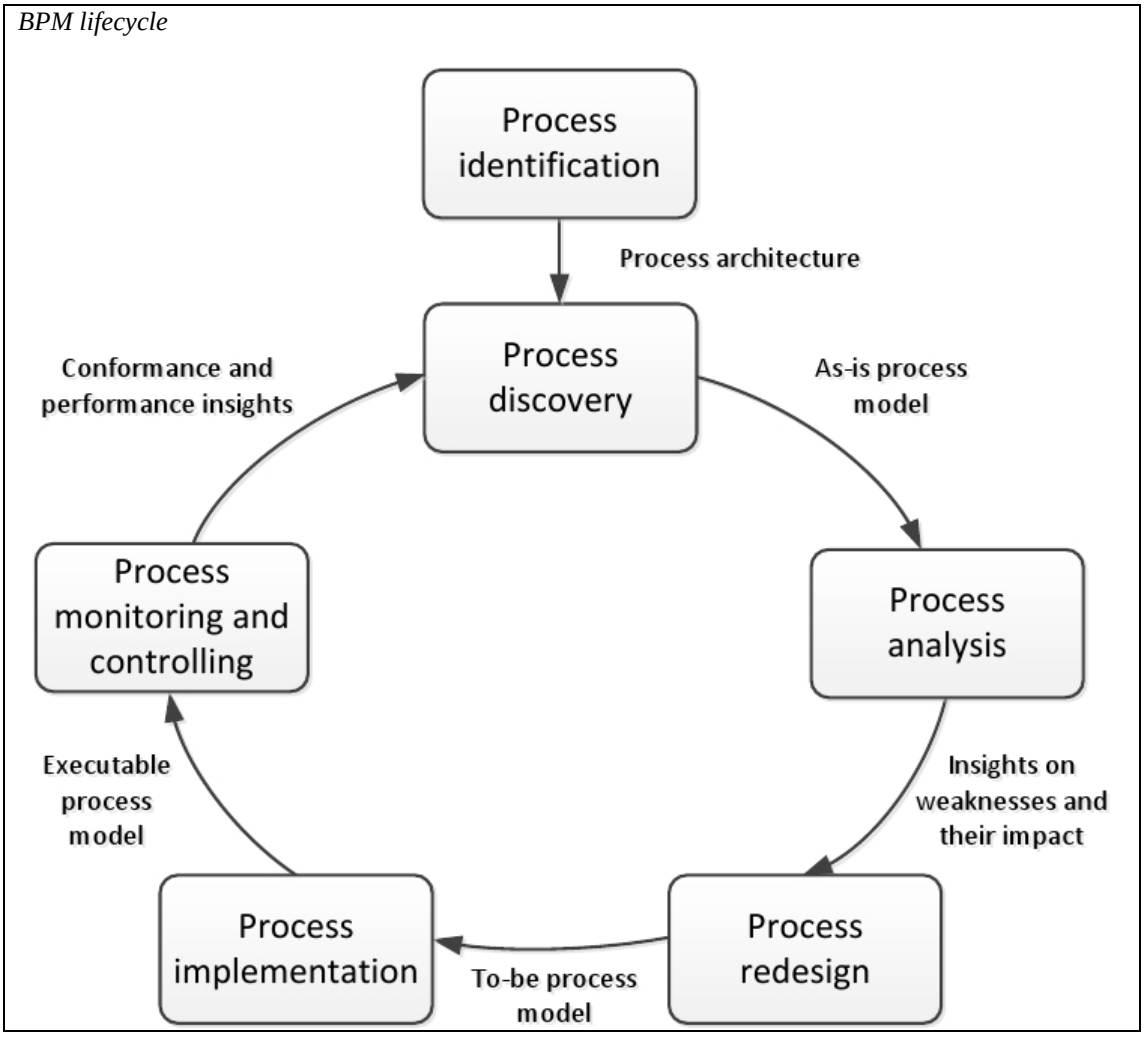
Solution forms – Assignment 1

Name:
Identity number:

1a

BPM lifecycle



1b

Types of BPMSs

1. Production workflow system

2. Case handling system

3. Ad-hoc workflow system

4. Groupware

(1. is highest level of support – 4. is the lowest level of support)

Answer to 1c on the other side of this form.

Solution forms – Assignment 1

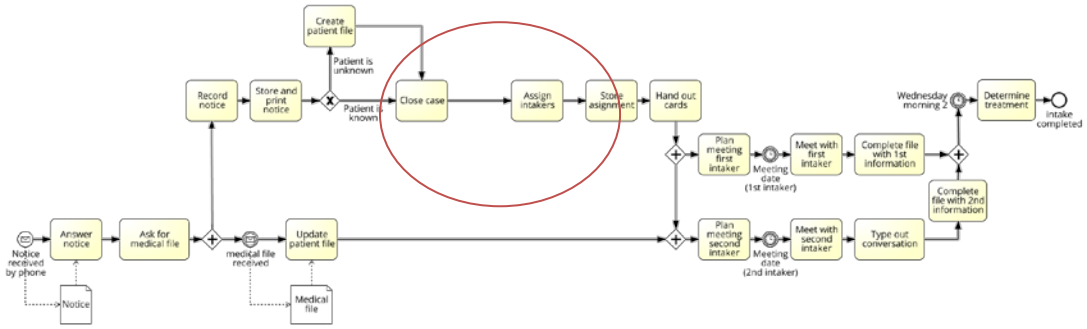
1c

Process fragment (1) Livelock: K keeps on being executed through the AND-gateway, the process therefore never ends.
Process fragment (2) Potential lack of synchronization when both L and M are initiated. Completion of each of these will separately activate the XOR-join. The remainder of the process is executed twice.
Process Fragment (3) Similar to the previous fragment: the XOR-join synchs twice.
Process Fragment (4) Either P or Q is executed, but the AND-join can then never synchronize. This results in a deadlock.

Solution forms – Assignment 2

Name:
Identity number:

2a

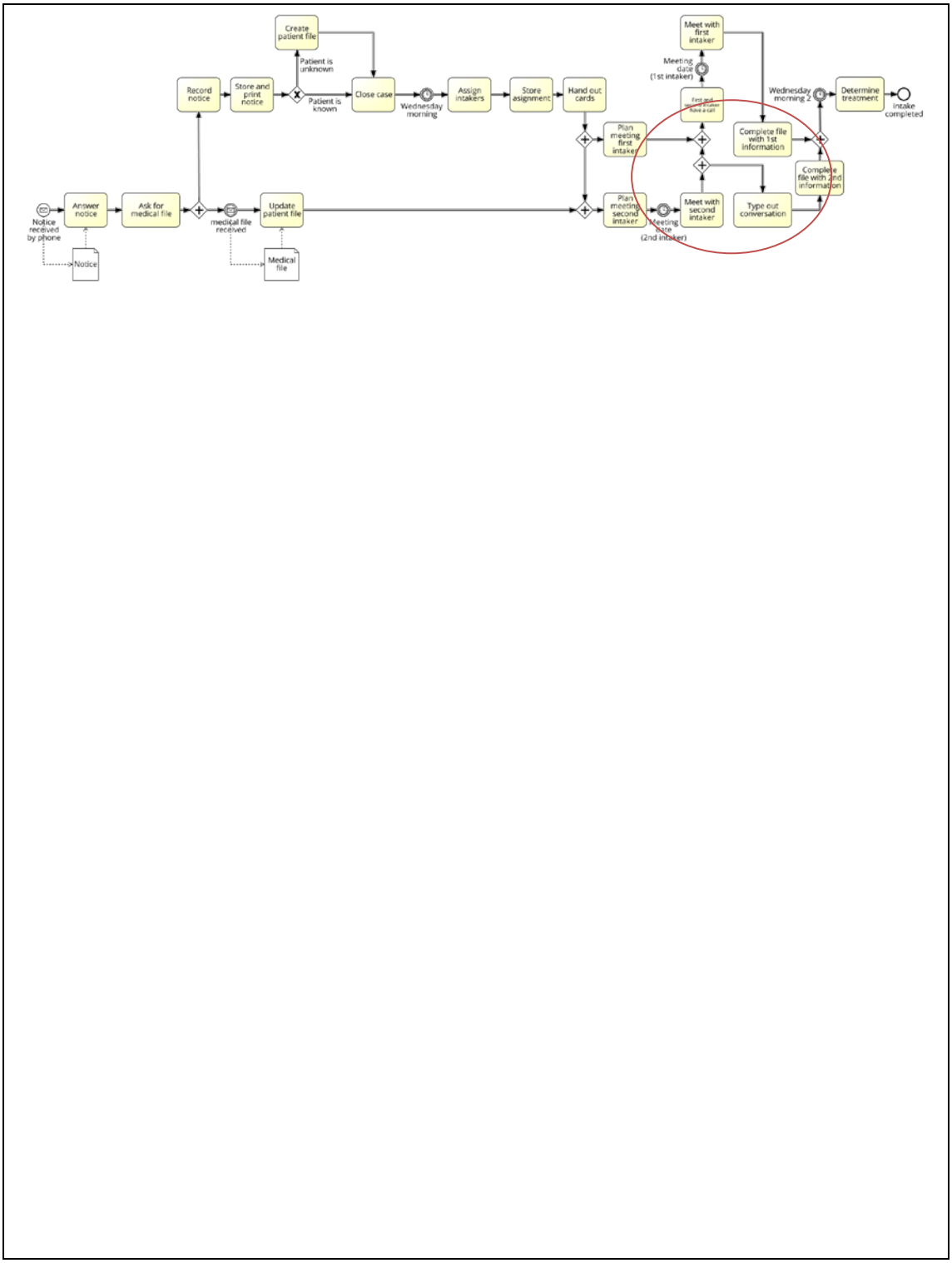


Note: Because of the case-based heuristic, the event that refers to the weekly meetings just before the 'assign intakers' activity is removed.

Answer to 2b on the other side of this form.

Solution forms – Assignment 2

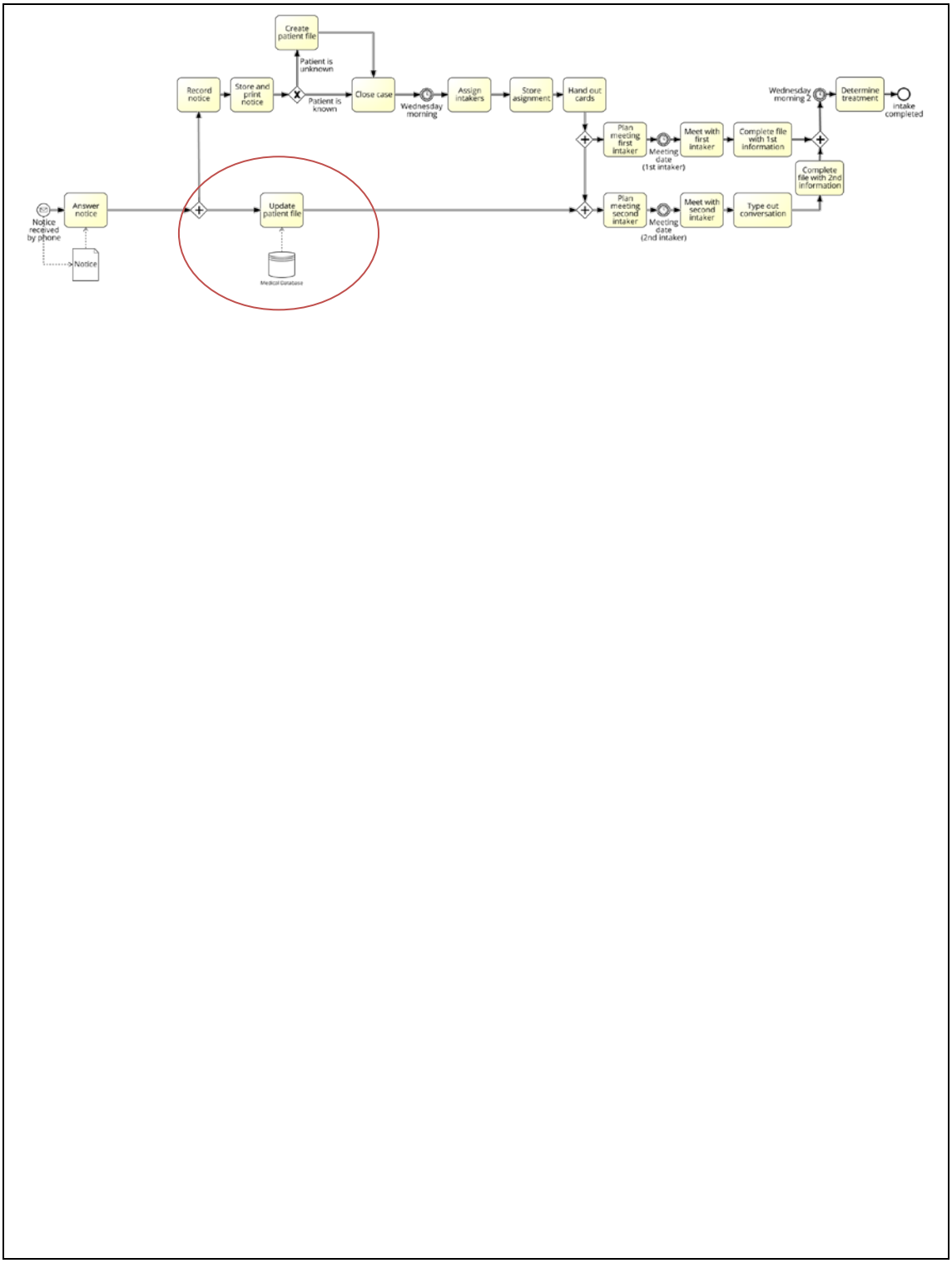
2b



Solution forms – Assignment 2

Name:
Identity number:

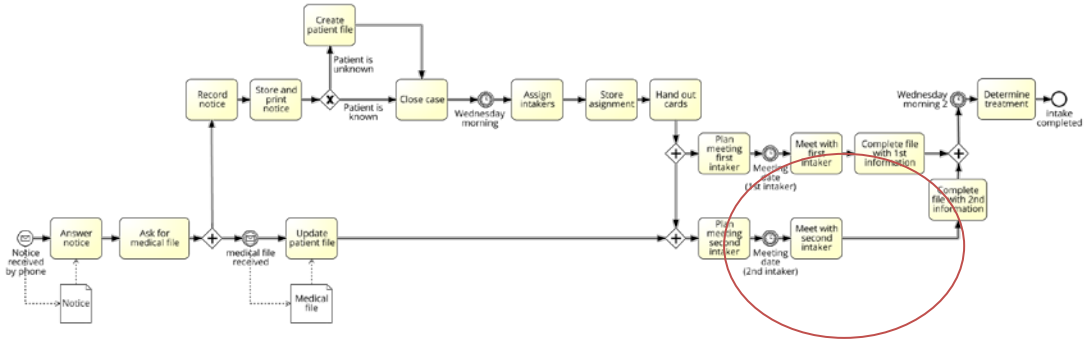
2c



Answer to 2d on the other side of this form.

Solution forms – Assignment 2

2d



Note: In this solution, the ‘type out conversation’ activity is removed. In addition, it is okay to add an automated system or database that captures the information from the conversation.

Solution forms – Assignment 3

Name:
Identity number:

3a

Since there is only one resource available for each task, there is *resource contention* (see section 7.3). This means that it will not do to simply add processing times, since queueing will arise. Other hints that queueing theory should be applied is that the arrival pattern (Poisson) and service time distributions (negative exponential) are explicitly mentioned. All this info allows for and justifies the use of the M/M/1 formulae. The approach to solve this assignment is similar to the exercise that was dealt with and solved in the lecture of week 4, as well as to Exercise 7.14 in the book, which has a correct solution on the Discussion Form of Blackboard.

Gamma	λ (arrival)	μ Capacity	ρ utilization $=\lambda/\rho$	L in process $=\rho/(1-\rho)$
Q	10	15	0.66667	2
MA	2	30	0.06667	0.07143
MB	8	30	0.26667	0.36364
C	9.6	12	0.8	4
MU	0.88	30	0.02933	0.03022
	number in system			6.46528

Delta	λ (arrival)	μ Capacity	ρ utilization $=\lambda/\rho$	L in process $=\rho/(1-\rho)$
C	10	12	0.83333	5
Q	9.5	15	0.63333	1.72727
MU	0.5	30	0.01667	0.01695
MA	1.9	30	0.06333	0.06762
MB	7.6	30	0.25333	0.33929
	number in system			7.15112

Ergo: design of Gamma is better – it has a lower number of cases in the system (i.e. approx. 6.47).

Answer to 3b on the other side of this form.

Solution forms – Assignment 3

3b

	$L = \lambda * W$		(Little's Law)		
L	λ	W			
6.46528	10	0.64653	hours	38.79171	**39 minutes**

Solution forms – Assignment 4

Name:
Identity number:

4a

T_I

$\{ a, c \}$

T_O

$\{ j \}$

Footprint matrix

	a	b	c	d	e	f	g	h	i	j
a	#	→	#	#	#	#	#	#	#	#
b	←	#	#	#	→	#	#	#	#	#
c	#	#	#	#	→	#	#	#	#	#
d	#	#	#	#	#	#	#	#	#	#
e	#	←	←	#	#	→	#	#	#	#
f	#	#	#	#	←	#	→	#	#	#
g	#	#	#	#	#	←	#	→	→	#
h	#	#	#	#	#	#	←	#	||	→
i	#	#	#	#	#	#	←	||	#	→
j	#	#	#	#	#	#	#	←	←	#

Answer to 4b on the other side of this form.

Solution forms – Assignment 4

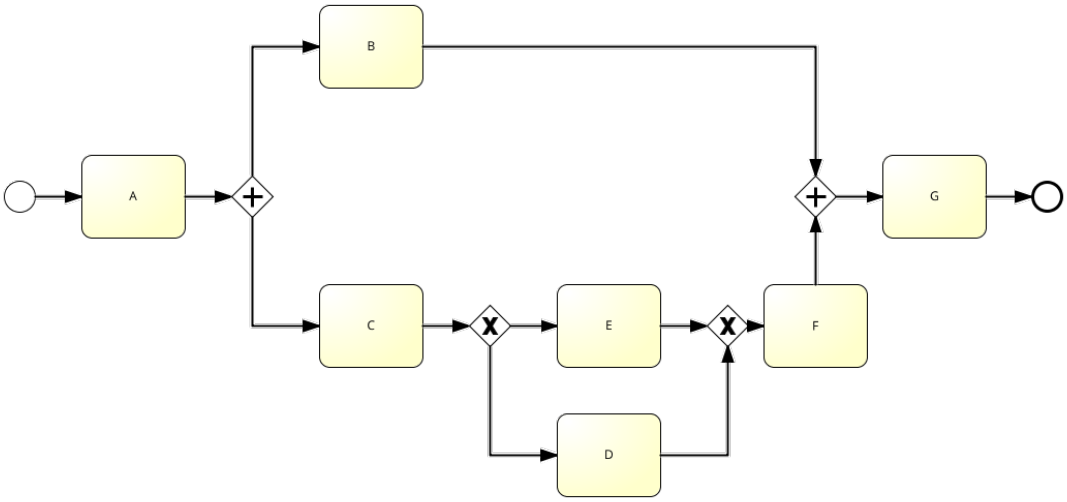
4b

[<q, ma, c>, <q, ma, c, mu>, <q, mb, c>, <q, mb, c, mu>, <q, mb, mu>]

Solution forms – Assignment 4

Name:
Identity number:

4c



Note that punctual interpretations of the alpha algorithm that led to a different closure of the process were also considered as correct.

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