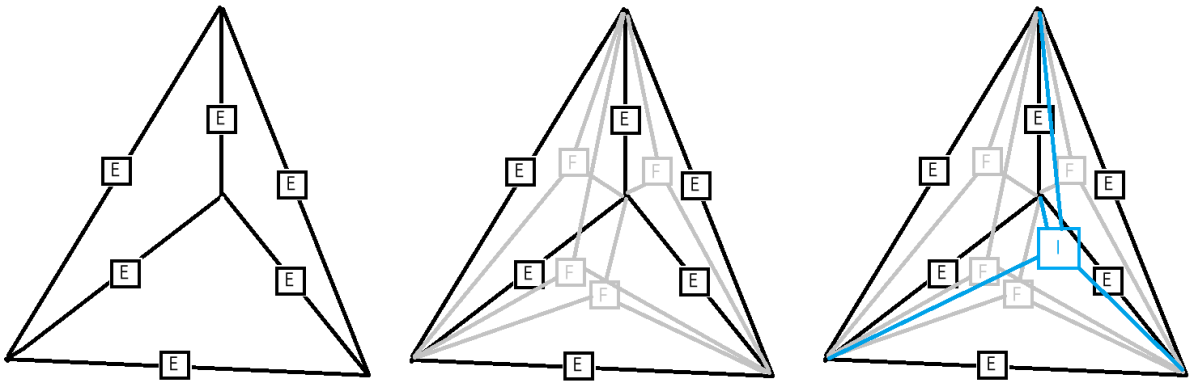
Projekt: Symulacje procesów ciągłych i algorytmy adaptacyjne 2020 Maciej Paszyński (c)

Dana jest następujące struktura hipergrafu reprezentująca element czworościenny

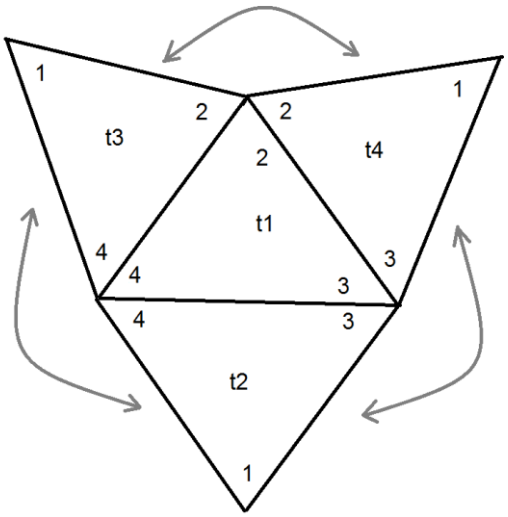


Mamy wierzchołki grafu, 6 hiperkrawędzi z etykietą E reprezentujące krawędzie elementu, 4 hiperkrawędzie z etykietą F reprezentujące 4 ściany elementu, oraz 1 hiperkrawędź z etykietą I reprezentującą wnętrze czworościanu.

W przygotowanej strukturze danych hipergrafowej w JAVA proszę zaimplementować łamania ścian tak jak w podanym wzorze. Proszę zwizualizować złamane ściany. Następnie, proszę domknąć wnętrze generując odpowiednie ściany i wnętrza wewnątrz hipergrafu.

Istniejące wcześniej hiperkrawędzie reprezentujące ściany i wnętrze trzeba usunąć, jeśli dana ściana lub wnętrze jest modyfikowane. Proszę zwizualizować cały hipergraf połamanego czworościanu.

Kod transformacji oznacza sposób łamania czterech ścian czworościanu, zgodnie ze schematem

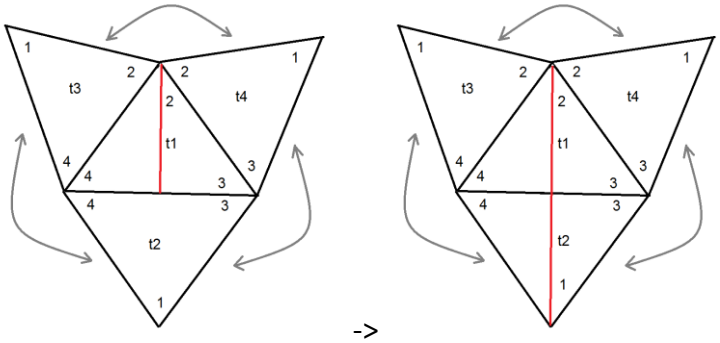


* oznacza konieczność wykonania dodatkowych łamań, tak żeby usunąć tzw. wiszące węzły (hanging nodes)

List of the 50-19=31 transformations

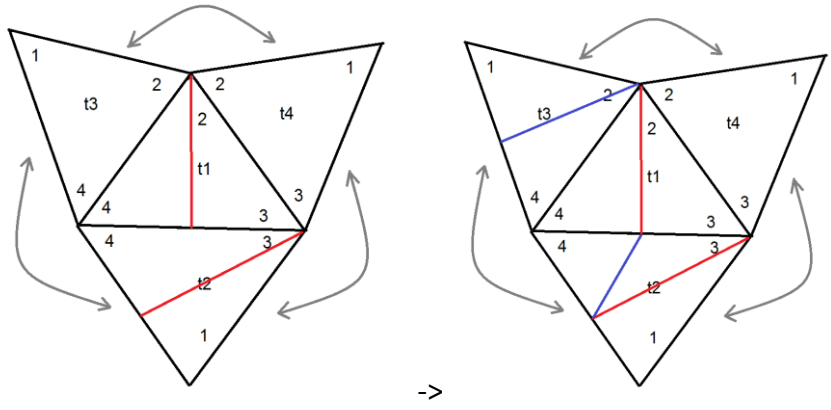
a) One refinement on the input, where the triangle t2 has the longest edge common with t1

(P1) 2000->2100

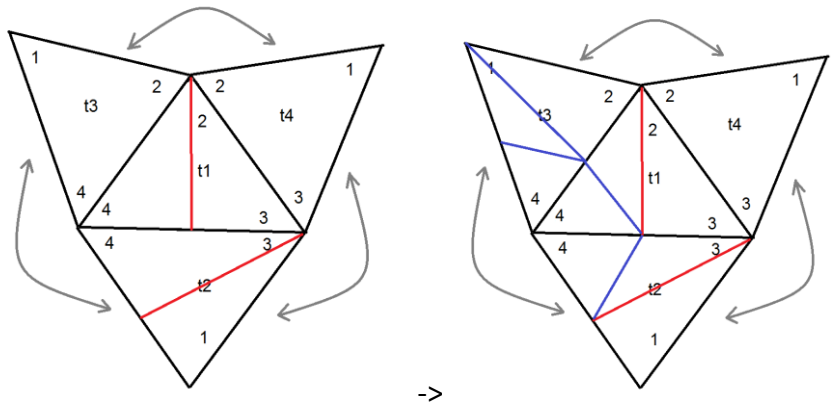


b) One refinement on the input, where the triangle t2 has the longest edge not common with t1

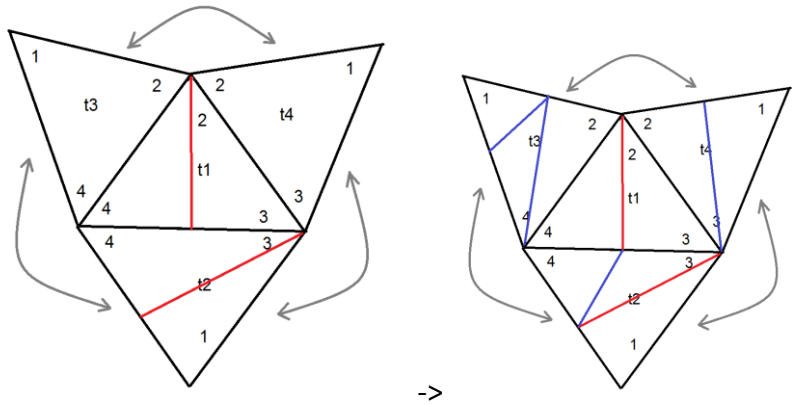
(P2) 2300 -> 2320* (extra refinement of t3 of type 2)



(P3) 2300 -> 2310* (extra refinement of t3 of type 1)



(P4) 2300 -> 2343* (extra refinement of t3 of type 4, extra refiement of t4 of type 3



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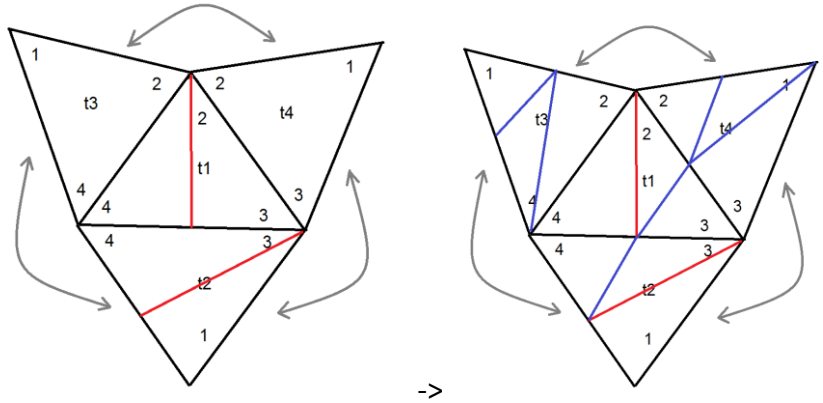
(P5) 2300 -> 2341* (extra refinement of t3 of type 4, extra refiement of t4 of type 1)



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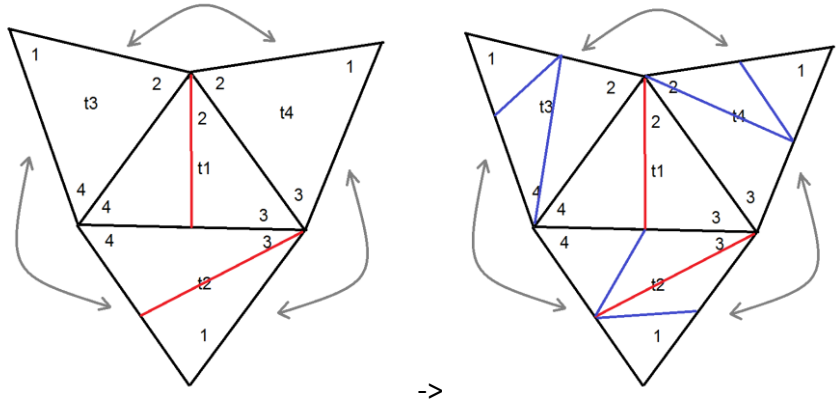
(P6) 2300 -> 2342* (extra refinement of t3 of type 4, extra refiement of t4 of type 2)



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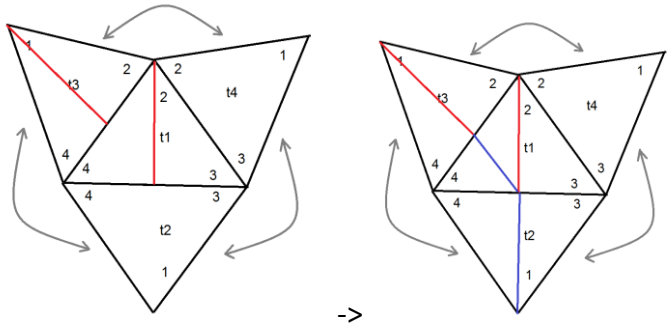
2. Two refinements of faces

a) refinement t1 of type 2 and other symmetric refinements of t2 has been already considered in point 1

b) refinement t1 of type 2 and refinement t3 of type 1

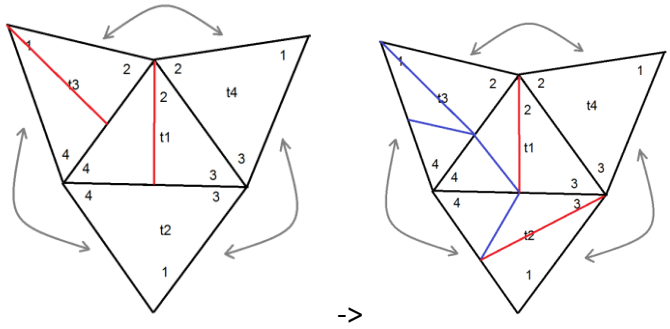
(plus refinement of t2 of type 1)

(P7) 2010 -> 2110*



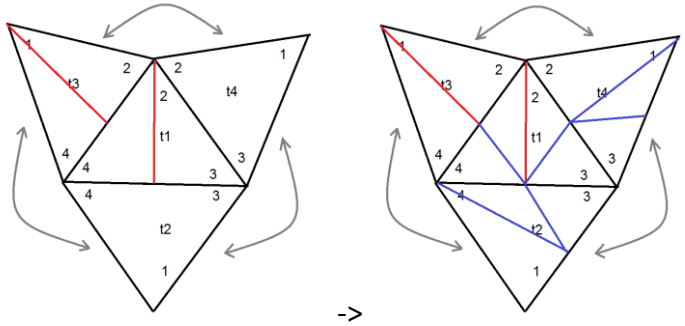
(P8) 2010 -> 2310* (=P3)

(plus refinement of t2 of type 3)



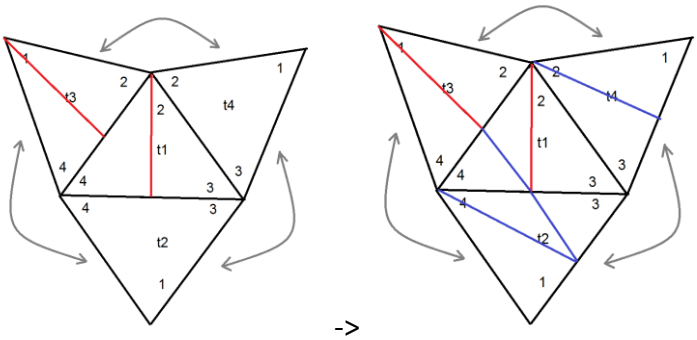
(P9) 2010 -> 2411*

(plus refinement of t2 of type 4 and refinement of t4 of type 1)



(P10) 2010 -> 2412*

(plus refinement of t2 of type 4 and refinement of t4 of type 2)



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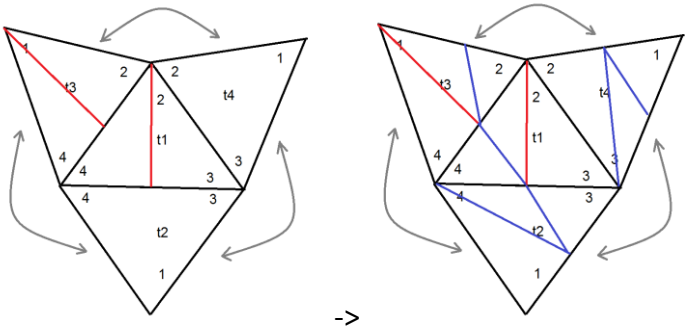
(P11) 2010 -> 2413*

(plus refinement of t2 of type 4 and refinement of t4 of type 3)



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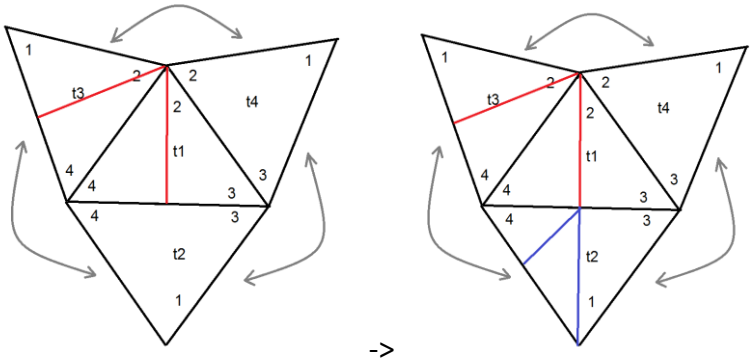
c) Refinement t1 of type 2 plus refinement t3 type 2

(plus refinement t2 of type 1)

(P12) 2020 ->2120*



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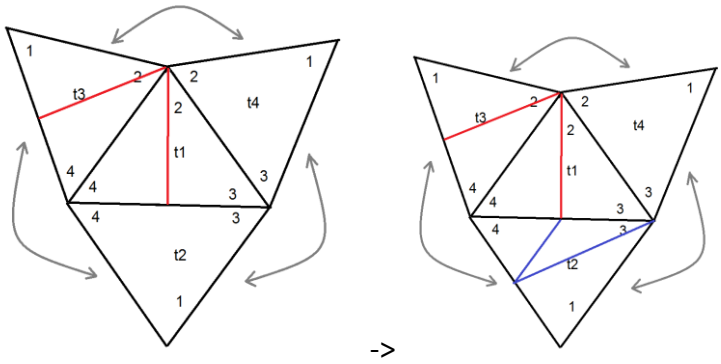
(plus refinement t2 of type 3)

(P13)= 2020 ->2320* = (P2)



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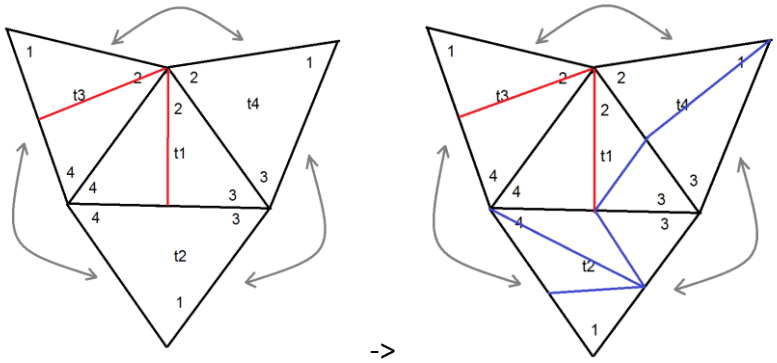
(plus refinement t2 of type 4 plus refinement of t4 type 1)

(P14) 2020 ->2421*



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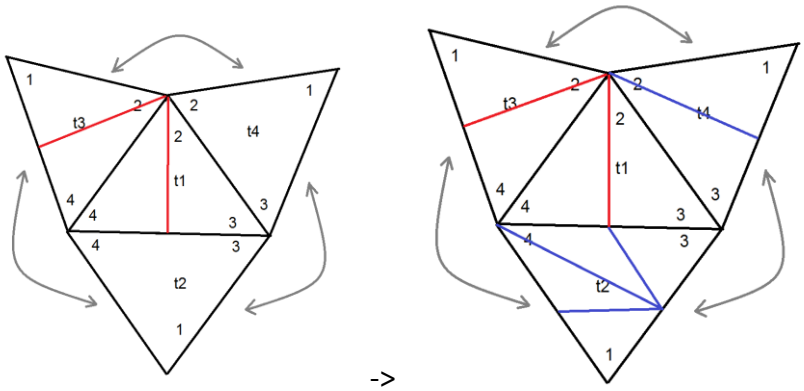
(plus refinement t2 of type 4 plus refinement of t4 type 2)

(P15) 2020 ->2422*



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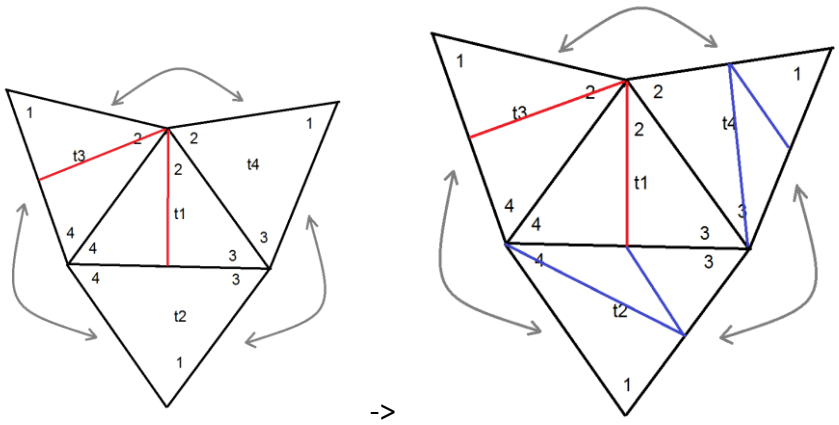
(plus refinement t2 of type 4 plus refinement of t4 type 3)

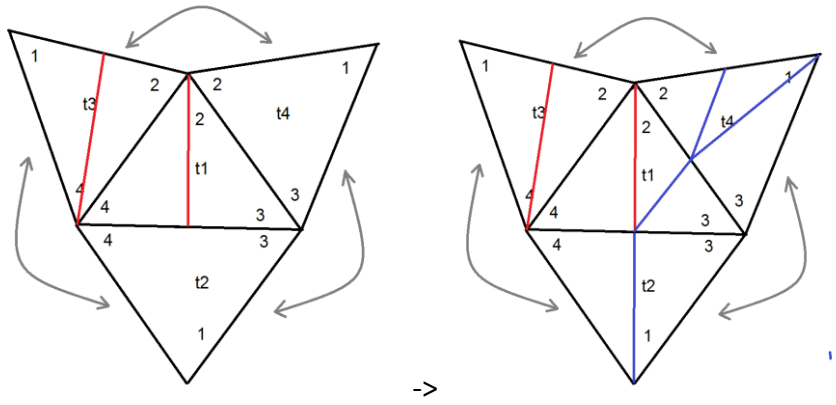
(P16) 2020 ->2423*



d) Refinement t1 type 2 plus refinement t3 type 4

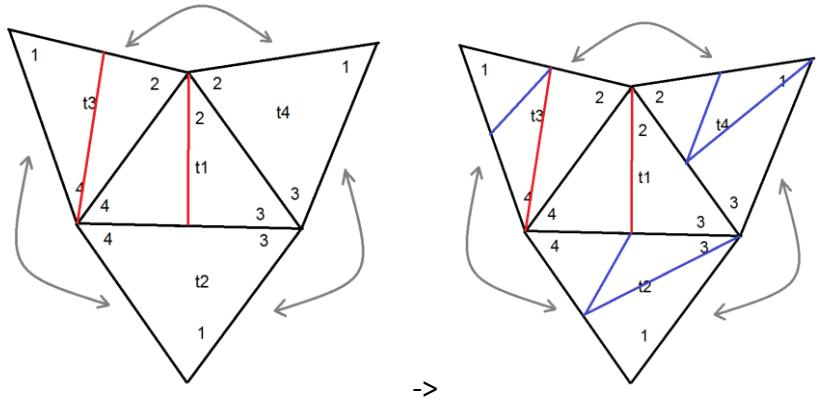
(plus refinemenet t4 of type 1 plus refinement t2 of type 1

(P17) 2040 ->2141*



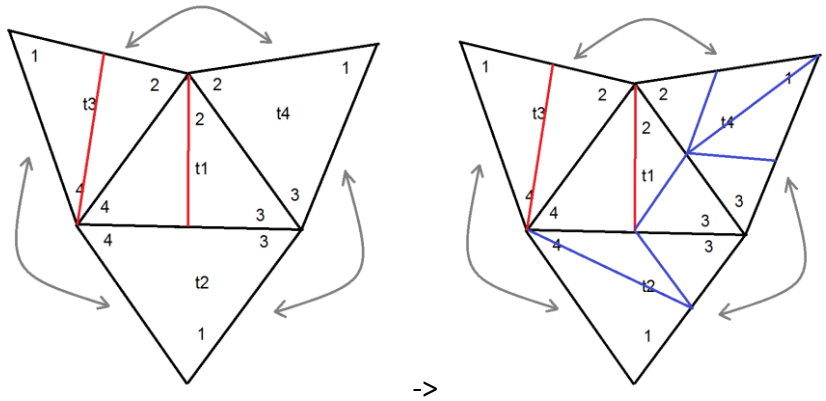
plus refinement t4 of type 1 plus refinement t2 of type 3

(P18) 2040 ->2241*



plus refinement t4 of type 1 plus refinement t2 of type 4

(P19) 2040 ->2441*



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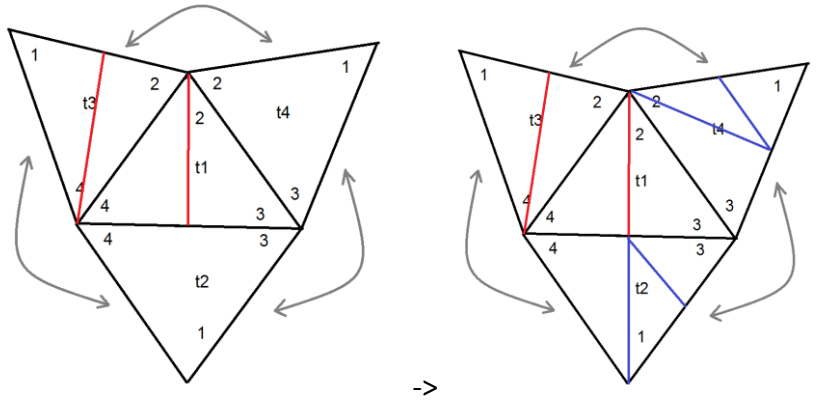
(P20) 2040 ->2142*

plus refinement t4 of type 2 plus refinement t2 of type 1



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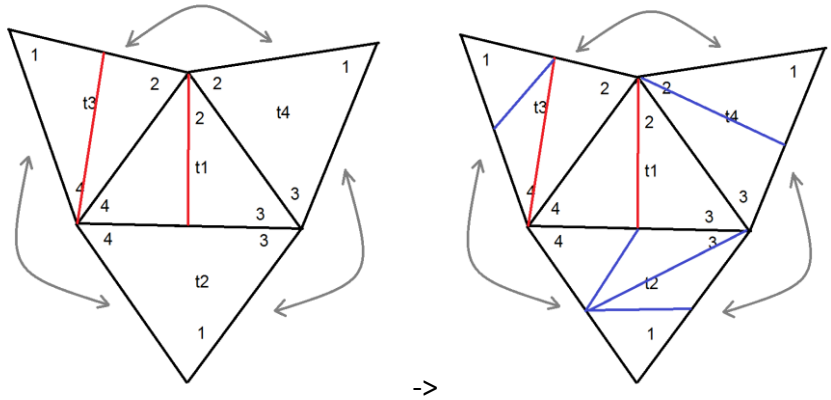
(P21) 2040 ->2342* =(P6)

plus refinement t4 of type 2 plus refinement t2 of type 3



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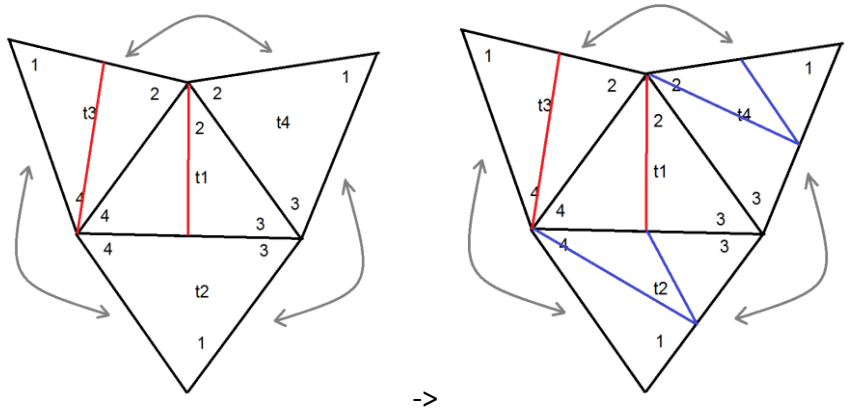
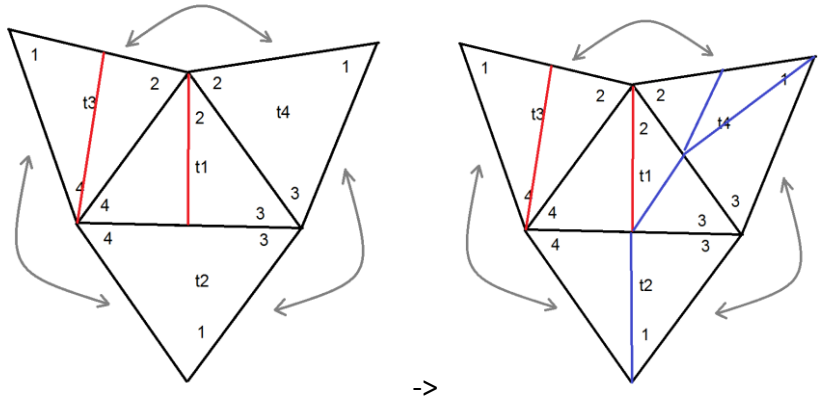
(P22) 2040 ->2442*

plus refinement t4 of type 2 plus refinement t2 of type 4



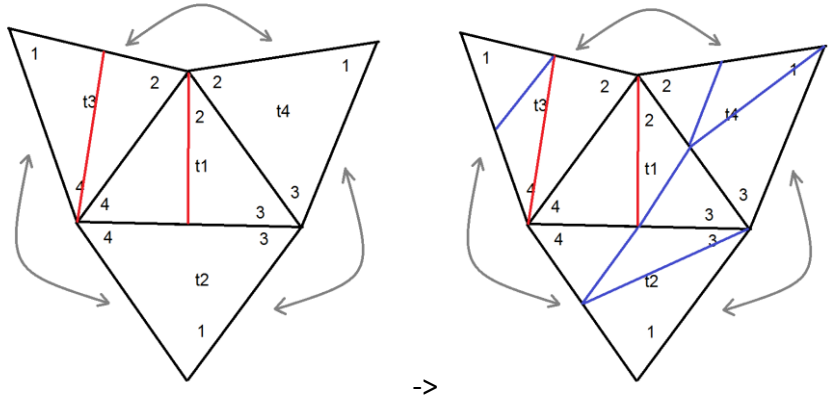
(P23) 2040 ->2141*=(P17)

plus refinement t4 of type 1 plus refinement t2 of type 1



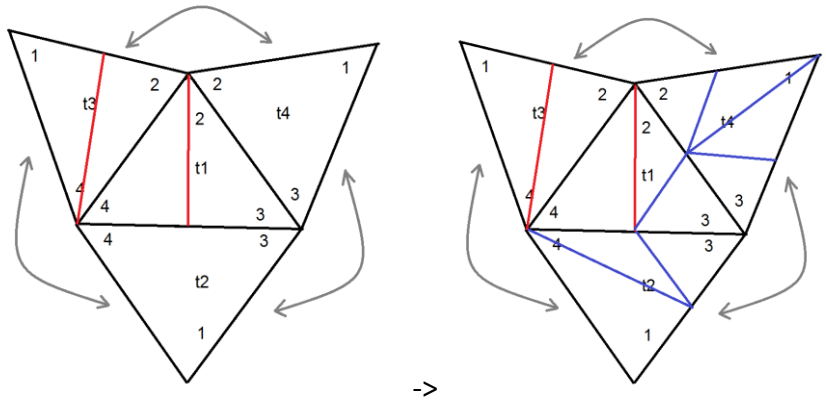
(P24) 2040 ->2341* =(P5)

plus refinement t4 of type 1 plus refinement t2 of type 3



(P25) 2040 ->2441*=(P19)

plus refinement t4 of type 1 plus refinement t2 of type 4



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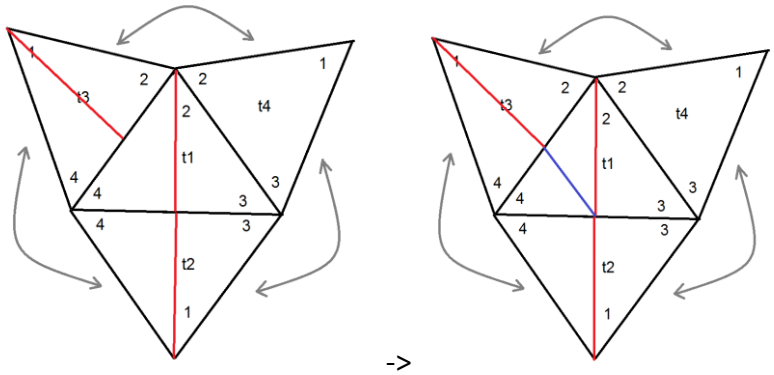
3. Three refinements on the input

(P26) 2110->2110*=(P7)



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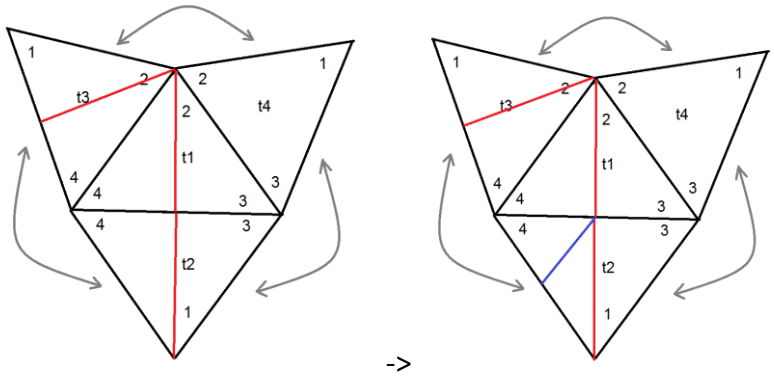
(P27) 2120->2120*=(P12)



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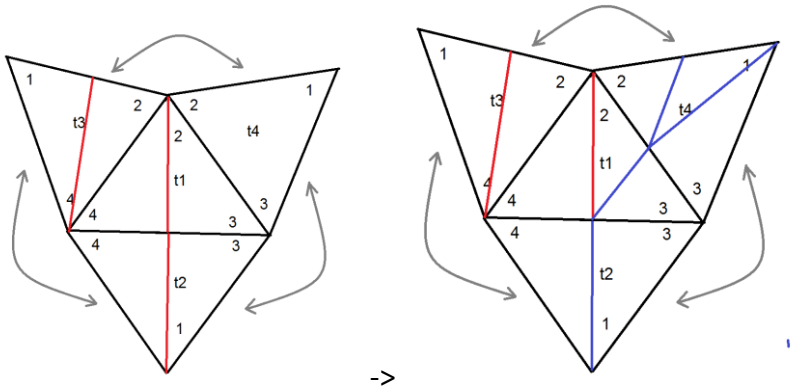
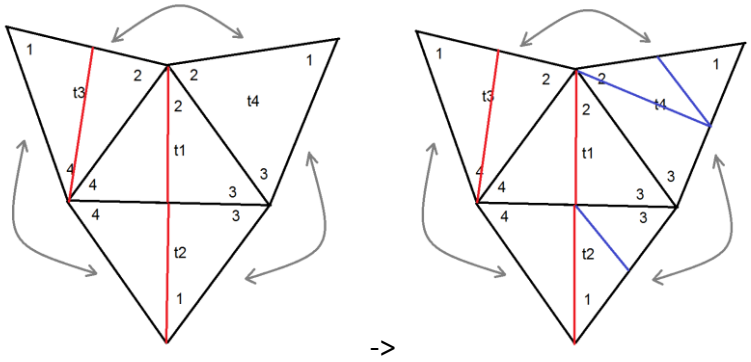
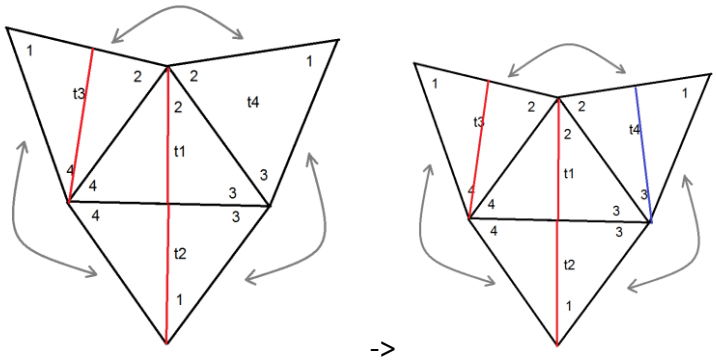
(P28) 2140-> 2141* (plus t4 code1) =(P17)



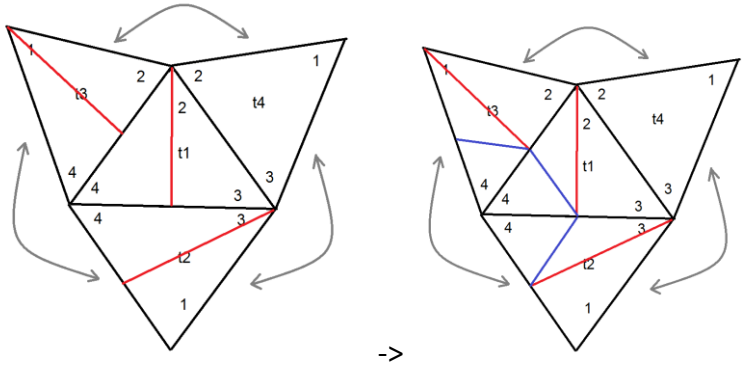
(P26) 2140-> 2142* (plus t4 code2) =(P20)



(P27) 2140-> 2143 (plus t4 code3)



(P28) 2310->2130*=(P3)



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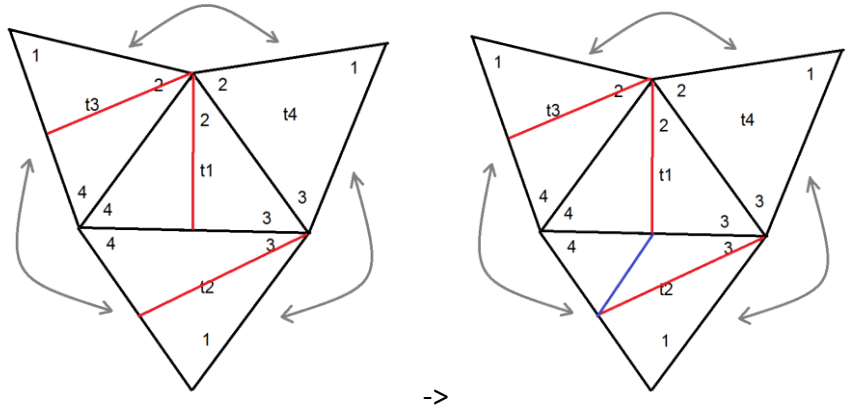
(P29) 2320->2320* =(P2)



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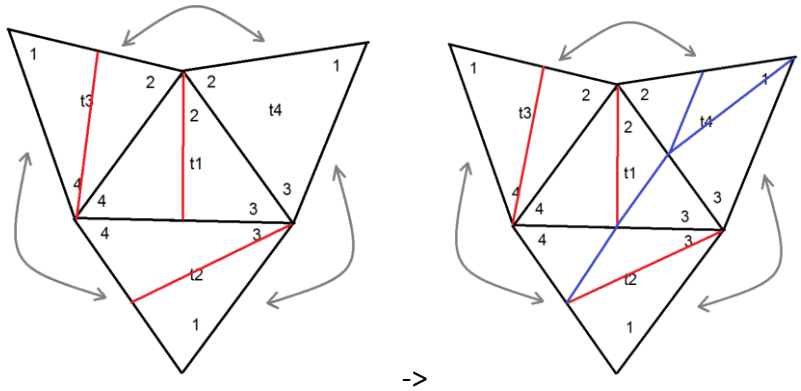
(P30) 2340 ->2341* (plus t4 code 1) =(P5)



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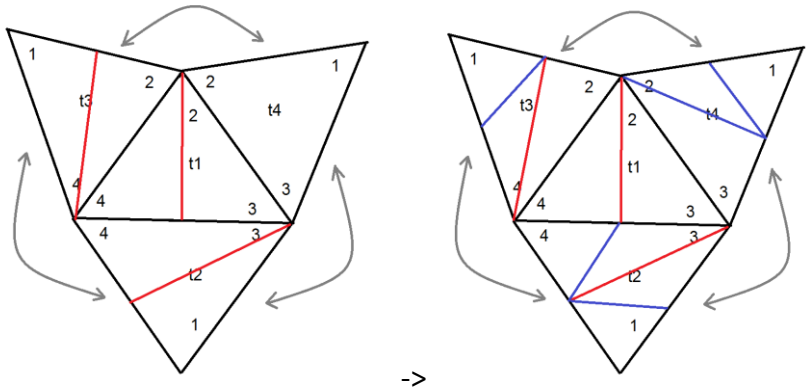
(P31) 2340 ->2342* (plus t4 code 2) =(P6)



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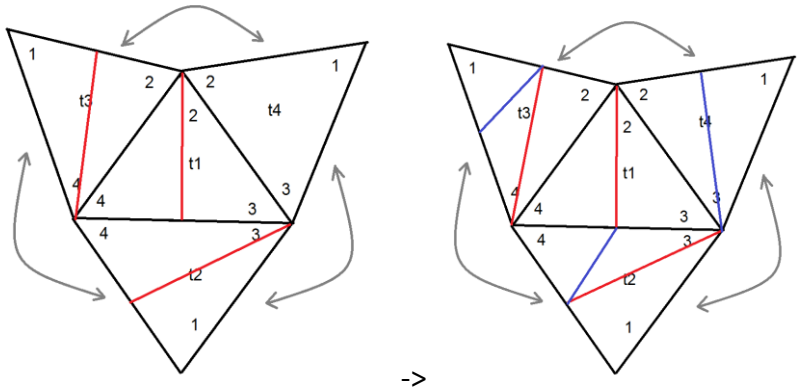
(P32) 2340 ->2343* (plus t4 code 3) =(P4)



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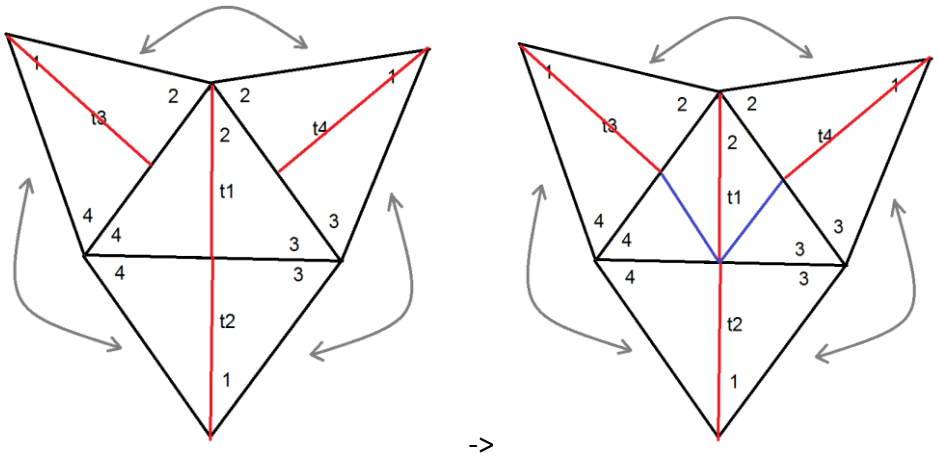
3. Four refinements and what follows

(P33) 2111->2111*



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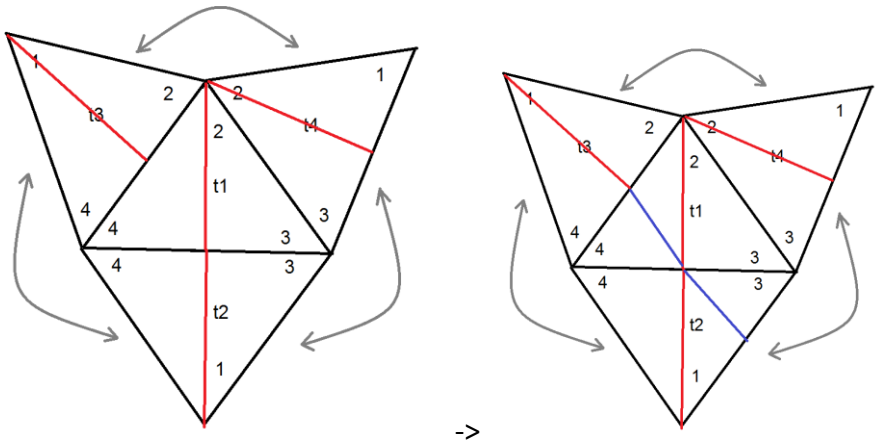
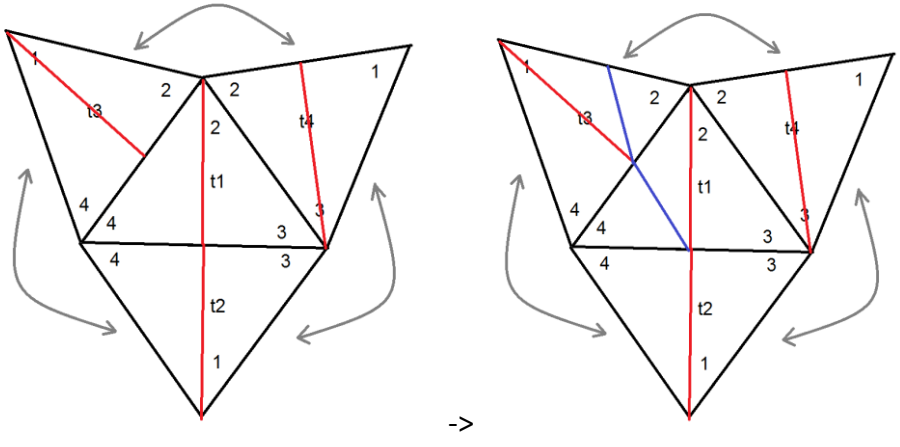
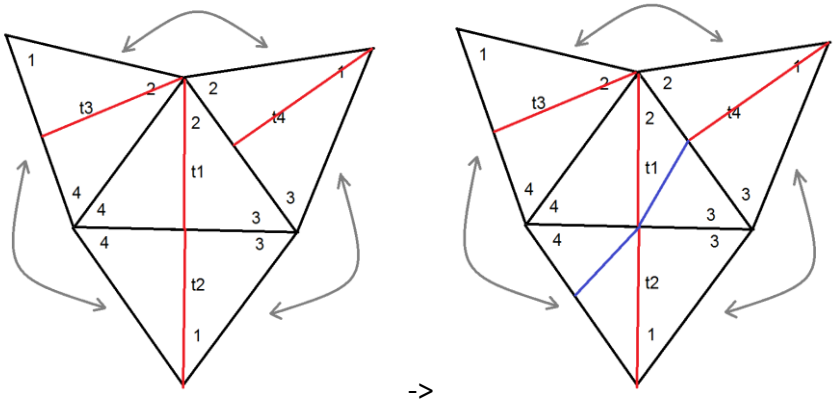
(P34) 2112->2112*



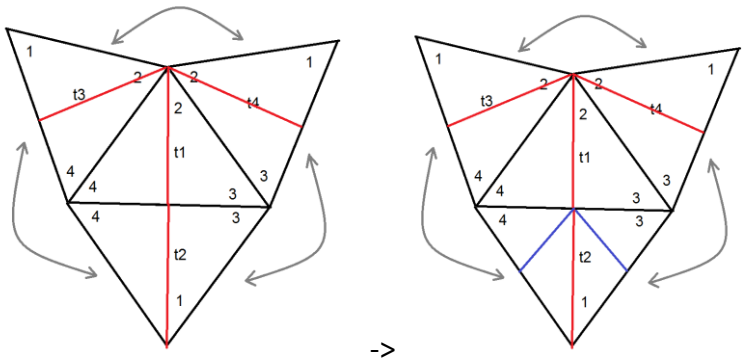
(P35) 2113->2113*



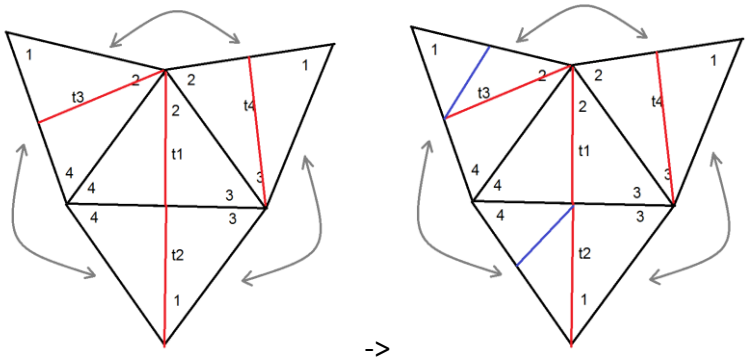
(P36) 2121->2121*



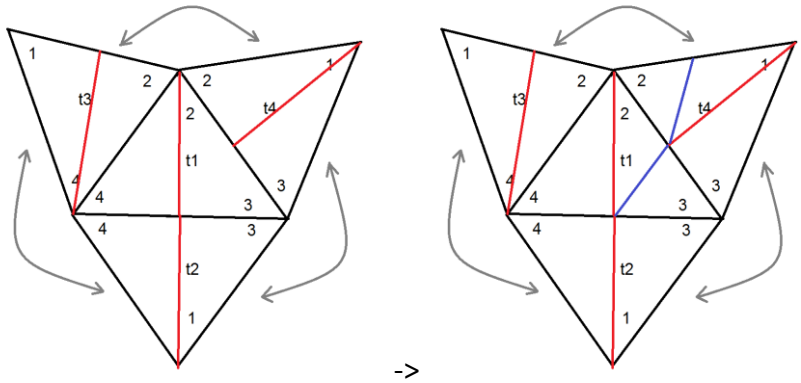
(P37) 2122->2122*



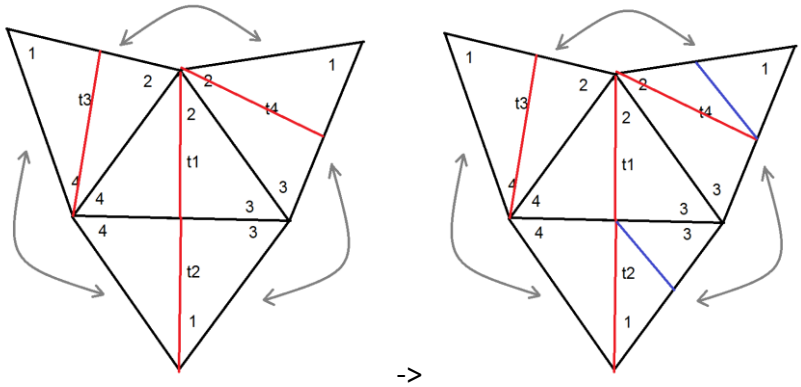
(P38) 2123->2123*



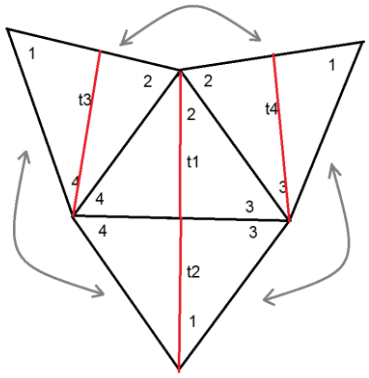
(P39) 2141->2141* =(P17)



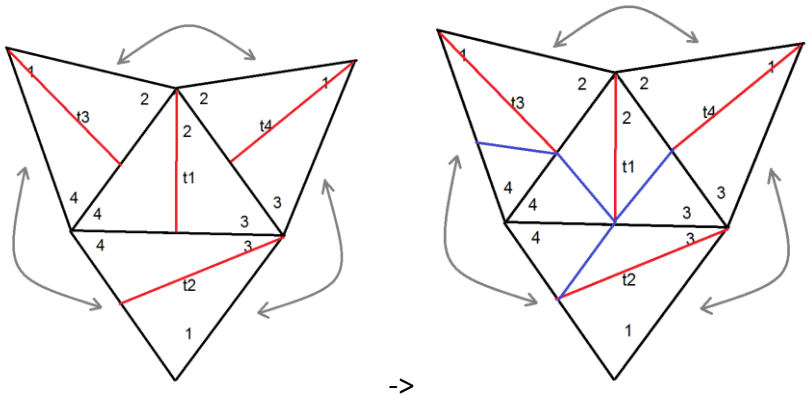
(P40) 2142->2142* =(P20)



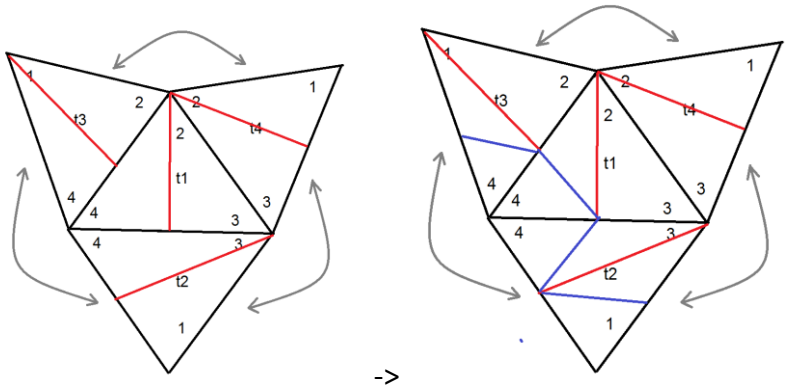
(P41) 2143-> 2143 =(P27)



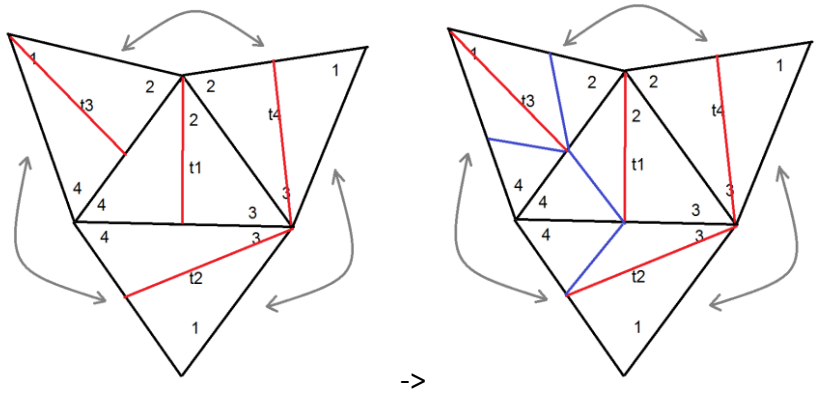
(P42) 2311->2311*



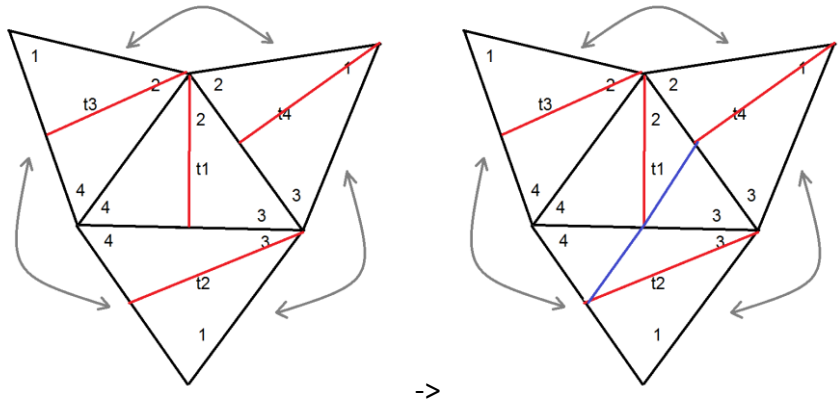
(P43) 2312->2132*



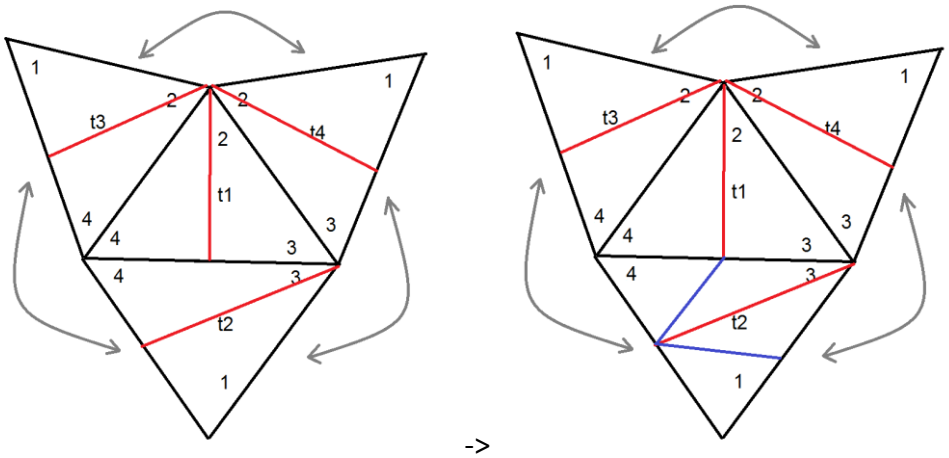
(P44) 2313->2313*



(P45) 2321->2321*



(P46) 2322->2322*



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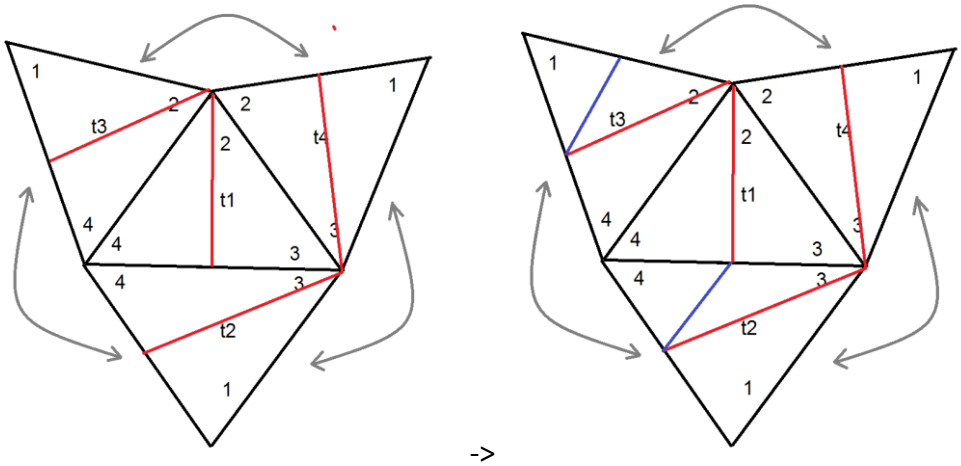
(P47) 2323->2323*



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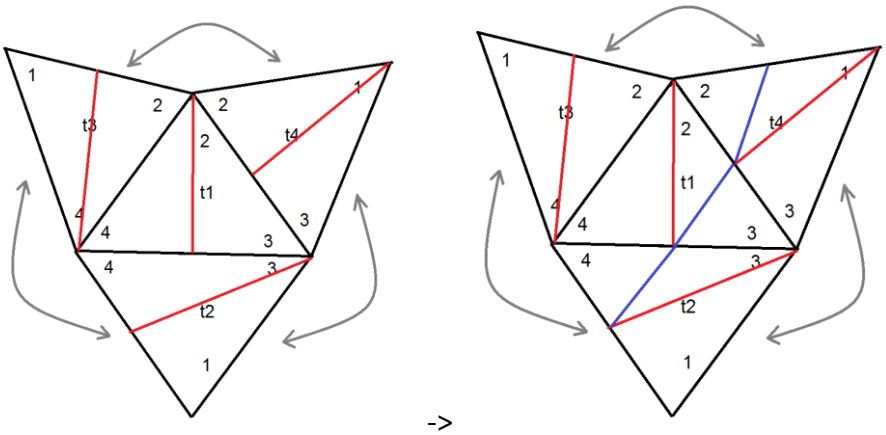
(P48) 2341->2341* =(P5)



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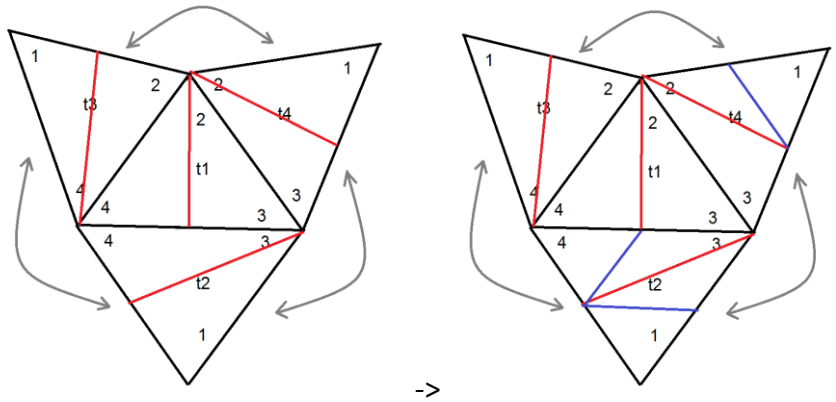
(P49) 2342->2342* =(P6)



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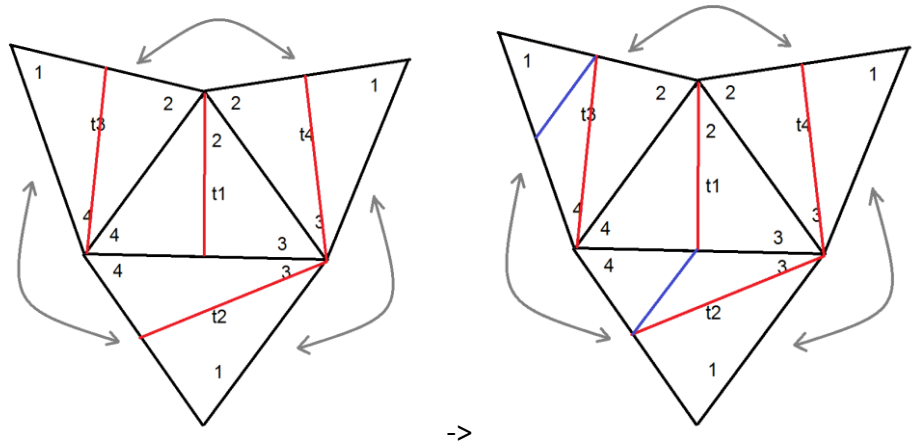
(P50) 2343->2343* =(P4)



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