sour-sour case, Algorithm ② is not accounting for a significant change, i.e, almost it doesn't have any use here.