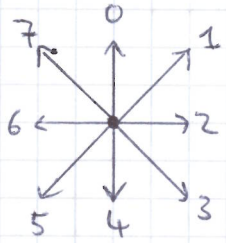
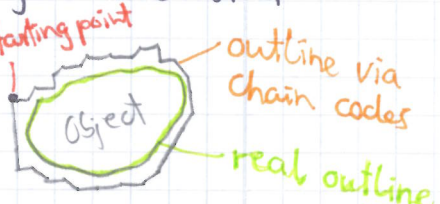
Chain Codes

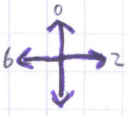
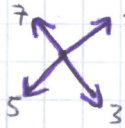
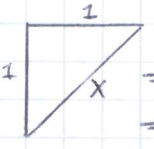
- After an image was processed by CCA, chain codes can help us find interesting properties of the connected components.
- These include: <u>outline</u>, <u>perimeter</u> and <u>area</u>
- We move around the object's edge (its "<u>outline</u>") using this thing:



- Depending on which arrow we take, we do a different computation.
- We trace the entire outline of an object and start and finish on the same pixel.



<u>Computing perimeter with chain codes</u>

We can compute the perimeter of an object (i.e the <u>length of its outline</u>) by realising that the chain codes with even numbers (that is 0, 2, 4 and 6. These guys: ) add <u>one pixel length</u> to the total perimeter, and the odd one's () add $\sqrt{2}$ because 

$\Rightarrow x^2 = 1^2 + 1^2$

$\Rightarrow x = \sqrt{2}$

Note:
We normally assume pixel length = 1

So perimeter length = number of even chain code steps * pixel length
$+ \sqrt{2}$ * number of odd chain code steps * pixel length

<u>Computing area with chain codes</u>

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