Exercise 6. Answer Sheet

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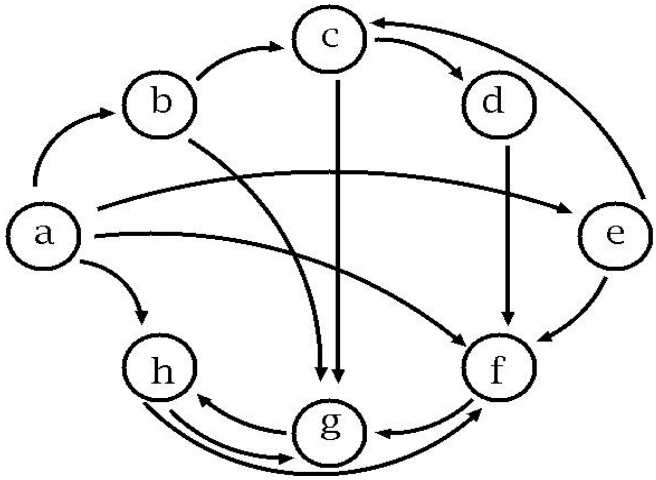
Problem 1. Given the graph below



a) *(10 points)* Fill the following matrix by putting 1 if there is an edge between nodes. Put 0 otherwise.

	a	b	c	d	e	f	g	h
a	0	1	0	0	1	1	0	1
b	0	0	1	0	0	0	1	0
c	0	0	0	1	0	0	1	0
d	0	0	0	0	0	1	0	0
e	0	0	1	0	0	1	0	0
f	0	0	0	0	0	0	1	0
g	0	0	0	0	0	0	0	1
h	0	0	0	0	0	1	1	0

b) *(40 points)* Write a program implementing Warshal's algorithm. Upload your code. Use your program to create a transitive closure G* of the graph above and show it in the space below.

Transitive closure defined by adjacency table

	a	b	c	d	e	f	g	h
a	1	1	1	1	1	1	1	1
b	0	1	1	1	0	1	1	1
c	0	0	1	1	0	1	1	1
d	0	0	0	1	0	1	1	1
e	0	0	1	1	1	1	1	1
f	0	0	0	0	0	1	1	1
g	0	0	0	0	0	1	1	1
h	0	0	0	0	0	1	1	1

<How to compile/ run>
Input of the graph data is already did in the program (initialize() method in Warshal_Graph class).
Please enter the command (Program source name is "Warshall_Graph.java":
javac Warshall_Graph.java
java Warshall_Graph

Problem 2. *(50 points)* Consider the following weight adjacency matrix.

	a	b	c	d	e	f	g	h
a	0	48	∞	8	20	∞	20	∞
b	∞	0	24	∞	9	∞	76	29
c	97	∞	0	∞	∞	∞	18	1
d	∞	52	34	0	29	∞	∞	∞
e	∞	∞	∞	∞	0	10	∞	∞
f	∞	10	85	43	∞	0	41	29
g	∞	∞	∞	76	38	∞	0	∞
h	28	42	∞	77	21	∞	11	0

Write a program implementing Floyd's algorithm. Upload your code. Given the matrix above, calculate all pairs shortest paths using your program and fill the table below:

All pairs shortest path table

	a	b	c	d	e	f	g	h
a	0	40	42	8	20	30	20	43
b	53	0	24	62	9	19	36	25
c	29	42	0	75	22	32	12	1
d	63	49	34	0	29	39	46	35
e	67	20	44	53	0	10	50	39
f	57	10	34	43	19	0	40	29
g	105	58	82	76	38	48	0	77
h	28	41	65	74	21	31	11	0

<How to compile/ run>
Input of the graph data is already did in the program
(adjacencyMatrixOfProblem2() method in Floyd_Graph class).
Please enter the command (Program source name is “Floyd_Graph.java”:
javac Floyd_Graph.java
java Floyd_Graph