Exercise I: K-Mean

User K-means algorithm and Euclidean distance for clustering these 9 record into **3 clusters**.

A1=(3,8), A2=(9,4), A3=(4,9), A4=(2,2), A5=(10,5), A6=(2,4), A7=(6,8), A8=(4,3), A9=(4,7).

Given the distance between any 2 records using Euclidean distance measurement in the matrix below.

	A1	A2	A3	A4	A5	A6	A7	A8	A9
A1	0	$\sqrt{52}$	$\sqrt{2}$	$\sqrt{37}$	$\sqrt{58}$	$\sqrt{17}$	$\sqrt{9}$	$\sqrt{26}$	$\sqrt{2}$
A2		0	$\sqrt{50}$	$\sqrt{53}$	$\sqrt{2}$	$\sqrt{49}$	$\sqrt{25}$	$\sqrt{26}$	$\sqrt{34}$
A3			0	$\sqrt{53}$	$\sqrt{52}$	$\sqrt{29}$	$\sqrt{5}$	$\sqrt{36}$	$\sqrt{4}$
A4				0	$\sqrt{73}$	$\sqrt{4}$	$\sqrt{52}$	$\sqrt{5}$	$\sqrt{29}$
A5					0	$\sqrt{65}$	$\sqrt{25}$	$\sqrt{40}$	$\sqrt{40}$
A6						0	$\sqrt{32}$	$\sqrt{5}$	$\sqrt{13}$
A7							0	$\sqrt{29}$	$\sqrt{5}$
A8								0	$\sqrt{16}$
A9									0

Instruction Given the initial seeds to be A1, A4, A7. Run step-by-step K-means algorithm. For each iteration, show these information.

a) Members of each cluster

b) Centroid of each cluster

c) Graph representing clusters d their members

How many iterations have to be run until K-Mean converges? Show the centroid and members of each cluster after K-Mean converges.