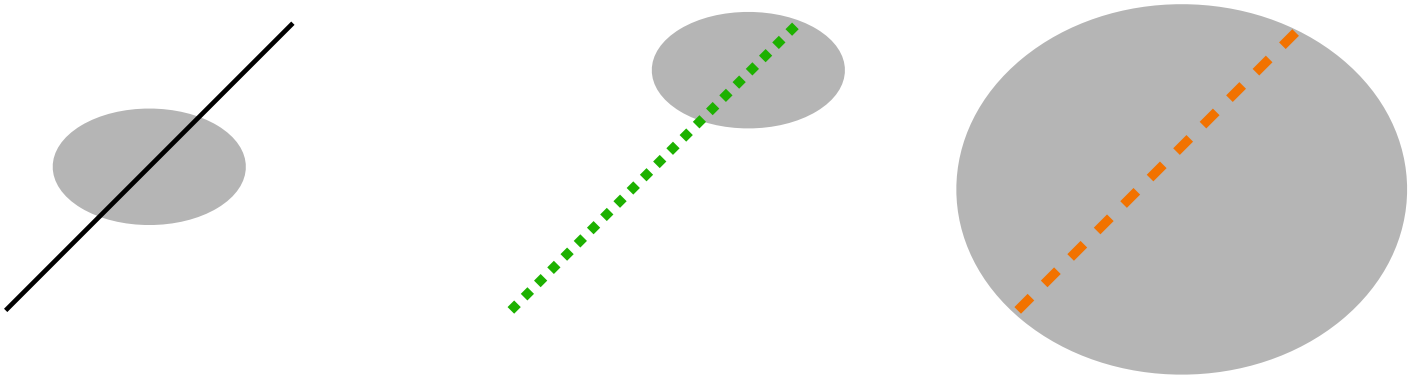
Artifact typology

Second draft

July 2024, simplification crew

Three types of edges:

CONTINUING (C) **ENDING (E)** **SINGLE (S)**



“Continuing”: continues before and after artifact

“Ending”: continues only at one end

“Single”: does not continue

Note: always assuming that the 3 artefact edges belong to 3 SEPARATE continuity groups. —> since this is not always the case, we need to adjust this…
(that’s also why case 8 is not represented in the typology, see 3-node artefict with case numbers slide)

x types of x-node artifacts

An artifact of x nodes can consist of **up to x** different continuity groups (“strokes”, aka “ways” from the COINS algorithm)

The number of continuity groups determines which combinations of edge types are possible for a given artifact.

Artifact classification code

First draft

We ask three questions:

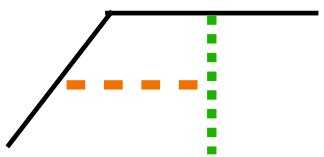
1. How many nodes does an artifact have?

2. How many strokes is it delineated by?

3. Do these strokes continue before and/or after the artifact?

The answer gives us a code:

`<X-node> <Y-continuity> <letter code>`, for example:



`4-node 3-continuity CES`

(This artifact has 4 nodes, is delineated by 3 strokes, of which one is continuous (C), another is ending (E), and the third one is single (S)

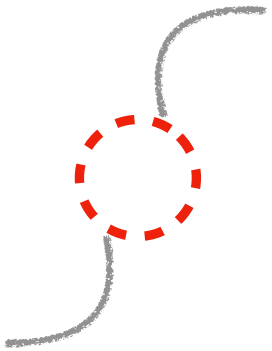
2-node artifacts with 1-continuity

1

C Tbd - I think this is not possible as defined by COINS algorithm

E Tbd - I think this is not possible as defined by COINS algorithm

S

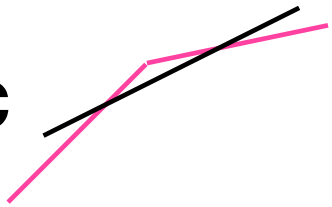


Case 8 from the triangle notebook :)

2-node artifacts with 2-continuity

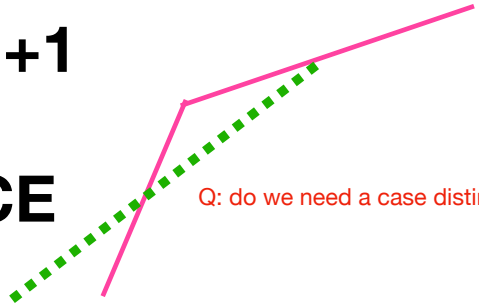
2

CC



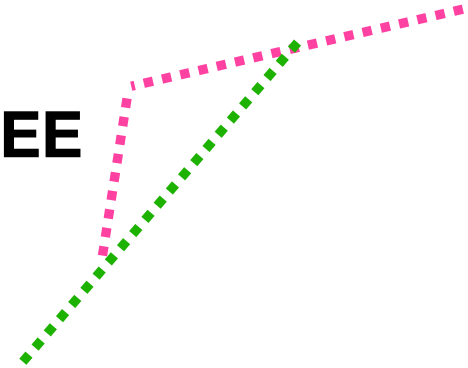
1+1

CE

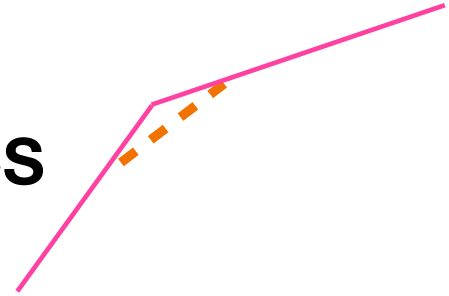


Q: do we need a case distinction (here and everywhere similar) re whether it is the C or the E edge that has the interior angle?

EE

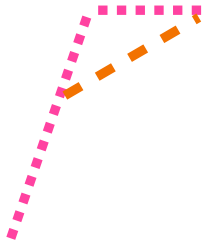


CS



SS

ES



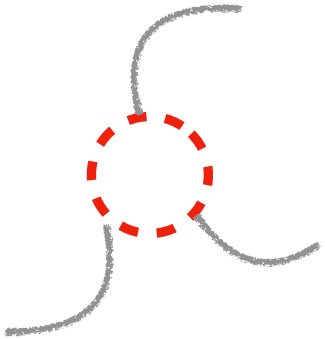
Note: these are the same cases as 3-node with 2-continuity, just without the grey strokes

3-node artifacts with 1-continuity

1

C Tbd - I think this is not possible as defined by COINS algorithm

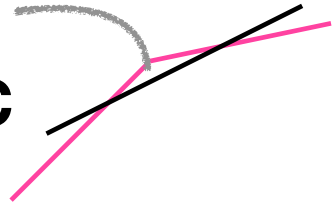
E Tbd - I think this is not possible as defined by COINS algorithm

S  Case 8 from the triangle notebook :)

3-node artifacts with 2-continuity

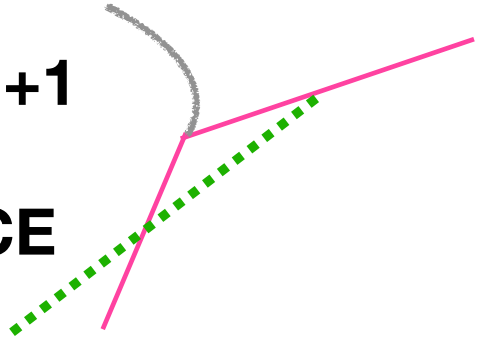
2

CC

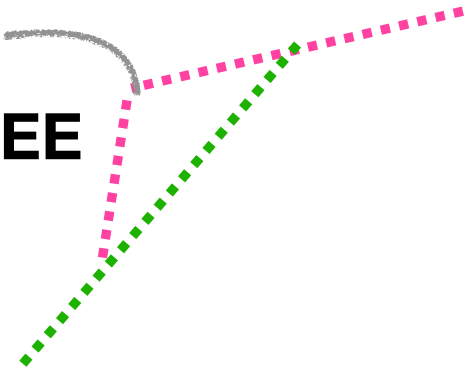


1+1

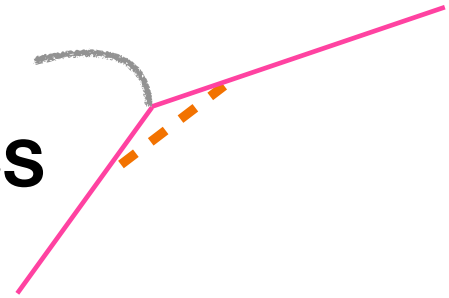
CE



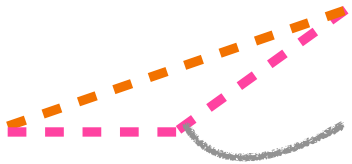
EE



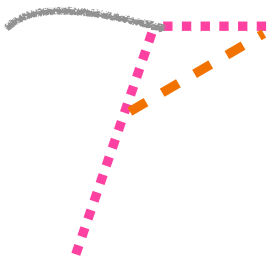
CS



SS



ES



2nd continuity group (that will depend on interior angle threshold!) in pink

"other" stuff which produces the additional nodes in grey

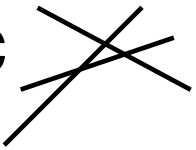
Q: do we need a case distinction (here and everywhere similar) re whether it is the C or the E edge that has the intersection with a further stroke ("additional" node)?

Note: these are the same cases as 2-node with 2-continuity, just with the grey strokes

3-node artifacts with 3-continuity

3

CCC

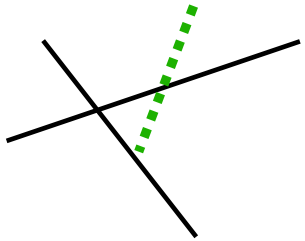


EEE

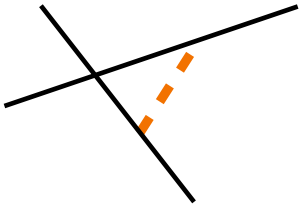
SSS

2+1

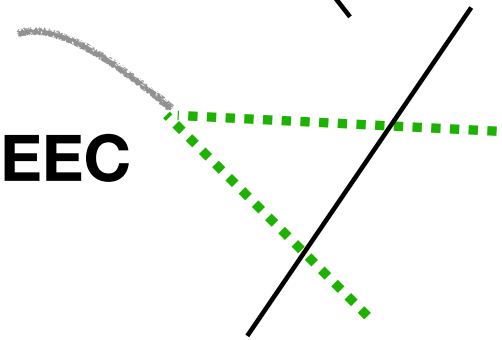
CCE



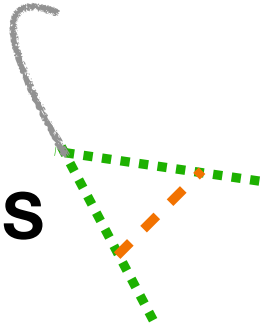
CCS



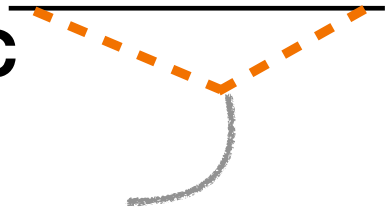
EEC



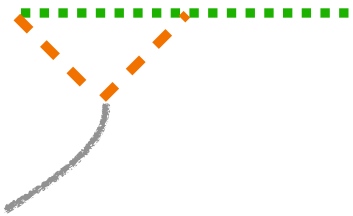
EES



SSC

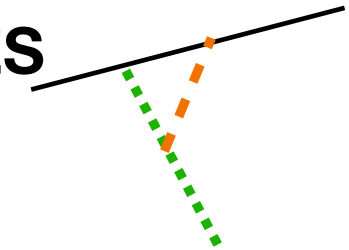


SSE



1+1+1

CES



THAT WHICH MAKES MY BRAIN HURT:

I think each of the cases here could be one of the following 3:

* the additional grey stroke is NEEDED
* The additional grey stroke is IMPOSSIBLE
* The additional grey stroke is OPTIONAL

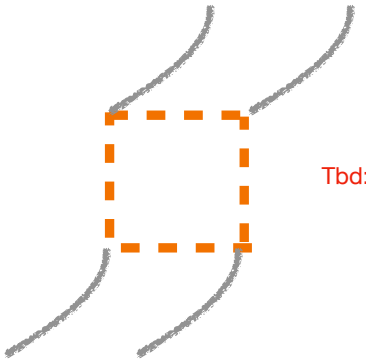
4-node artifacts with 1-continuity

1

C Tbd - I think this is not possible as defined by COINS algorithm

E Tbd - I think this is not possible as defined by COINS algorithm

S



Tbd: is this even possible with an angle threshold over 90deg..?

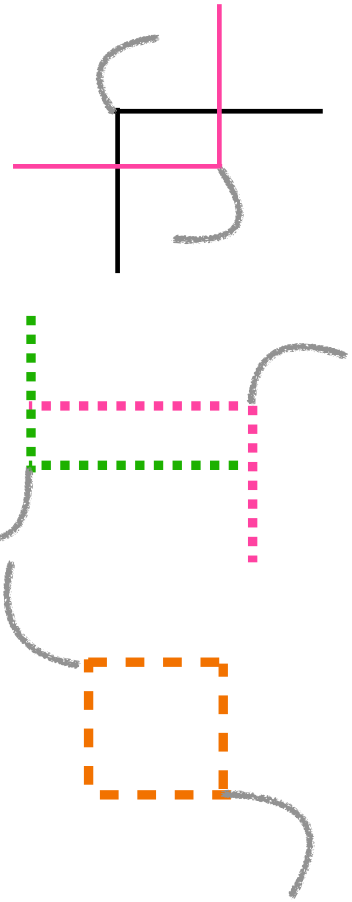
4-node artifacts with 2-continuity

2

CC

EE

SS

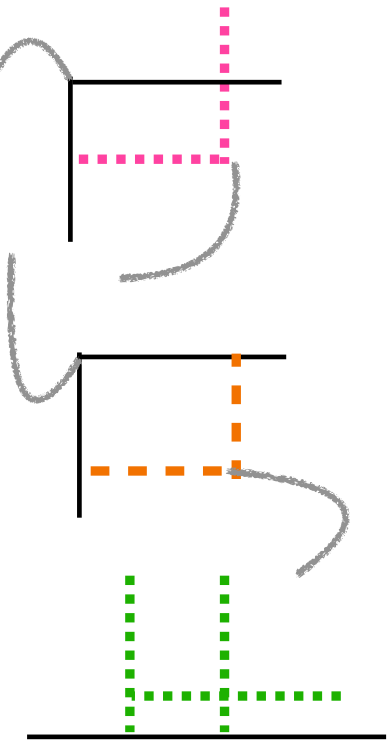


1+1

CE

CS

ES



2nd continuity group in pink

"other" stuff which produces the additional nodes in grey

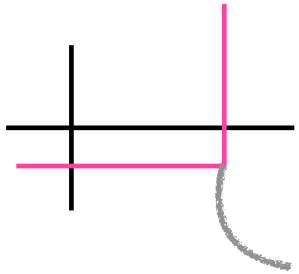
3nd continuity group in pink

"other" stuff which produces the additional (4th) node in grey

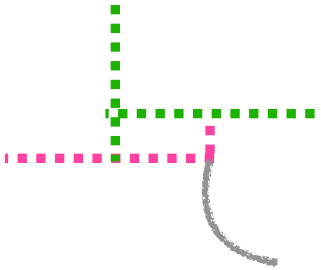
4-node artifacts with 3-continuity

3

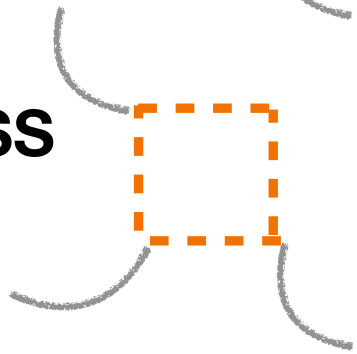
CCC



EEE

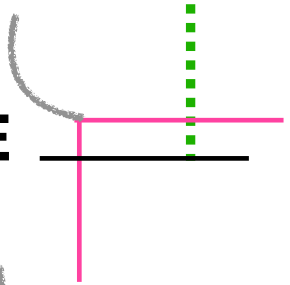


SSS

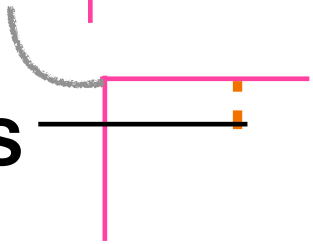


2+1

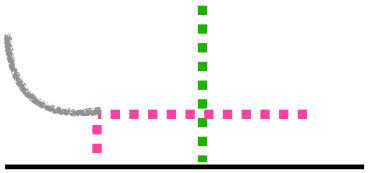
CCE



CCS

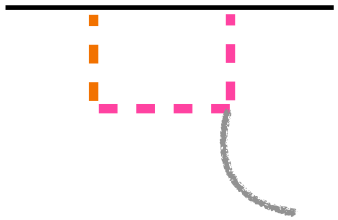


EEC

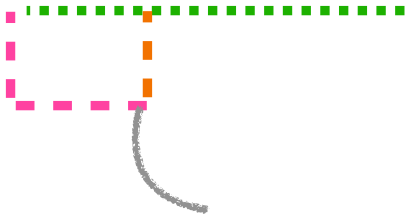


EES

SSC

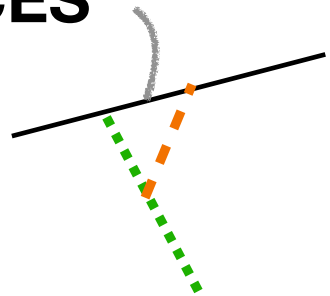


SSE



1+1+1

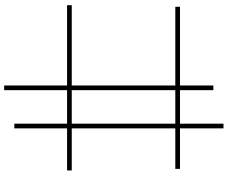
CES



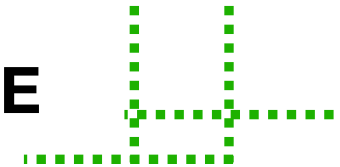
4-node artifacts with 4-continuity, pt 1

4

CCCC



EEEE

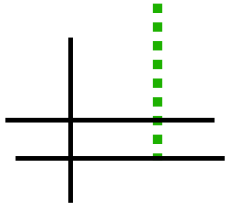


SSSS

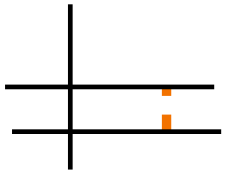
* We don't expect this case (would be an isolated network component)

3+1

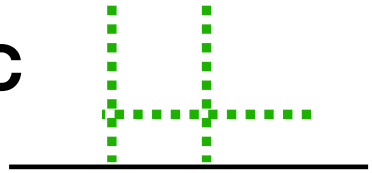
CCCE



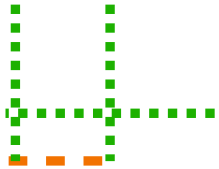
CCCS



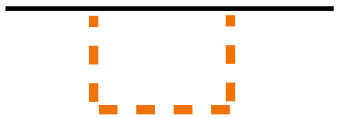
EEEC



EEES



SSSC

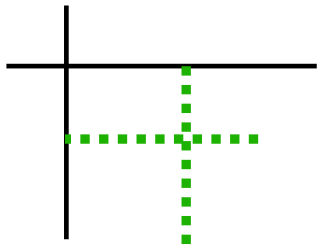


SSSE

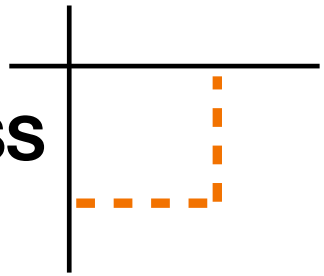
4-node artifacts with 4-continuity, pt 2

2+2

CCEE

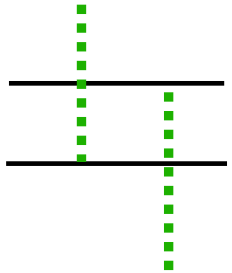


CCSS



EESS

CECE



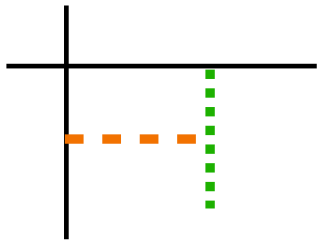
CSCS

ESES

Note the “index symmetry”:
CCEE = ECCE = EECC;
CECE = ECEC

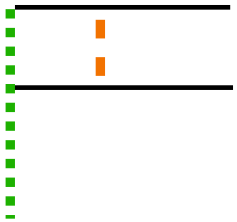
4-node artifacts with 4-continuity, pt 3

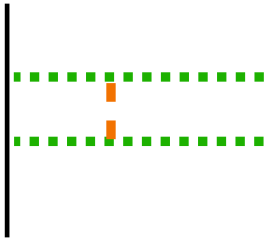
2+1+1

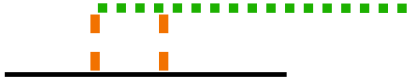
CCES 

EECS 

SSEC 

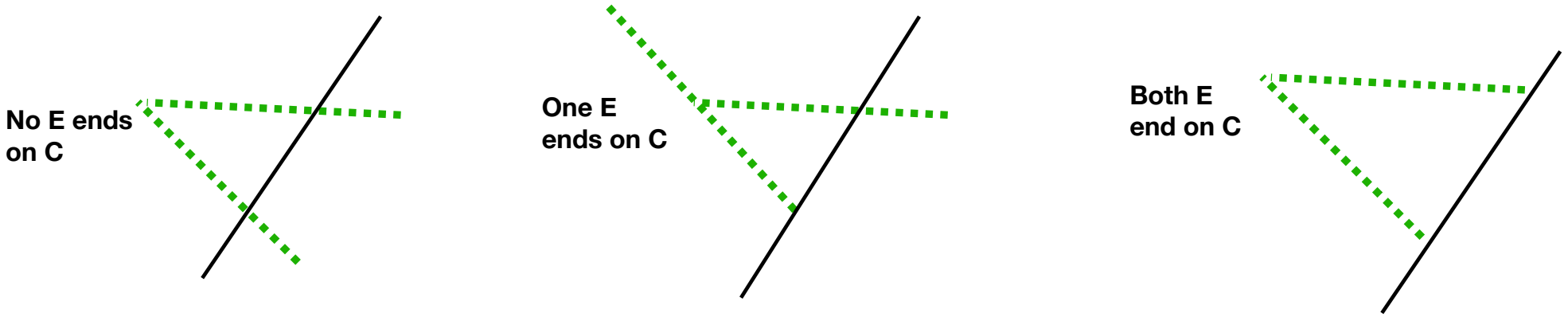
CECS 

ECES 

SESC 

TBD: Distinction at solution level?

Example for 3-node EEC: 3 cases, 3 different solutions



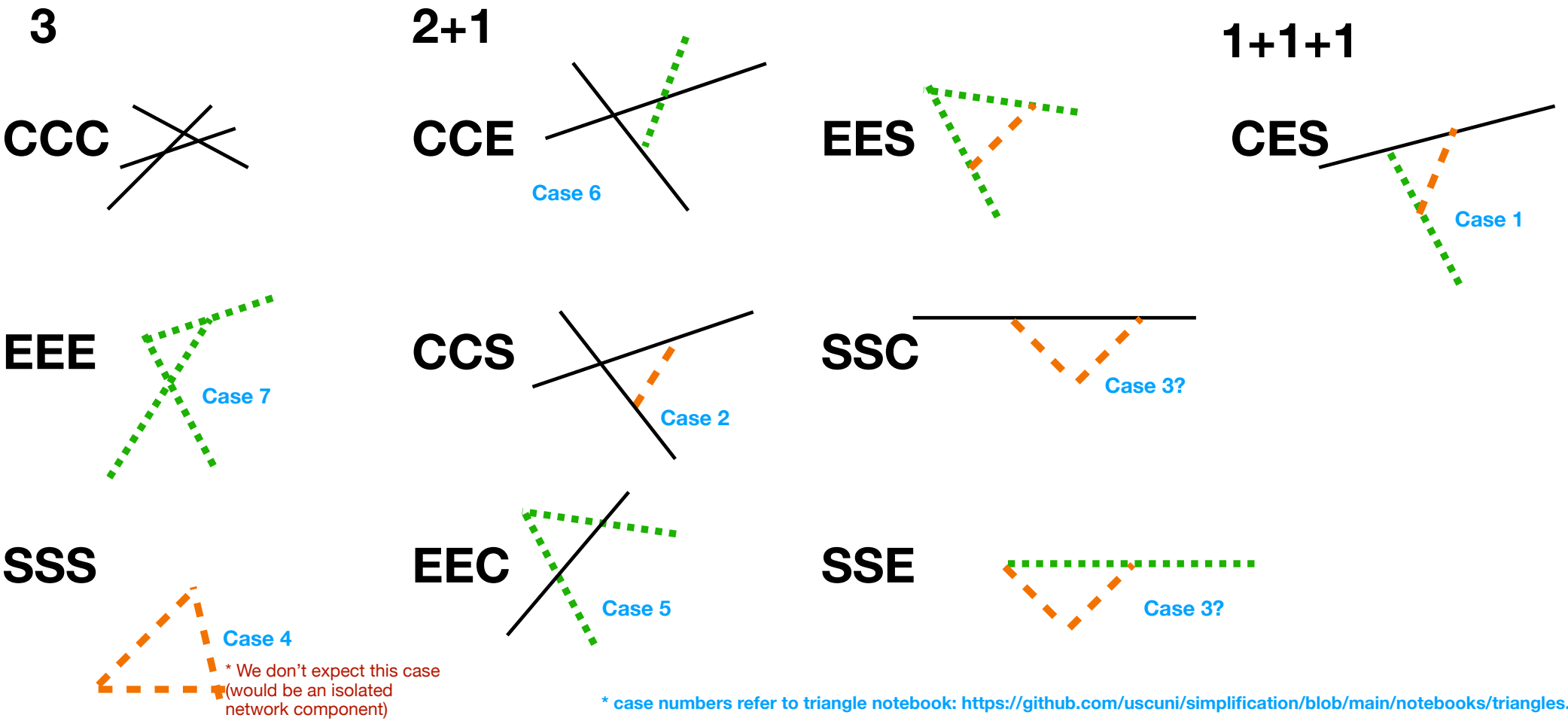
5-node artifacts (in progress)

5	4+1	3+2	3+1+1	2+2+1
CCCCC	CCCCE	CCCEE	CCCES	CCEES
EEEEE	CCCCS	CCCSS	EEECS	CCSSE
SSSSS			SSSCE	SSEEC
	EEEEC	EEECC		
	EEEES	EEESS		
	SSSSC	SSSCC		
	SSSSE	SSSEE		

Q (to be discussed / explored): what kind of symmetries do we need to account for here? e.g. are these two to be treated the same:

CCSSE v. CSCSE

3-node artifacts with case numbers (outdated)



* case numbers refer to triangle notebook: https://github.com/uscuni/simplification/blob/main/notebooks/triangles.ipynb