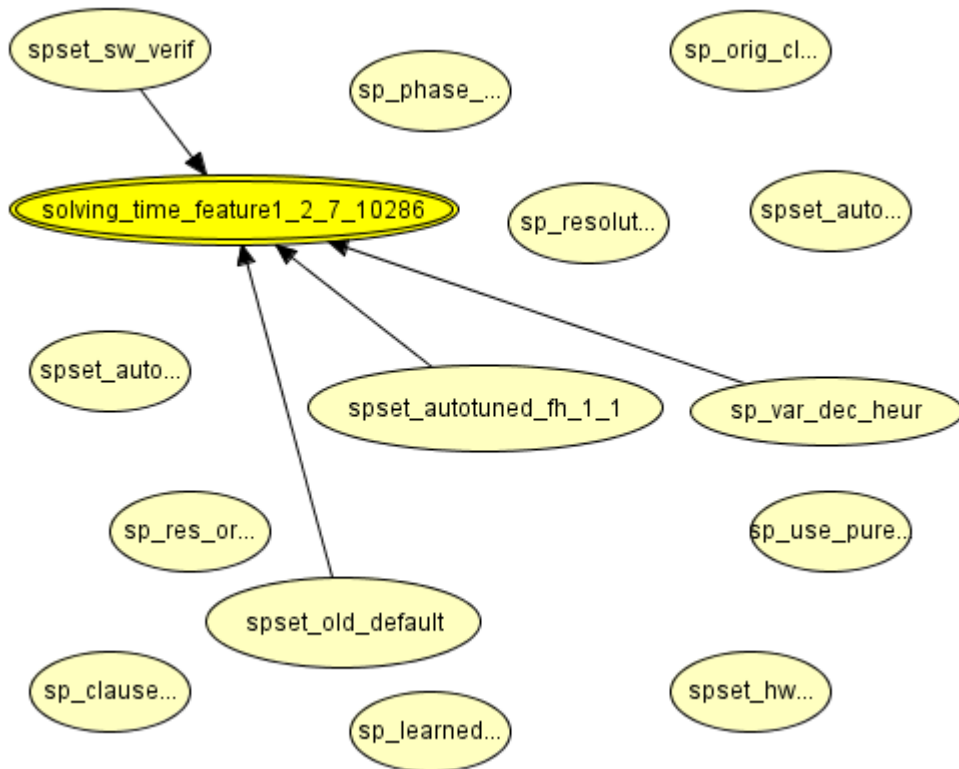
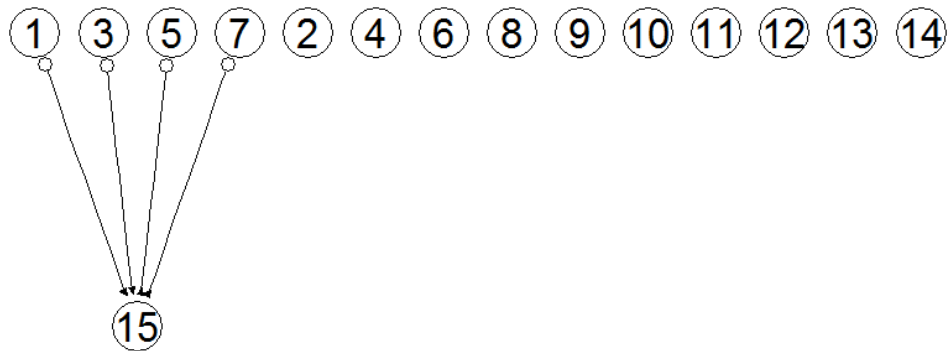


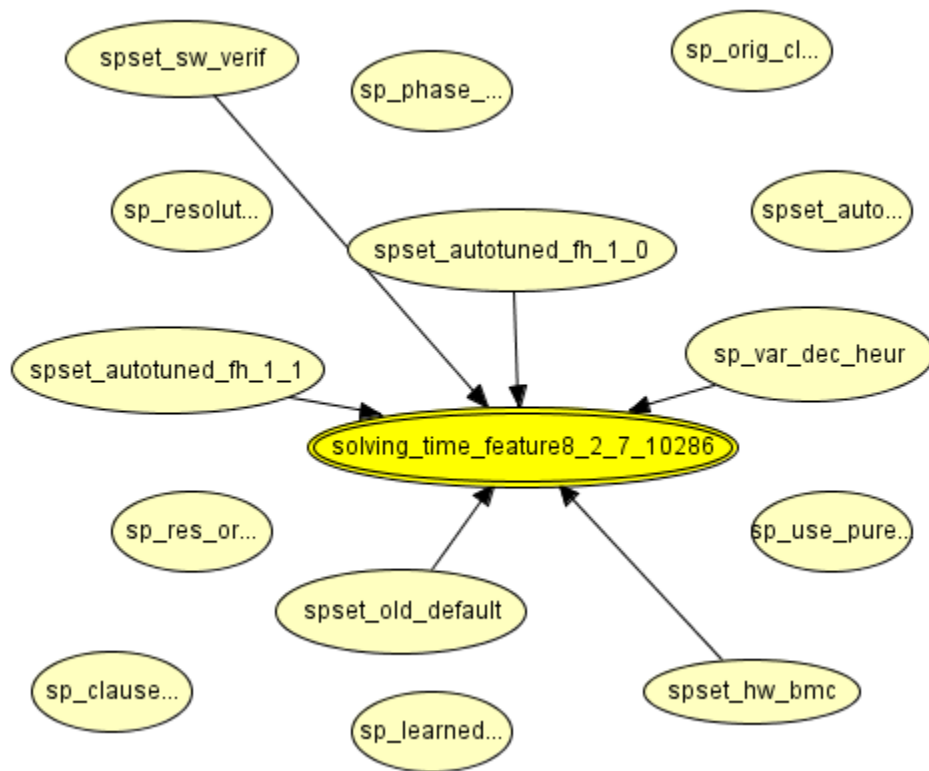
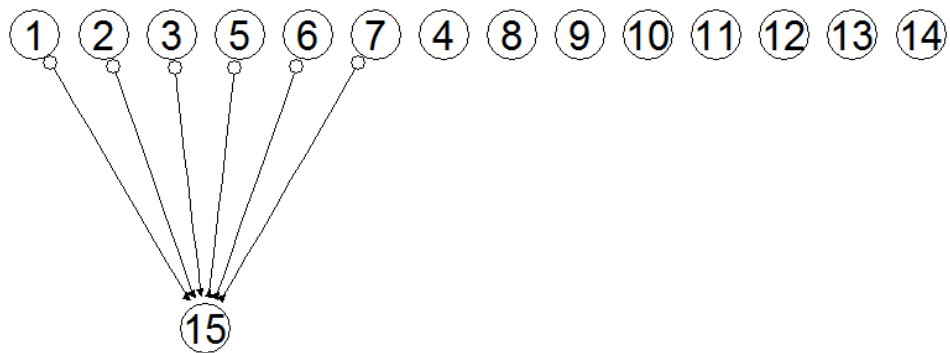
# SPEAR14-1

[1] "spset-old-default"	"spset-autotuned-fh-1-0"	"spset-autotuned-fh-1-1"
[4] "spset-autotuned-fh-1-2"	"spset-sw-verif"	"spset-hw-bmc"
[7] "sp-var-dec-heur"	"sp-learned-clause-sort-heur"	"sp-orig-clause-sort-heur"
[10] "sp-res-order-heur"	"sp-clause-del-heur"	"sp-phase-dec-heur"
[13] "sp-resolution"	"sp-use-pure-literal-rule"	"solving-time-feature1-2-7-10286"



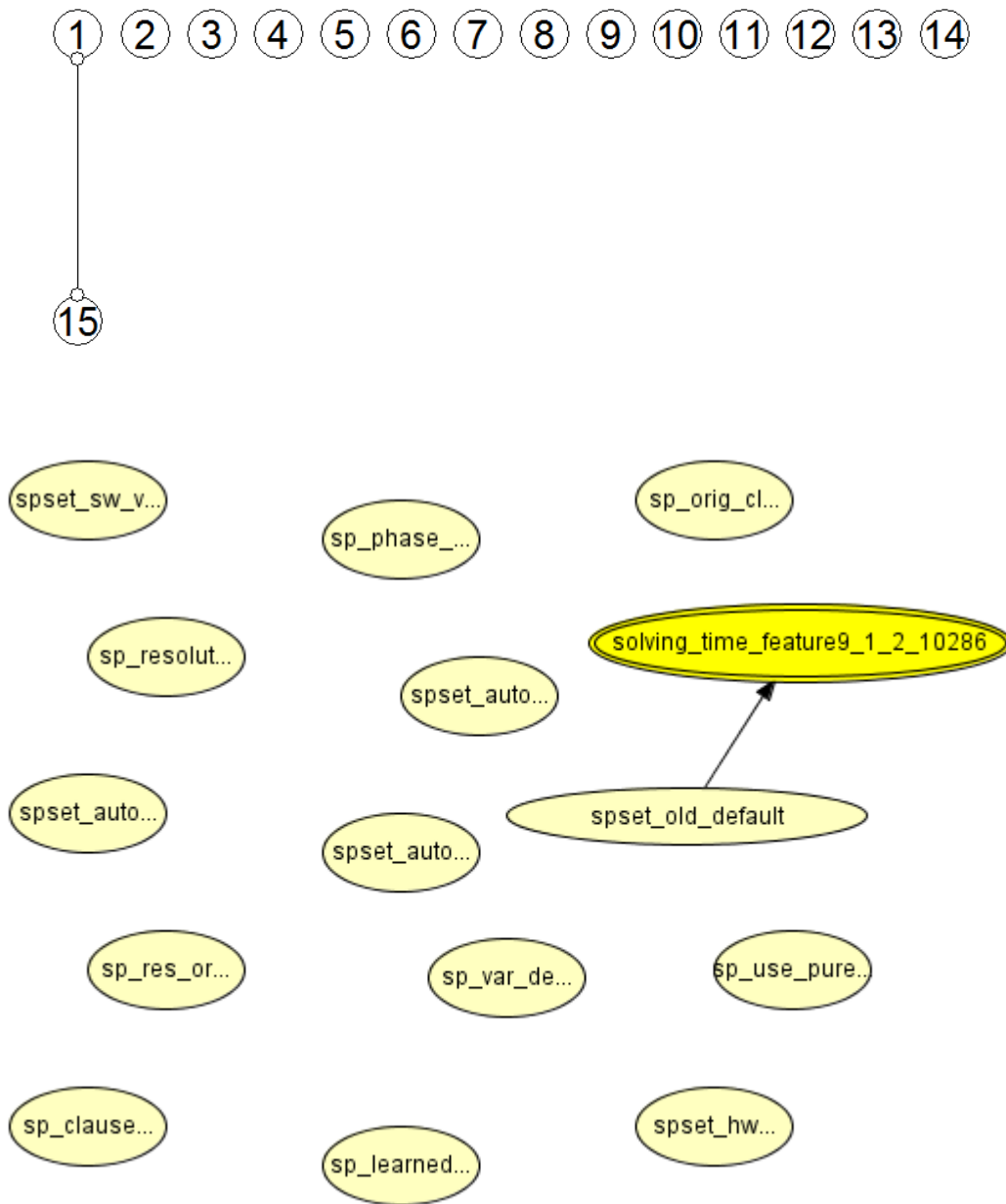
## SPEAR14-2

[1] "spset-old-default"	"spset-autotuned-fh-1-0"	"spset-autotuned-fh-1-1"
[4] "spset-autotuned-fh-1-2"	"spset-sw-verif"	"spset-hw-bmc"
[7] "sp-var-dec-heur"	"sp-learned-clause-sort-heur"	"sp-orig-clause-sort-heur"
[10] "sp-res-order-heur"	"sp-clause-del-heur"	"sp-phase-dec-heur"
[13] "sp-resolution"	"sp-use-pure-literal-rule"	"solving-time-feature8-2-7-10286"



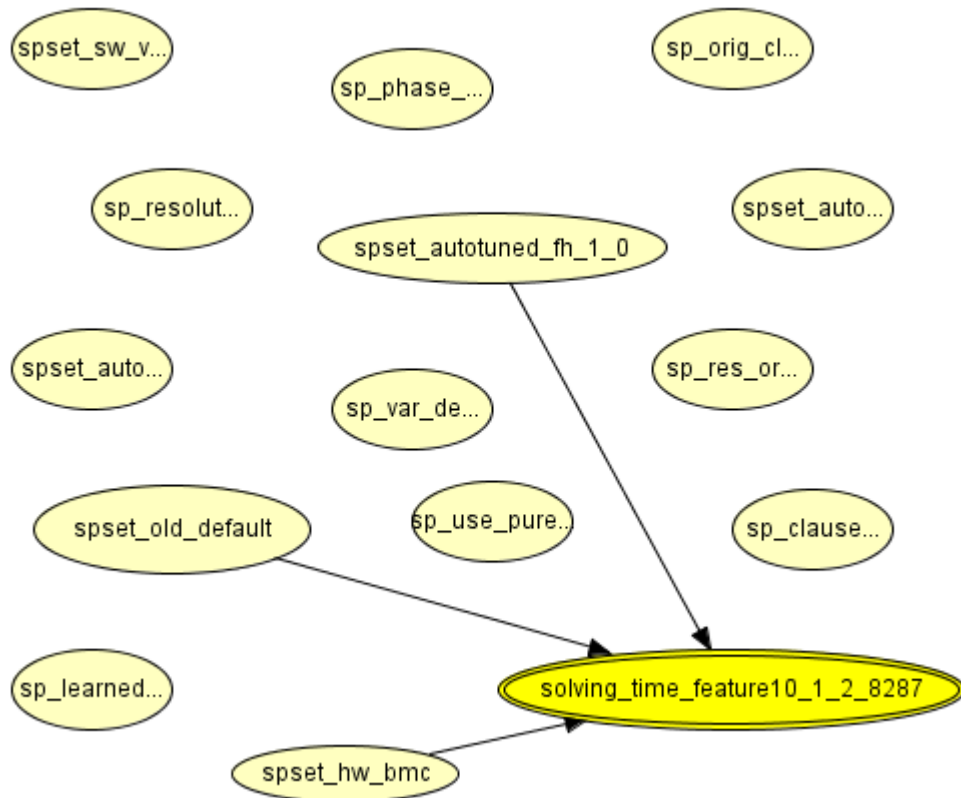
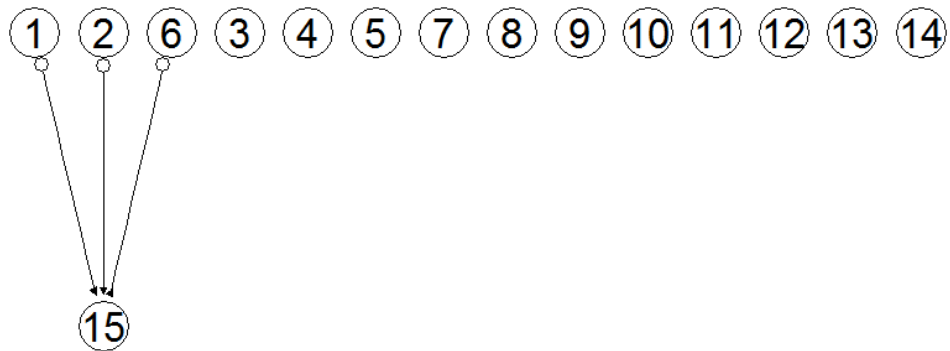
### SPEAR14-3

[1] "spset-old-default"	"spset-autotuned-fh-1-0"	"spset-autotuned-fh-1-1"
[4] "spset-autotuned-fh-1-2"	"spset-sw-verif"	"spset-hw-bmc"
[7] "sp-var-dec-heur"	"sp-learned-clause-sort-heur"	"sp-orig-clause-sort-heur"
[10] "sp-res-order-heur"	"sp-clause-del-heur"	"sp-phase-dec-heur"
[13] "sp-resolution"	"sp-use-pure-literal-rule"	"solving-time-feature9-1-2-10286"



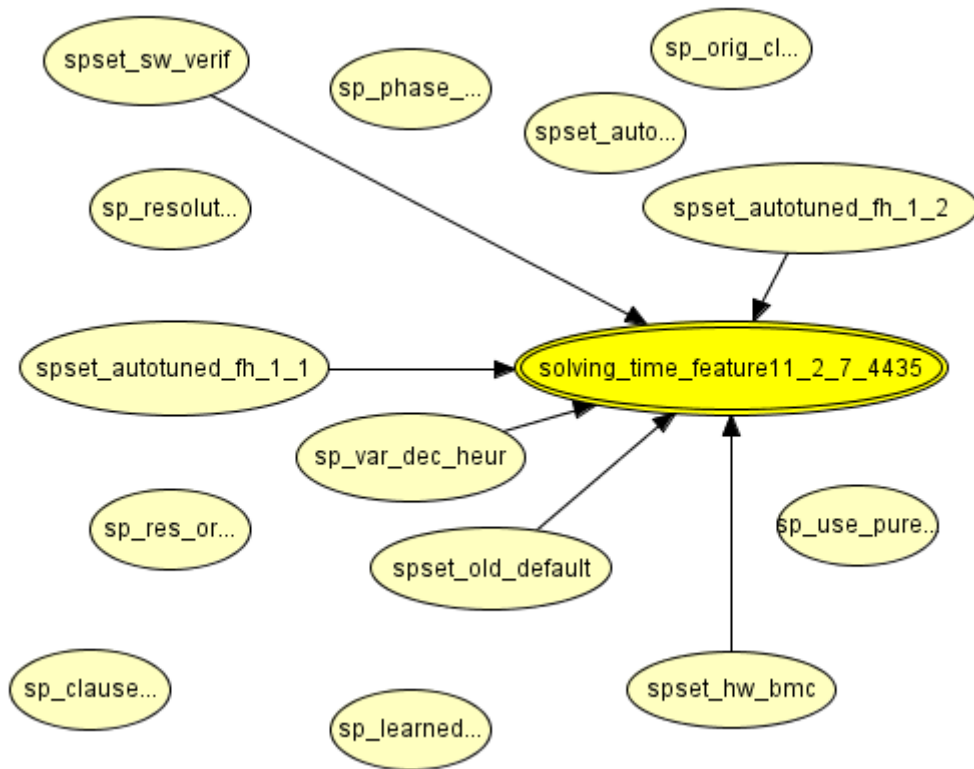
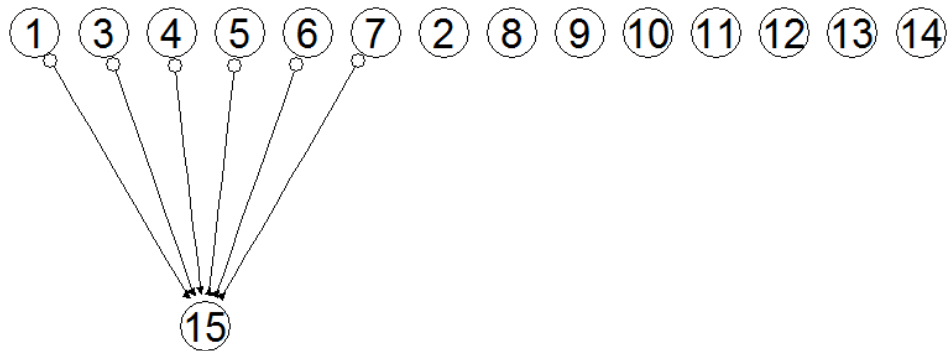
# SPEAR14-4

[1] "spset-old-default"	"spset-autotuned-fh-1-0"	"spset-autotuned-fh-1-1"
[4] "spset-autotuned-fh-1-2"	"spset-sw-verif"	"spset-hw-bmc"
[7] "sp-var-dec-heur"	"sp-learned-clause-sort-heur"	"sp-orig-clause-sort-heur"
[10] "sp-res-order-heur"	"sp-clause-del-heur"	"sp-phase-dec-heur"
[13] "sp-resolution"	"sp-use-pure-literal-rule"	"solving-time-feature10-1-2-8287"



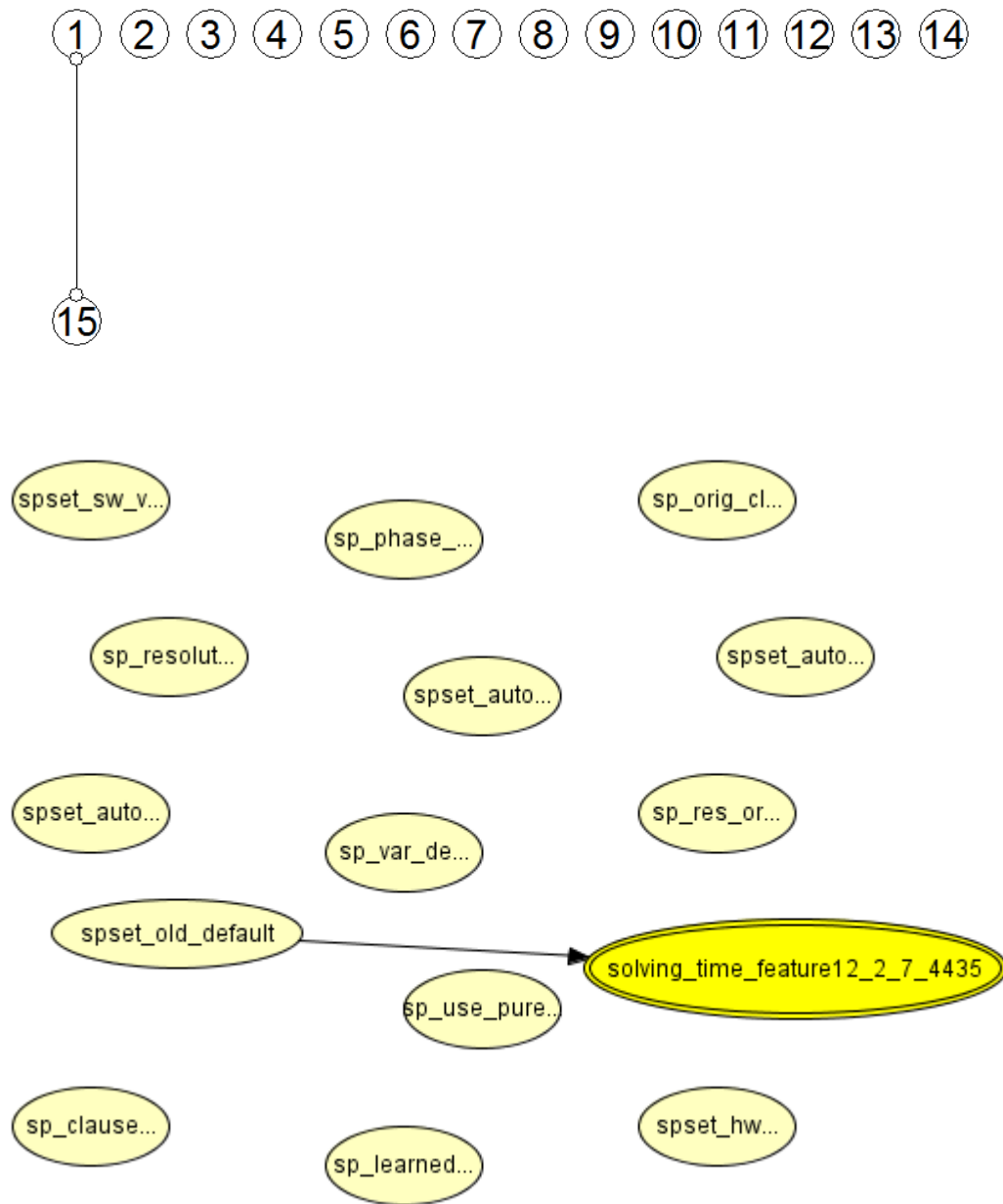
# SPEAR14-5

[1] "spset-old-default"	"spset-autotuned-fh-1-0"	"spset-autotuned-fh-1-1"
[4] "spset-autotuned-fh-1-2"	"spset-sw-verif"	"spset-hw-bmc"
[7] "sp-var-dec-heur"	"sp-learned-clause-sort-heur"	"sp-orig-clause-sort-heur"
[10] "sp-res-order-heur"	"sp-clause-del-heur"	"sp-phase-dec-heur"
[13] "sp-resolution"	"sp-use-pure-literal-rule"	"solving-time-feature11-2-7-4435"



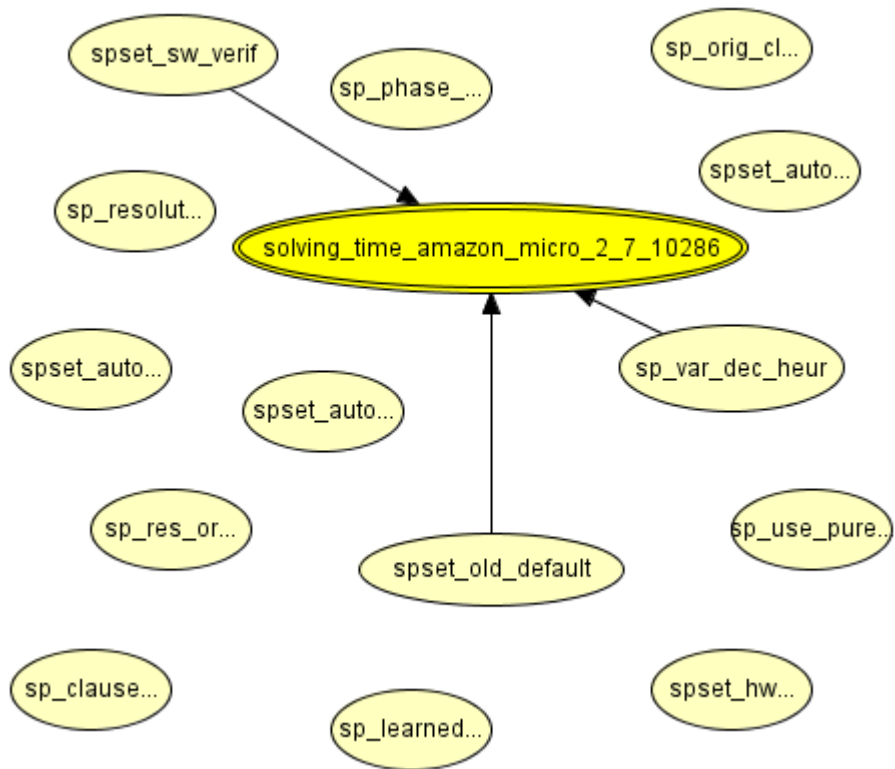
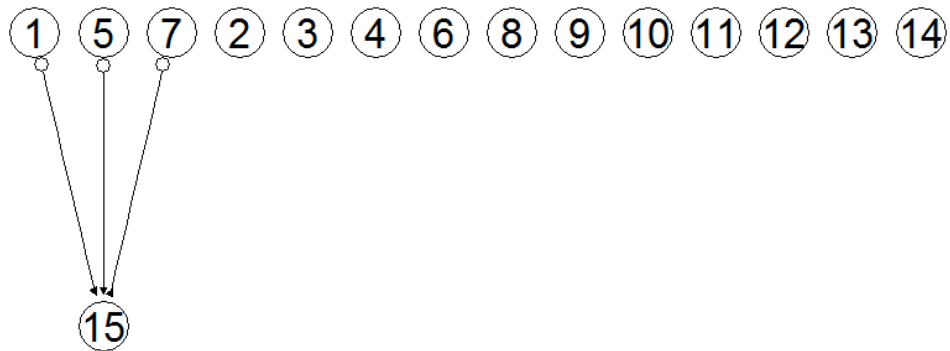
# SPEAR14-6

[1] "spset-old-default"	"spset-autotuned-fh-1-0"	"spset-autotuned-fh-1-1"
[4] "spset-autotuned-fh-1-2"	"spset-sw-verif"	"spset-hw-bmc"
[7] "sp-var-dec-heur"	"sp-learned-clause-sort-heur"	"sp-orig-clause-sort-heur"
[10] "sp-res-order-heur"	"sp-clause-del-heur"	"sp-phase-dec-heur"
[13] "sp-resolution"	"sp-use-pure-literal-rule"	"solving-time-feature12-2-7-4435"



# SPEAR14-7

[1] "spset-old-default"	"spset-autotuned-fh-1-0"	"spset-autotuned-fh-1-1"
[4] "spset-autotuned-fh-1-2"	"spset-sw-verif"	"spset-hw-bmc"
[7] "sp-var-dec-heur"	"sp-learned-clause-sort-heur"	"sp-orig-clause-sort-heur"
[10] "sp-res-order-heur"	"sp-clause-del-heur"	"sp-phase-dec-heur"
[13] "sp-resolution"	"sp-use-pure-literal-rule"	"solving-time-amazon-micro-2-7-10286"



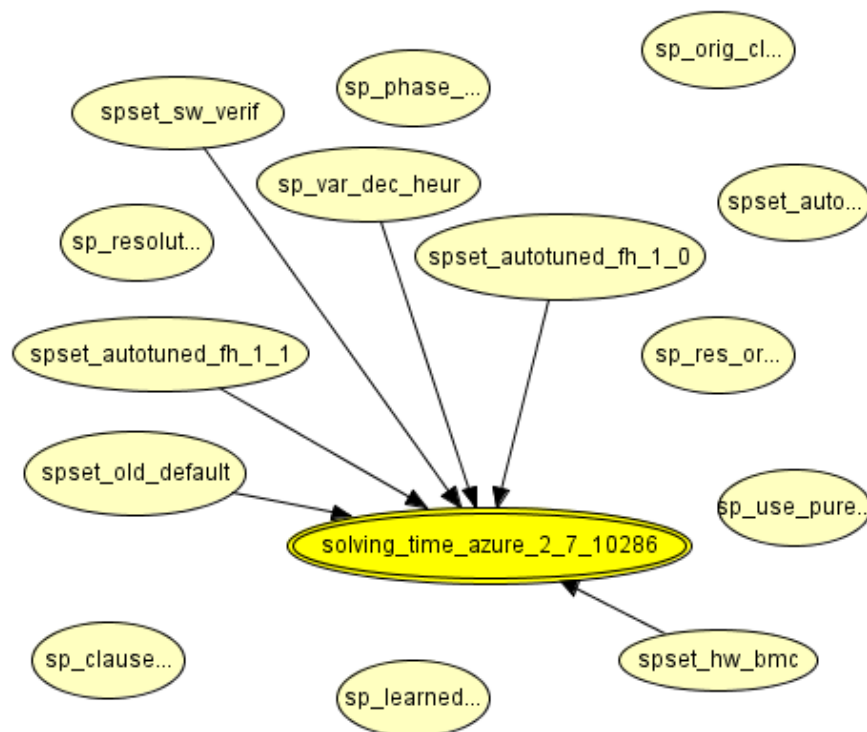
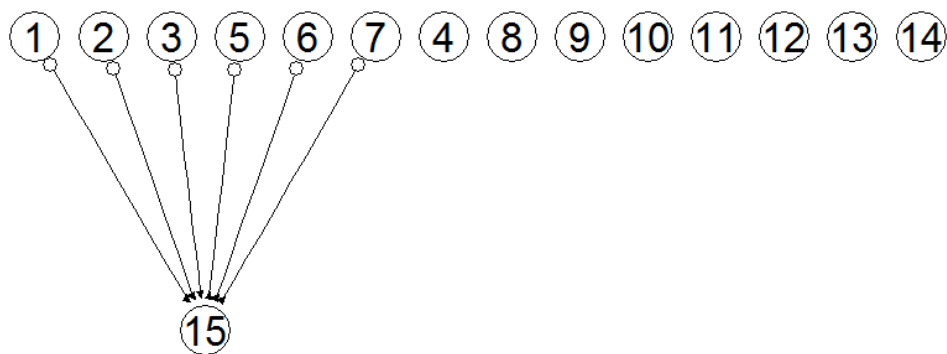
# SPEAR14-8

[1] "spset-old-default" "spset-autotuned-fh-1-0" "spset-autotuned-fh-1-1" "spset-autotuned-fh-1-2"

[5] "spset-sw-verif" "spset-hw-bmc" "sp-var-dec-heur" "sp-learned-clause-sort-heur"

[9] "sp-orig-clause-sort-heur" "sp-res-order-heur" "sp-clause-del-heur" "sp-phase-dec-heur"

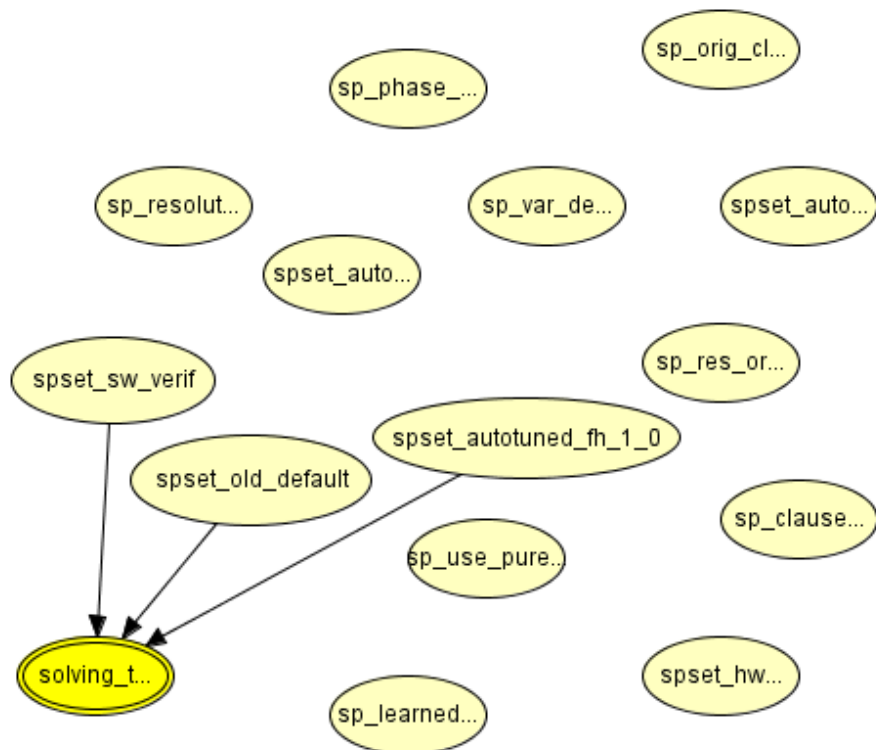
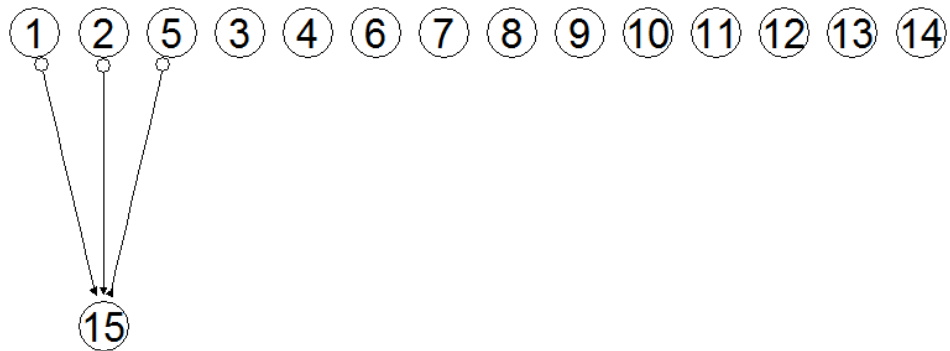
[13] "sp-resolution" "sp-use-pure-literal-rule" "solving-time-azure-2-7-10286"





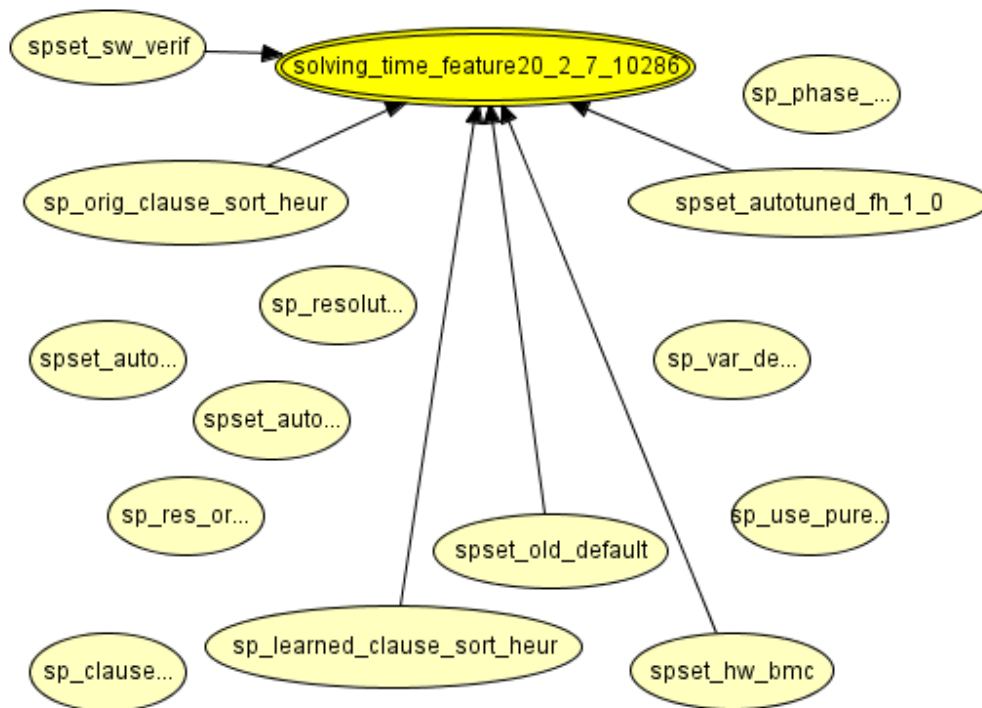
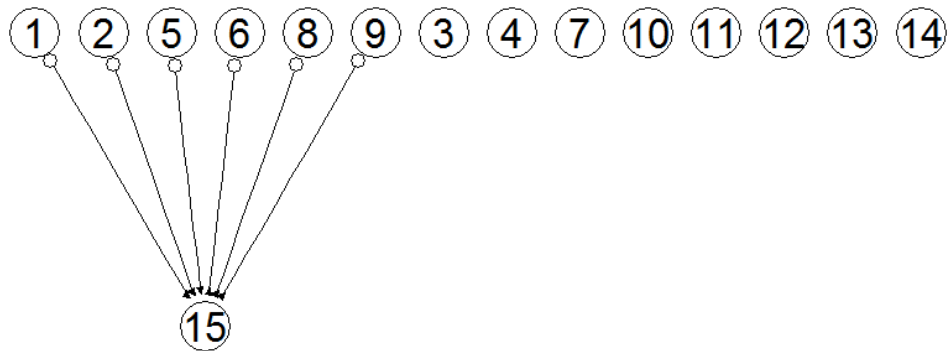
# SPEAR14-9

[1] "spset-old-default"	"spset-autotuned-fh-1-0"	"spset-autotuned-fh-1-1"
[4] "spset-autotuned-fh-1-2"	"spset-sw-verif"	"spset-hw-bmc"
[7] "sp-var-dec-heur"	"sp-learned-clause-sort-heur"	"sp-orig-clause-sort-heur"
[10] "sp-res-order-heur"	"sp-clause-del-heur"	"sp-phase-dec-heur"
[13] "sp-resolution"	"sp-use-pure-literal-rule"	"solving-time-amazon-nano-2-7-10286"

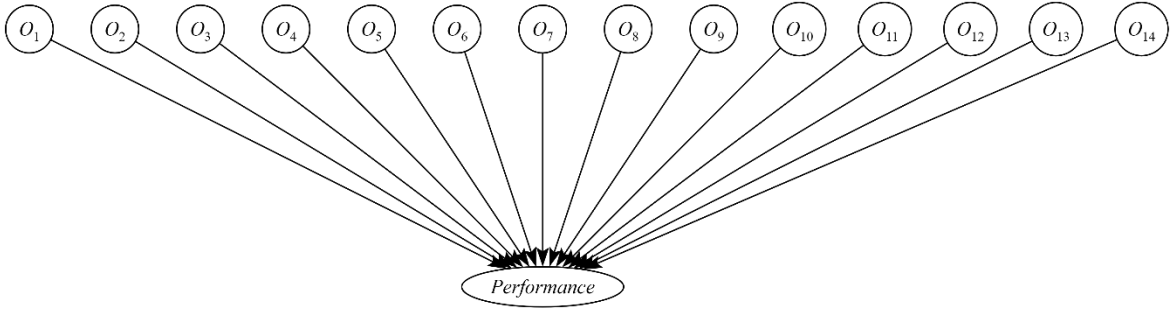


# SPEAR14-10

[1] "spset-old-default"	"spset-autotuned-fh-1-0"	"spset-autotuned-fh-1-1"
[4] "spset-autotuned-fh-1-2"	"spset-sw-verif"	"spset-hw-bmc"
[7] "sp-var-dec-heur"	"sp-learned-clause-sort-heur"	"sp-orig-clause-sort-heur"
[10] "sp-res-order-heur"	"sp-clause-del-heur"	"sp-phase-dec-heur"
[13] "sp-resolution"	"sp-use-pure-literal-rule"	"solving-time-feature20-2-7-10286"



# Identifiability



1

$$P^*_{O_1}(Performance) = P^*(Performance|O_1)$$



Load

Estimation

Derivation

Remove

Derivation in Do Calculus

Expand All Collapse All

$$\vdash P^*_{O_1}(Performance)$$

$$P^*(Performance|O_1)$$

Rule 2:  $(O_i \perp Performance)_{G_{O_i}}$

(1)

(2)

Finally we get:  $P^*(Performance|O_1)$

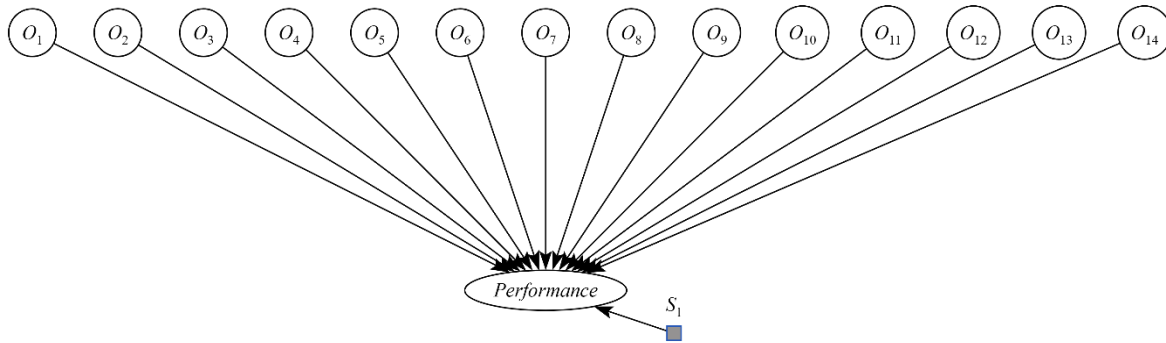
Subgraph:

G

Show non active nodes/edges



## Transportability



1

$$I^*_{O_1}(Performance) = I^*(Performance|O_1)$$



Load

Derivation

Remove

Derivation in **Do-Calculus**

Expand All Collapse All

$\vdash I^*_{O_1}(Performance)$  (1)

$I^*(Performance|O_1)$

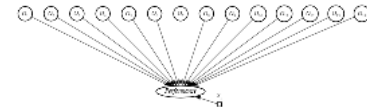
Rule 2:  $(O_1 \perp Performance)_{G_{O_1}}$  (2)

Finally we get:  $I^*(Performance|O_1)$

Subgraph:

$G$

☐ Show non active nodes/edges



☐