Authors:
Erick Rosete Beas — er165@uni-freiburg.de
Jessica Lizeth Borja Diaz — jb986@uni-freiburg.de

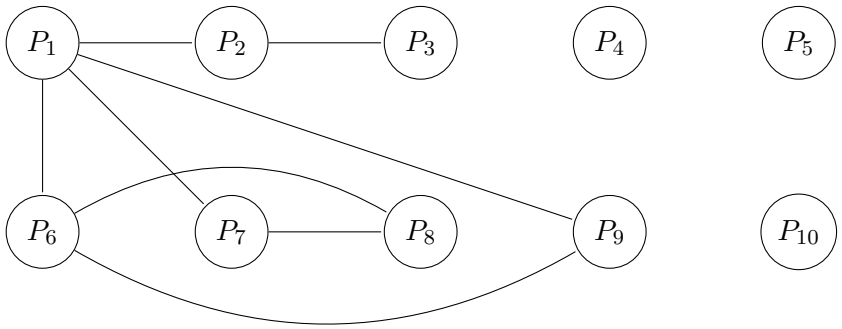
Principles of AI Planning

Exercise Sheet 9

10.01.2020

Exercise 9.1 - Additive patterns and canonical heuristic

(a) **Specify the compatibility graph of $\mathcal{C}$ and determine its maximal cliques**



Maximal Cliques		
$\{P_1, P_2\}$	$\{P_1, P_6, P_9\}$	$\{P_1, P_7\}$
$\{P_7, P_8\}$	$\{P_6, P_8\}$	$\{P_2, P_3\}$
$\{P_4\}$	$\{P_5\}$	$\{P_{10}\}$

(b) **Determine the canonical heuristic $h^{\mathcal{C}}$ and simplify it as much as possible**

i	h^{P_i}
1	1
2	5
3	4
4	13
5	0
6	1
7	1
8	1
9	0
10	1

Cliques heuristics	
Clique	$h^{\mathcal{C}}$
$\{P_1, P_2\}$	6
$\{P_1, P_6, P_9\}$	2
$\{P_1, P_7\}$	2
$\{P_7, P_8\}$	2
$\{P_6, P_8\}$	2
$\{P_2, P_3\}$	9
$\{P_4\}$	13
$\{P_5\}$	0
$\{P_{10}\}$	1

$h^{\mathcal{C}} = 13$

(c) **Which patterns in $\mathcal{C}$ can be omitted and why?**

(d) **What would the canonical heuristic look like if we omitted those patterns before even constructing the compatibility graph**

Exercise 9.2 - Orthogonality and pairwise orthogonality