V.N. Anirudh Orugati

CSCE 350: HOME WORK #5

1.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	W	X	Y	Z	_
4	6	6	6	1	6	3	6	6	6	6	6	5	2	6	6	6	6	6	6	6	6	6	6	6

Keyword: MAGNET

MICHAEL_FARADAY_WAS_LED_TO_THE_CONCEPT_OF_ELECTROMAGNETIC_INDUCTION_BY_CHANGING_MAGNETIC_FIELDS.

MAGNET shift=1
MAGNET shift=6
MAGNET shift=6
MAGNET shift=1
MAGNET shift=6
MAGNET shift=6
MAGNET shift=6
MAGNET shift=1
MAGNET shift=6
MAGNET shift=5
MAGNET ← Found Match

2.

$$R = \begin{bmatrix} 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 \\ 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 \end{bmatrix} \quad R^{(0)} = \begin{bmatrix} 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 \\ 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 \end{bmatrix} \quad R^{(1)} = \begin{bmatrix} 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 \\ 1 & 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 \end{bmatrix}$$

$$R^{(2)} = \begin{bmatrix} 0 & 1 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 1 \\ 1 & 1 & 1 & 0 & 1 \end{bmatrix} \quad R^{(3)} = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 1 \\ 1 & 1 & 1 & 1 & 1 \end{bmatrix} \quad R^{(4)} = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 1 \\ 1 & 1 & 1 & 1 & 1 \end{bmatrix}$$

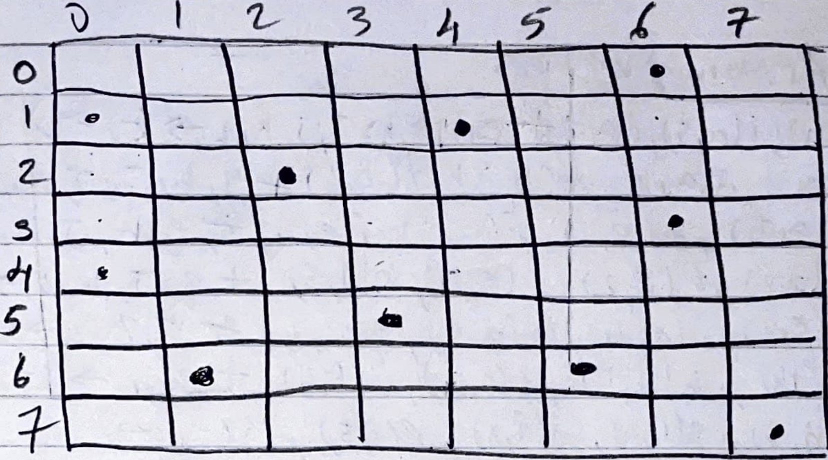
$$R^{(5)} = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \end{bmatrix} = T$$

3.

$$D^{(0)} = \begin{bmatrix} 0 & 2 & \infty & 1 & 8 \\ 5 & 0 & 3 & 2 & \infty \\ \infty & \infty & 0 & 4 & \infty \\ \infty & \infty & 2 & 0 & 3 \\ 3 & \infty & \infty & \infty & 0 \end{bmatrix} \quad D^{(1)} = \begin{bmatrix} 0 & 2 & \infty & 1 & 8 \\ 5 & 0 & 3 & 2 & 13 \\ \infty & \infty & 0 & 4 & \infty \\ \infty & \infty & 2 & 0 & 3 \\ 3 & 5 & \infty & 4 & 0 \end{bmatrix} \quad D^{(2)} = \begin{bmatrix} 0 & 2 & 5 & 1 & 8 \\ 5 & 0 & 3 & 2 & 13 \\ \infty & \infty & 0 & 4 & \infty \\ \infty & \infty & 2 & 0 & 3 \\ 3 & 5 & 8 & 4 & 0 \end{bmatrix}$$

$$D^{(3)} = \begin{bmatrix} 0 & 2 & 5 & 1 & 8 \\ 5 & 0 & 3 & 2 & 13 \\ \infty & \infty & 0 & 4 & \infty \\ \infty & \infty & 2 & 0 & 3 \\ 3 & 5 & 8 & 4 & 0 \end{bmatrix} \quad D^{(4)} = \begin{bmatrix} 0 & 2 & 3 & 1 & 4 \\ 5 & 0 & 3 & 2 & 5 \\ \infty & \infty & 0 & 4 & 7 \\ \infty & \infty & 2 & 0 & 3 \\ 3 & 5 & 6 & 4 & 0 \end{bmatrix} \quad D^{(5)} = \begin{bmatrix} 0 & 2 & 3 & 1 & 4 \\ 5 & 0 & 3 & 2 & 5 \\ 10 & 12 & 0 & 4 & 7 \\ 6 & 8 & 2 & 0 & 3 \\ 3 & 5 & 6 & 4 & 0 \end{bmatrix} = D$$

4.



	0	1	2	3	4	5	6	7
0	0	0	0	0	0	0	1	1
1	1	1	1	1	2	2	2	2
2	1	1	2	2	2	2	2	2
3	1	1	2	2	2	2	3	3
4	2	2	2	2	2	2	3	3
5	2	2	2	3	3	3	3	3
6	2	3	3	3	3	4	4	4
7	2	3	3	3	3	4	4	5

optimal path

5

Tree vertices	Remaining vertices
a(-,-)	b(a,3), c(a,5), d(a,4) + e, f, g, h, I, J, K, L → (-,∞)
b(a,3)	c(a,5), d(a,4), e(b,3), f(b,6) + g, h, I, J, K, L → (-,∞)
e(b,3)	c(a,5), d(e,1), f(e,2), i(e,4) +, g, h, J, K, L → (-,∞)
d(e,1)	c(d,2), f(e,2), i(e,4), h(d,5) + g, J, K, L → (-,∞)
c(d,2)	f(e,2), i(e,4), h(d,5), g(c,4) + J, K, L → (-,∞)
f(e,2)	i(e,4), h(d,5), g(c,4), j(f,5) + K, L → (-,∞)
i(e,4)	h(d,5), g(c,4), j(i,3), l(i,5), K(-,∞)
j(i,3)	h(d,5), g(c,4), l(i,5), K(-,∞)
g(c,4)	h(g,3), l(i,5), k(g,6),
h(g,3)	l(i,5), k(g,6)
l(i,5)	K(g,6)
k(g,6)	

Minimum Spanning Tree.