Homework 5

● Graded

Student

Giancarlos Marte

Total Points

99 / 103 pts

Question 1

Huffman's Algorithm

21 / 22 pts

- **– 0 pts** Correct
- **– 22 pts** Not answered
- **– 7 pts** a not answered
- **– 5 pts** b not answered/completely wrong
- **– 5 pts** c not answered
- **– 5 pts** d not answered
- **– 5 pts** wrong trie
- **– 2 pts** wrong coding
- ✔ **– 1 pt** d not complete/incorrect
- **– 2 pts** c not complete

Question 2

Fixed-length binary codes

6 / 8 pts

- **– 0 pts** Correct
- ✔ **– 2 pts** not minimal/wrong order
- **– 3 pts** not complete/wrong
- **– 8 pts** not answered

Question 3

Adjacency lists for an undirected Graph

5 / 5 pts

- ✔ **– 0 pts** Correct
- **– 1 pt** incorrect item
- **– 5 pts** not answered

Question 4

DFS of an undirected Graph

10 / 10 pts

✔ **– 0 pts** Correct

– 2 pts not complete/ incorrect

– 10 pts not answered/ unreadable

– 4 pts not complete

Question 5

BFS of an undirected Graph

5 / 5 pts

✔ **– 0 pts** Correct

– 2 pts not complete/incorrect

– 5 pts not answered

– 3 pts not complete/incorrect

Question 6

Adjacency lists for a directed Graph

5 / 5 pts

✔ **– 0 pts** Correct

– 1 pt incorrect item

– 3 pts incorrect items

– 5 pts not answered

Question 7

App scemario: word letter substitutions

15 / 16 pts

– 0 pts Correct

– 2 pts a not correct

– 2 pts b not correct

– 2 pts d not correct/incomplete

✔ **– 1 pt** not correct

– 16 pts not answered

Question 8

App scenario: prerequisites

16 / 16 pts

✔ **– 0 pts** Correct

– 2 pts b not correct

– 16 pts not answered

– 4 pts d not answered

– 4 pts a not answered

Question 9

App scenario: Kevin Bacon game

16 / 16 pts

✔ **– 0 pts** Correct

– 16 pts not answered

– 2 pts b not correct

– 4 pts b not answered

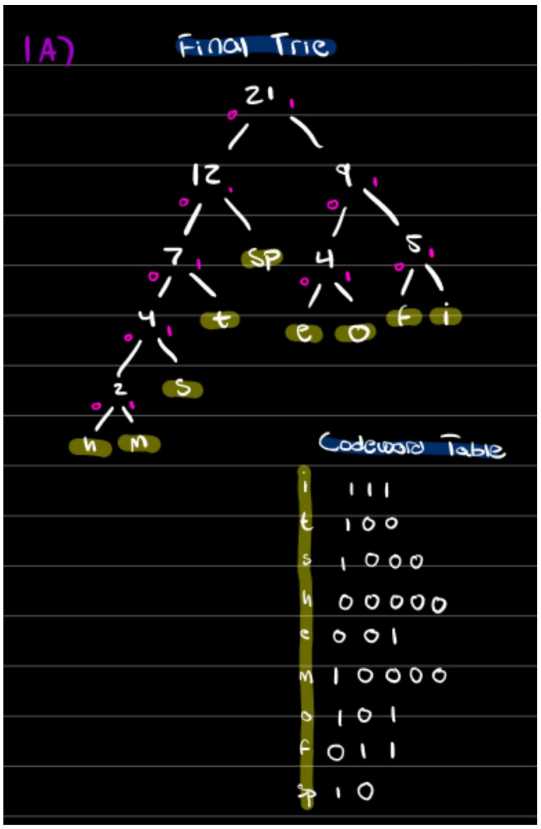
– 4 pts c not answered

– 4 pts d not answered

Question assigned to the following page: 1

Giancarlos Marte
hw5 (cs310)
5/4/21

1. **Huffman's Algorithm**



1B)

111	100	10	111	1000	10	100	00000	001	10	100	111	10000	001	10	101	011	10	011	101	101	1000			
i	t	sp	i	s	sp	t	h	e	sp	t	i	m	e	sp	o	f	sp	f	o	o	s			

Question assigned to the following page: 1

1C)

In order to decode you have to go through the tree, following the 1's & 0's (from the compressed bitstring) until you get to the character

111 100 10 ...

1D)

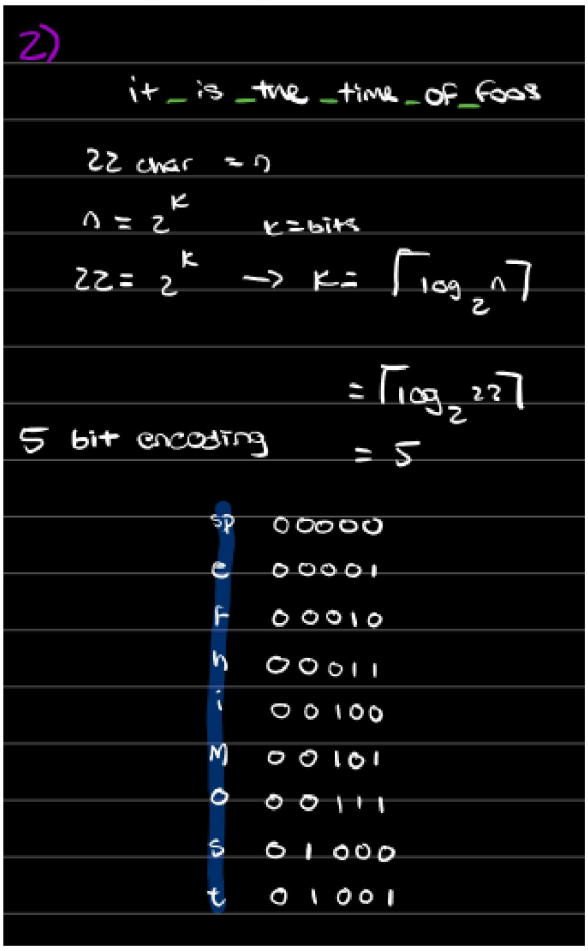
h	m	s	e	o	f	i	t	sp
1	1	2	2	2	2	3	3	5

h 00000 least freq

sp 10 most freq

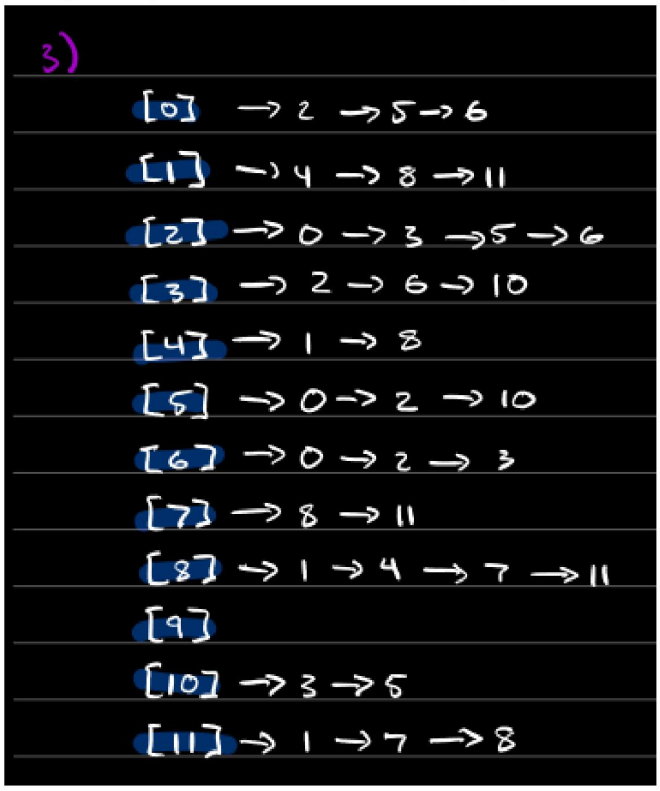
Question assigned to the following page: 2

2. **Fixed-length binary codes**



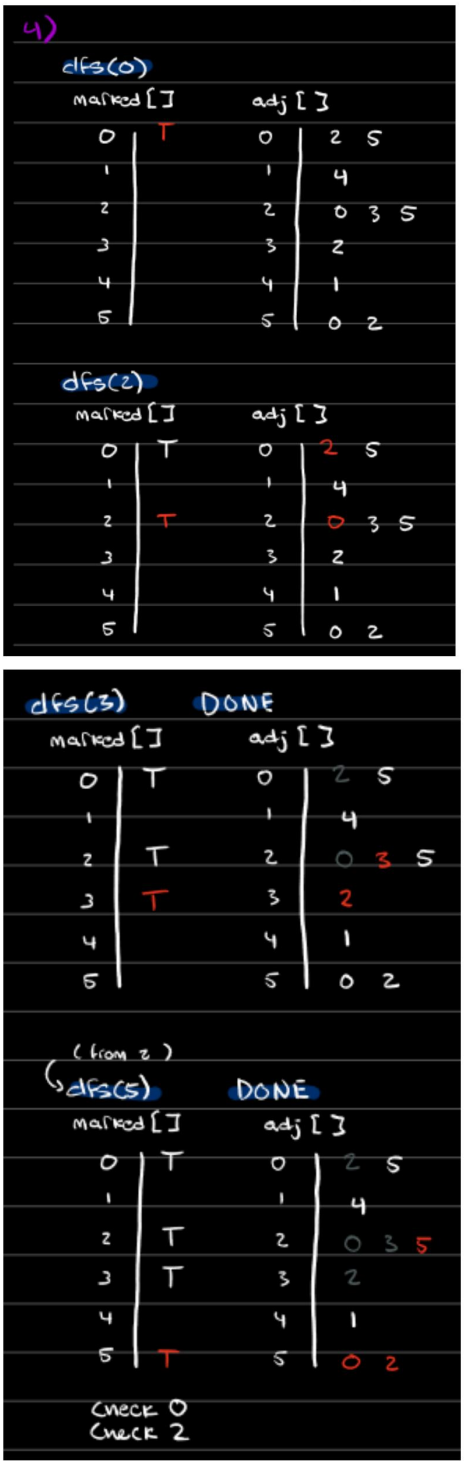
Question assigned to the following page: 3

3. **Adjacency lists for an undirected graph**

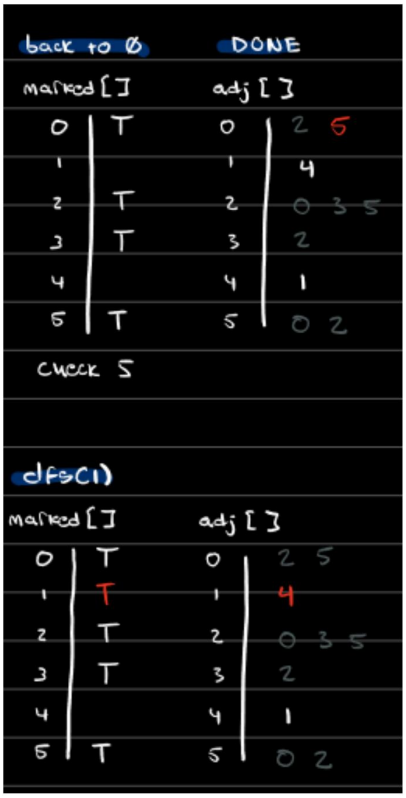


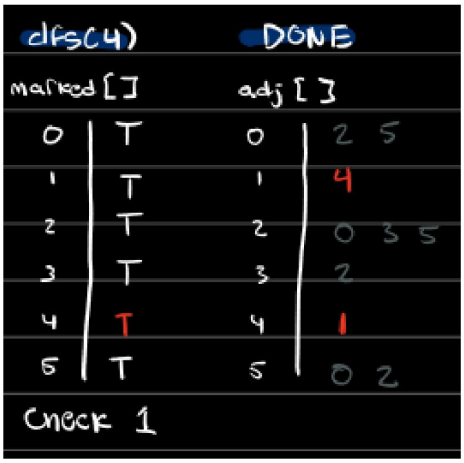
Question assigned to the following page: 4

4. **DFS of an undirected Graph**



Question assigned to the following page: 4



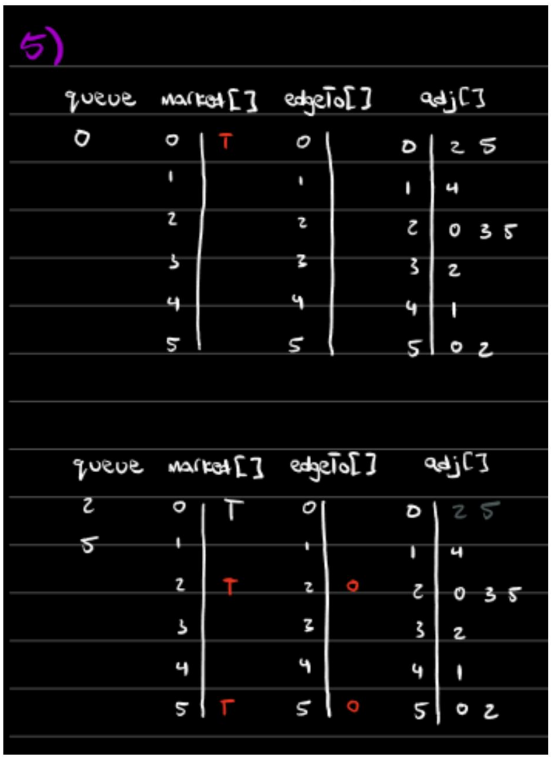


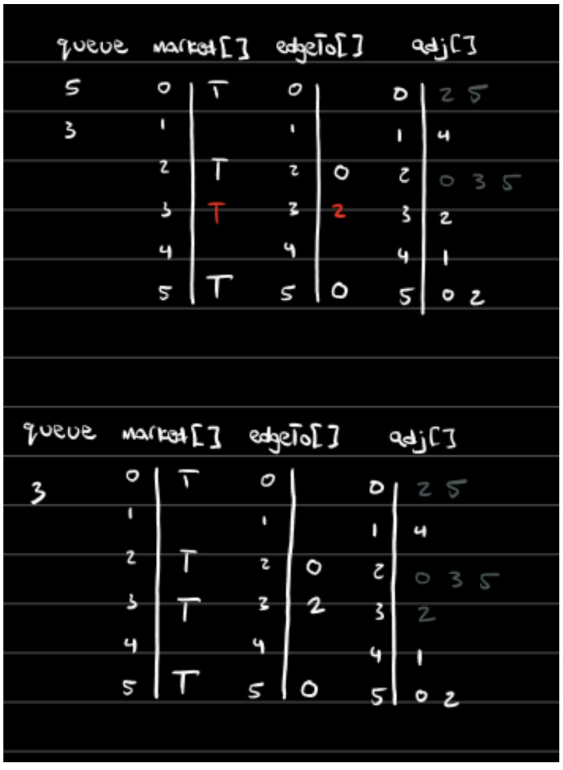
edgeTo[ ]

0	|
1	|
2	| 0
3	| 2
4	| 1
5	| 2

Question assigned to the following page: 5

5. **BFS of an undirected Graph**



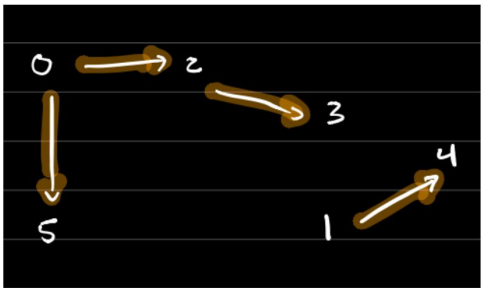


Question assigned to the following page: 5

queue		marked[]		edgeTo[]		adj[]	
	0	T	0		0	2 5	
	1		1		1	4	
	2	T	2	0	2	0 3 5	
	3	T	3	2	3	2	
	4		4		4	1	
	5	T	5	0	5	0 2	

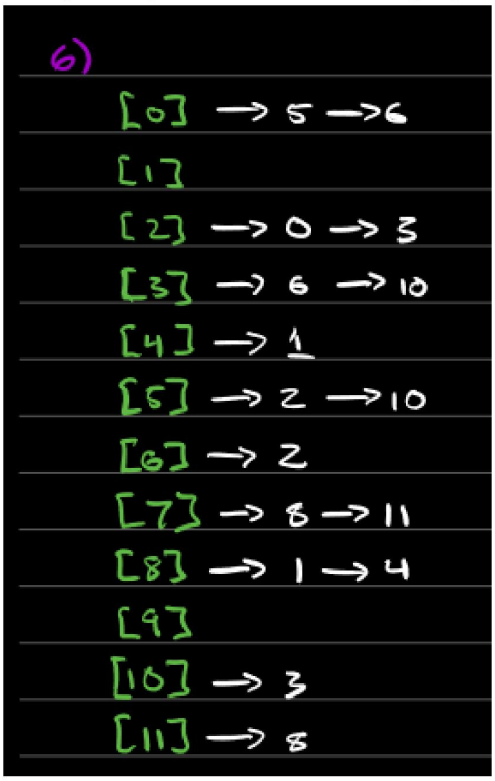
queue		marked[]		edgeTo[]		adj[]	
1	0	T	0		0	2 5	
	1	T	1		1	4	
	2	T	2	0	2	0 3 5	
	3	T	3	2	3	2	
	4		4		4	1	
	5	T	5	0	5	0 2	

queue		marked[]		edgeTo[]		adj[]	
4	0	T	0		0	2 5	
	1	T	1		1	4	
	2	T	2	0	2	0 3 5	
	3	T	3	2	3	2	
	4	T	4	1	4	1	
	5	T	5	0	5	0 2	



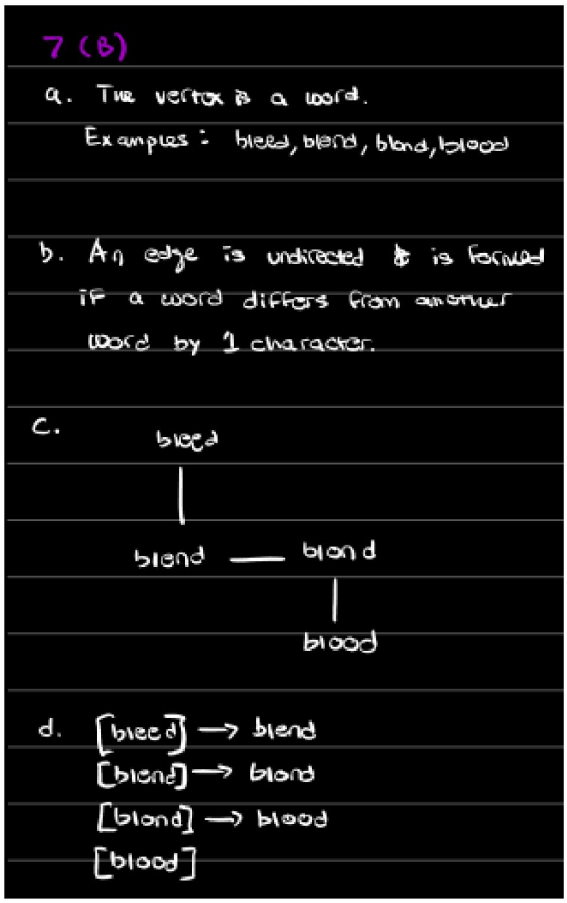
Question assigned to the following page: 6

6. **Adjacency lists for a directed graph**



Question assigned to the following page: 7

7, 8 & 9. **Graphs from application scenarios**



Question assigned to the following page: 8

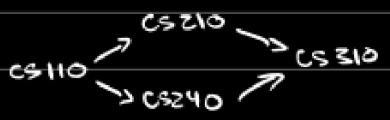
8(c)

a. The vertex is a course.

Examples: cs110, cs210, cs310, cs240

b. An edge is directed & exists if one class is a prerequisite of another.

c.



d.

[cs110] → cs210 → cs240

[cs210] → cs310

[cs240] → cs310

[cs 310]

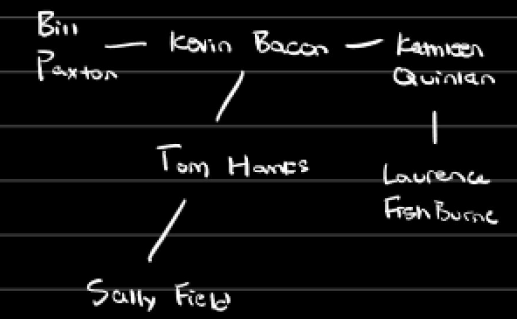
Question assigned to the following page: 9

9(D)

a. A vertex is an actor.
Examples: Tom Hanks, Sally Field

b. An edge is undirected and exists if an actor has shared a movie with another actor that has shared a movie with Kevin Bacon or another actor who has.

c.



d.

[Kevin Bacon] → Tom H. → Kathleen Q.
↳ Bill P.

[Tom Hanks] → Sally F.

[Sally Field]

[Laurence Fishburne]

[Bill Paxton]

[Kathleen Quinlan] → Laurence F.