pembahasan trial uas diskrit 2023

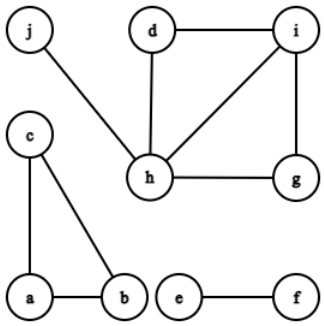
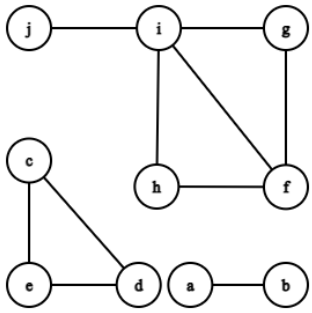
(lebih ke jawaban sih)

disusun oleh:

the one and only @kafeyangasli

SOAL A

1. GRAF

<table>
<tr><th colspan="2">NIM GANJIL</th><th colspan="2">NIM GENAP</th></tr>
<tr><td colspan="2">V = {a, b, c, d, e, f, g, h, i, j}
E = {(a, b), (b, c), (a, c), (e, f), (d, i), (d, h), (h, j), (h, i), (g, h), (g, i)}</td><td colspan="2">V = {a, b, c, d, e, f, g, h, i, j}
E = {(a, b), (c, d), (c, e), (d, e), (f, g), (f, i), (f, h), (g, i), (i, h), (i, j)}</td></tr>
<tr><td>Gambar Graf
(A)</td><td> 
</td><td>Gambar Graf
(A)</td><td> 
</td></tr>
<tr><td>Apakah graf G merupakan graf terhubung? (B)</td><td colspan="3">Graf G bukanlah graf terhubung, karena graf G memiliki tiga komponen yang terpisah tanpa ada sisi yang menghubungkan komponen-komponen tersebut.</td></tr>
<tr><td>Derajat
(C)</td><td>D(a) = 2
D(b) = 2
D(c) = 2
D(d) = 2
D(e) = 1
D(f) = 1
D(g) = 2
D(h) = 4
D(i) = 3
D(j) = 1</td><td>Derajat
(C)</td><td>D(a) = 1
D(b) = 1
D(c) = 2
D(d) = 2
D(e) = 2
D(f) = 2
D(g) = 2
D(h) = 3
D(i) = 4
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</table>

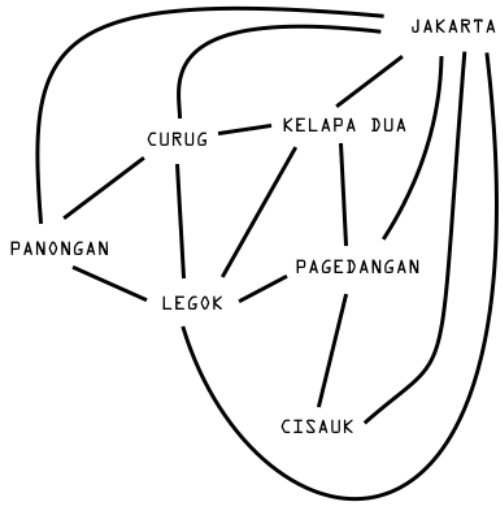
SOAL B

1. WELCH-POWELL ALGORITHM

<table>
<tr><th>NIM GANJIL</th><th>NIM GENAP</th></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>

*asumsikan daerah luar sebagai JAKARTA

a. Graf Dualnya adalah sebagai berikut:



b. Pewarnaan Bidang dengan Welch-Powell

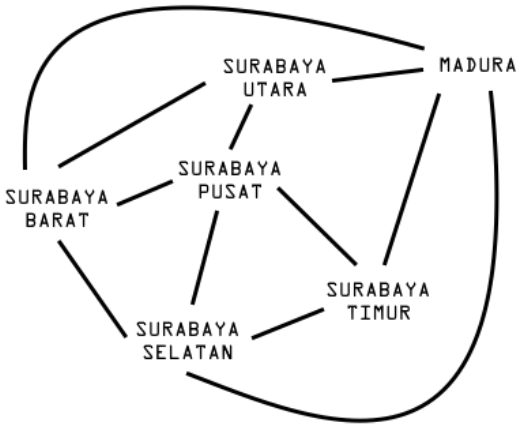
Vertex	JK	LE	PG	KD	CG	PN	CS
Degree	6	5	4	4	4	3	2
Colour	M	B	H	K	H	K	B

c. Bilangan Kromatik

$\chi(G_{ganjil}) = 4$

*asumsikan daerah luar sebagai MADURA

a. Graf Dualnya adalah sebagai berikut:



b. Pewarnaan Bidang dengan Welch-Powell

Vertex	MD	SB	SP	SS	ST	SU
Degree	4	4	4	4	3	3
Colour	M	B	M	H	B	H

c. Bilangan Kromatik

$\chi(G_{genap}) = 3$

2. HUFFMAN COMPRESSION

NIM GANJIL

Data Frekuensi

Karakter	P	A	C	F	K	U	N
Frekuensi	8	3	7	10	6	1	15

a. Pohon Huffman yang terbentuk

ITERASI PERTAMA

U	A	K	C	P	F	N
1	3	6	7	8	10	15

ITERASI KEDUA

4	K	C	P	F	N
U A	6	7	8	10	15

ITERASI KETIGA

C	P	10	F	N
7	8	4 K U A 6	10	15

NIM GANJIL

Data Frekuensi

Karakter	M	D	A	C	T	S	B
Frekuensi	6	10	3	7	5	2	17

a. Pohon Huffman yang terbentuk

ITERASI PERTAMA

S	A	T	M	C	D	B
2	3	5	6	7	10	17

ITERASI KEDUA

5	T	M	C	D	B
S A	5	6	7	10	17

ITERASI KETIGA

M	C	10	D	B
6	7	5 T S A 5	10	17

ITERASI KEEMPAT

10	F	15	N
4 K U A 6	10	C P 7 8	15

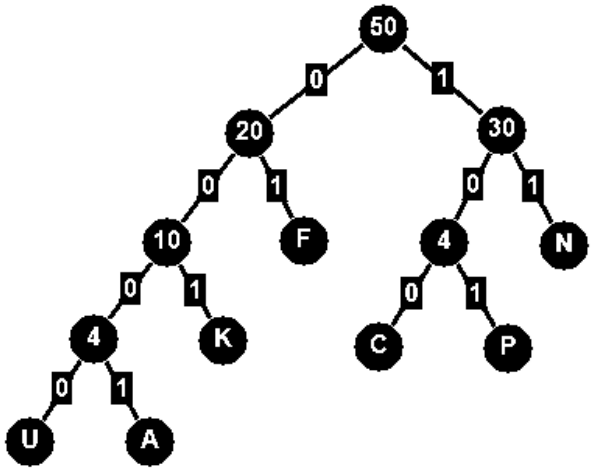
ITERASI KELIMA

15	N	20
C P 7 8	15	10 F 4 K 10 U A 6

ITERASI KEENAM

20	30
10 F 4 K 10 U A 6	15 N C P 15 7 8

POHON HUFFMAN



b. Kode Biner Data

N	11
F	01
K	001
C	100
P	101
U	0000
A	0001

c. Rasio Kompresi

$Original = 50 \times 8 = 400\ bit$

$Huffman = 30 + 20 + 18 + 21 + 24 + 4 + 12$
$= 129\ bit$

$Rasio = \left(1 - \frac{129}{400}\right) \times 100$
$\approx 67{,}75\%$

ITERASI KEEMPAT

10	D	13	B
5 T S A 5	10	M C 6 7	17

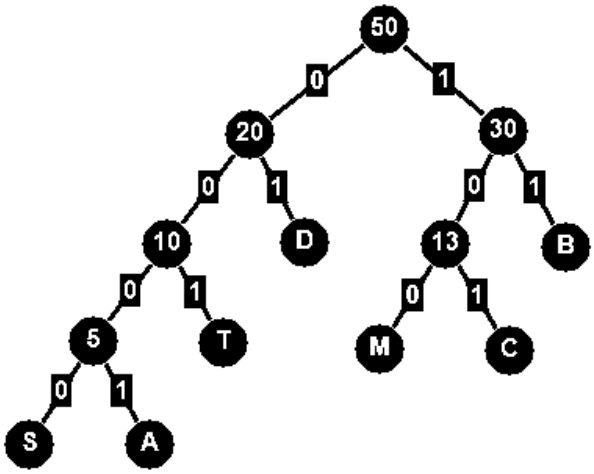
ITERASI KELIMA

13	B	20
M C 6 7	17	10 D 5 T 10 S A 5

ITERASI KEENAM

20	30
10 D 5 T 10 S A 5	13 B M C 17 6 7

POHON HUFFMAN



b. Kode Biner Data

B	11
D	01
T	001
M	100
C	101
S	0000
A	0001

c. Rasio Kompresi

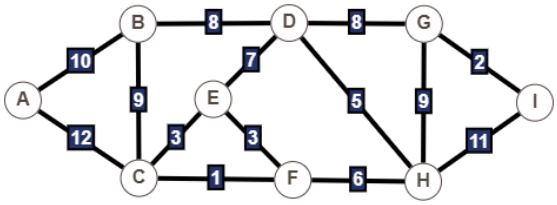
$Original = 50 \times 8 = 400\ bit$

$Huffman = 34 + 20 + 15 + 18 + 21 + 8 + 12$
$= 128\ bit$

$Rasio = \left(1 - \frac{128}{400}\right) \times 100$
$\approx 68\%$

3. SHORTEST PATH & MINIMUM SPANNING TREE

NIM GANJIL



https://graphonline.top/en/?graph=hEONfDCoqgarpTkSZZcst
**dikarenakan keambiguan soal, sisi DF dianggap tidak ada*

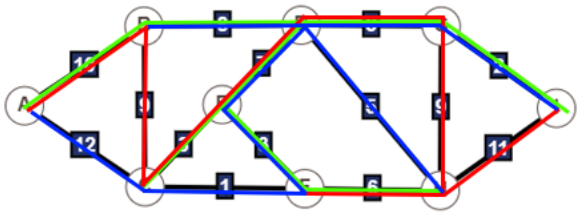
a. Djikstra Algorithm

	A	B	C	D	E	F	G	H	I
A	0A	10A	12A	XX	XX	XX	XX	XX	XX
B			12A	18B	XX	XX	XX	XX	XX
C				18B	15C	13C	XX	XX	XX
F				18B	15C		XX	19F	XX
E				18B			XX	19F	XX
D							26D	19F	XX
H							26D		30H
G									28G

Shortest Path from A to:

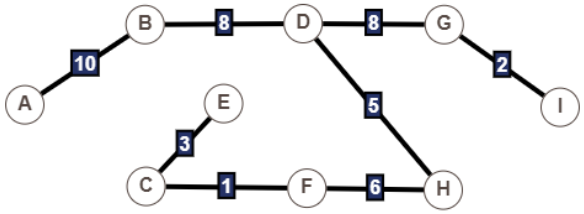
- B : A → B
- C : A → C
- D : A → B → D
- E : A → C → E
- F : A → C → F
- G : A → B → D → G
- H : A → C → F → H
- I : A → B → D → G → I

b. Tiga Spanning Tree
(bisa bervariasi, tidak harus persis seperti dibawah)



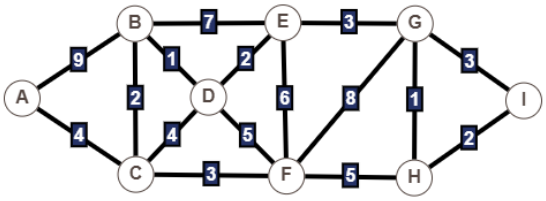
**setiap warna merepresentasikan satu spanning tree, karena saya malas menggambar ulang*

c. Minimum Spanning Tree
(*Total Derajat = 43*):



**tidak unik, CE bisa diganti dengan EF*

NIM GENAP



https://graphonline.top/en/?graph=BAYYXOvNUchpVwDiZZcst

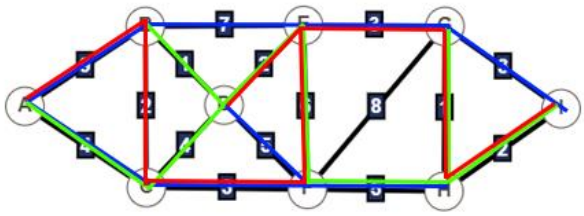
a. Djikstra Algorithm

	A	B	C	D	E	F	G	H	I
A	0A	9A	4C	XX	XX	XX	XX	XX	XX
C		6C		8C	XX	7C	XX	XX	XX
B				7B	13B	7C	XX	XX	XX
D					9D	7C	XX	XX	XX
F					9D		15F	12F	XX
E							12E	12F	XX
G								12F	15G
H									14H

Shortest Path from A to:

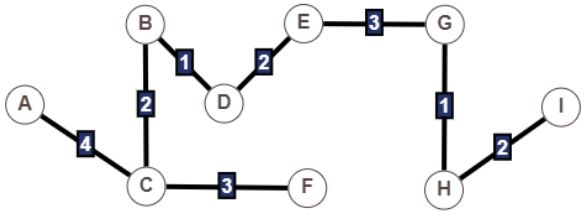
- B : A → C → B
- C : A → C
- D : A → C → B → D
- E : A → C → B → D → E
- F : A → C → F
- G : A → C → B → D → E → G
- H : A → C → F → H
- I : A → C → F → H → I

b. Tiga Spanning Tree
(bisa bervariasi, tidak harus persis seperti dibawah)



**setiap warna merepresentasikan satu spanning tree, karena saya malas menggambar ulang*

c. Minimum Spanning Tree
(*Total Derajat = 18*):



Proses Algoritma Kruskal:

Node	Degree
CF	1
GI	2
CE	3
EF	3
DH	5
FH	6
ED	7
BD	8
DG	8
BC	9
GH	9
AB	10
HI	11
AC	12

Proses Algoritma Kruskal:

Node	Degree
BD	1
GH	1
BC	2
DE	2
HI	2
EG	3
GI	3
CF	3
AC	4
CD	4
DF	5
FH	5
EF	6
BE	7
FG	8
AB	9