

Date

No

Bài 5 đề 1.

```

(a) void Dijkstra(int u){
    int pre[n+1];
    bool visited[n+1] = {false};
    for(int i=1; i <= n; i++) {
        if(i == u) {
            d[i] = 0;
            visited[i] = true;
        } else if(a[u][i] != 0) d[i] = a[u][i];
        else d[i] = INT_MAX;
        pre[i] = u;
    }
    for(int i=1; i <= n-1; i++) {
        int s = INT_MAX, mark = 0;
        for(int j=1; j <= n; j++) {
            if(d[j] < s && visited[j] == false) {
                s = d[j];
                mark = j;
            }
        }
        visited[mark] = true;
        for(int j=1; j <= n; j++) {
            if(d[j] > d[mark] + a[mark][j] && !visited[j]) {
                d[j] = d[mark] + a[mark][j];
                pre[j] = mark;
            }
        }
    }
}

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b) Loop	1	2	3	4	5	6	7	8
Initialize	[2,3]	$\infty, 3$	$0, 3$	$\infty, 3$	$\infty, 3$	$0, 3$	$\infty, 3$	$0, 3$
1		11,1		$\infty, 3$	$\infty, 3$	$\infty, 3$	$\infty, 3$	[5,3]
2		11,1		11,8	$\infty, 3$	5,8	$\infty, 3$	
3		11,1		11,8	[6,6]		$\infty, 3$	
4		11,1		11,8			$\infty, 3$	
5				[11,8]			13,2	
6								[13,2]
7								

A shortest path from: 3 → 1: 1 ∈ 3; $d[1] = 2$

3 → 2: 2 ∈ 1 ∈ 3; $d[2] = 11$

3 → 4: 4 ∈ 8 ∈ 3; $d[4] = 11$

3 → 5: 5 ∈ 6 ∈ 8 ∈ 3; $d[5] = 6$

3 → 6: 6 ∈ 8 ∈ 3; $d[6] = 5$

3 → 7: 7 ∈ 2 ∈ 1 ∈ 3; $d[7] = 13$

3 → 8: 8 ∈ 3; $d[8] = 4$

bài 5 đà 2:

```

a) void Bellman-Ford(int u){
    int pre[n+1];
    for(int i = 1; i <= n; i++) {
        pre[i] = u;
        if (a[u][i] != 0) d[i] = a[u][i];
        else d[i] = INT_MAX;
    }
    d[u] = 0;
    for(int i = 1; i <= n-1; i++) {
        for(int j = 1; j <= n; j++) {
            if (j != u) {
                for(int k = 1; k <= n; k++) {
                    if (d[j] > d[k] + a[j][k]) {
                        d[j] = d[k] + a[j][k];
                        pre[j] = k;
                    }
                }
            }
        }
    }
}

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b) Loop 1 2 3 4 5 6 7 8

Initialize $\infty, 5 \ 0, 5 \ \infty, 5 \ \infty, 5 \ 0, 5 \ 0, 5 \ 7, 5 \ \infty, 5 \ \infty, 5$

1 $\boxed{15,6} \ \boxed{18,1} \ \boxed{\cancel{22,2}} \ \boxed{\cancel{27,3}} \ 0,5 \ 0,5 \ 7,5 \ \infty, 5 \ \infty, 5$

2 $15,6 \ \boxed{18,1} \ \boxed{22,2} \ \boxed{27,3} \ 0,5 \ 7,5 \ \boxed{14,1} \ \boxed{24,3}$

3 $15,6 \ 18,1 \ 22,2 \ 27,3 \ 0,5 \ 7,5 \ 14,1 \ 24,3$

4

A shortest path from $5 \rightarrow 1; 1 \in E \subseteq S; d[1] = 15$

$5 \rightarrow 2; 2 \in E \subseteq S; d[2] = 18$

$5 \rightarrow 3; 3 \in E \subseteq 1 \in E \subseteq S; d[3] = 22$

$5 \rightarrow 4; 4 \in E \subseteq 2 \in E \subseteq 1 \in E \subseteq S; d[4] = 27$

$5 \rightarrow 6; 6 \in E \subseteq S; d[6] = 7$

$5 \rightarrow 7; 7 \in E \subseteq 6 \subseteq S; d[7] = 14$

$5 \rightarrow 8; 8 \in E \subseteq 2 \in E \subseteq 1 \in E \subseteq S; d[8] = 29$

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Bài 5 đề 3:

```

a) void Dijkstra(int u) {
    int pre[n+1];
    bool visited[n+1] = {false};
    for(int i=1; i<=n; i++) {
        if (i == u) {
            d[i] = 0;
            visited[i] = true;
        } else if (a[u][i] != 0) d[i] = a[u][i];
        else d[i] = INT_MAX;
        pre[i] = u;
    }

    for (int i=1; i<=n-1; i++) {
        int s = INT_MAX, mark = 0;
        for (int j=1; j<=n; j++) {
            if (d[j] < s && visited[j] == false) {
                s = d[j];
                mark = j;
            }
        }

        visited[mark] = true;
        for (int j=1; j<=n; j++) {
            if (d[j] > d[mark] + a[mark][j] && !visited[j]) {
                d[j] = d[mark] + a[mark][j];
                pre[j] = mark;
            }
        }
    }
}

```

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b) Loop	1	2	3	4	5	6	7	8
Initialize	$\infty, 2$	$0, 1$	$3, 2$	$\infty, 2$	$5, 2$	$\infty, 2$	$\infty, 2$	$\infty, 2$
1		$5, 3$			$5, 2$	$\infty, 2$	$\infty, 2$	$\infty, 2$
2		$15, 3$			$5, 2$	$\infty, 2$	$\infty, 2$	$\infty, 2$
3					$5, 2$	$\infty, 1$	$\infty, 2$	$\infty, 2$
4					$6, 5$	$\infty, 2$	$6, 5$	
5						$\infty, 2$		$6, 5$
6						$\infty, 2$		

A shortest path from : $q \rightarrow 1: 1 \leftarrow 3 \leftarrow 2; d[1] = 5$

$2 \rightarrow 3: 3 \leftarrow 2; d[3] = 3$

$2 \rightarrow 4: 4 \leftarrow 3 \leftarrow 2; d[4] = 4$

$2 \rightarrow 5: 5 \leftarrow 2; d[5] = 5$

$2 \rightarrow 6: 6 \leftarrow 5 \leftarrow 2; d[6] = 6$

$2 \rightarrow 7: \text{No short path}$

$2 \rightarrow 8: 8 \leftarrow 5 \leftarrow 2; d[8] = 6$

Bài 5 đề 4:

```

a) void Bellman-Ford (int u){
    int pre[n+1];
    for (int i=1; i<=n; i++) {
        pre[i] = u;
        if (a[u][i] != 0) d[i] = a[u][i];
        else d[i] = INT_MAX;
    }
    d[u] = 0;
    for (int i=1; i<=n-1; i++) {
        for (int j=1; j<=n; j++) {
            if (j != u) {
                for (int k=1; k<=n; k++) {
                    if (d[j] > d[k] + a[j][k]) {
                        d[j] = d[k] + a[j][k];
                        pre[j] = k;
                    }
                }
            }
        }
    }
}

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b) Loop

	1	2	3	4	5	6	7	8
Initialize	0,6	2,6	0,6	0,6	0,6	0,6	0,6	1,6
1	0,6	2,6	1,2	1,8	1,8	0,6	5,9	1,6
2	1,9	2,6	1,2	2,8	3,8	0,6	2,1	1,6
3	1,9	2,6	1,2	2,8	3,8	0,6	2,1	1,6

A shortest path from 6 → 1: 1 ← 4 ← 8 ← 6, $d[1] = 1$

6 → 2: 2 ← 6, $d[2] = 2$

6 → 3: 3 ← 2 ← 6; $d[3] = 1$

6 → 4: 4 ← 8 ← 6; $d[4] = 2$

6 → 5: 5 ← 8 ← 6; $d[5] = 3$

6 → 7: 7 ← 1 ← 4 ← 8 ← 6, $d[7] = 2$

6 → 8: 8 ← 6, $d[8] = 1$