Pooling

Introduction to Pooling

- Pooling layer in CNN reduces dimensionality
- Makes computations easier
- Faster training
- Common Pooling techniques -
    - Max Pooling
    - Average Pooling

How Pooling Works?

5	4	4	7
7	6	6	10
9	5	6	8
7	6	1	5

2-D Input Image

How Pooling Works?

5	4	4	7
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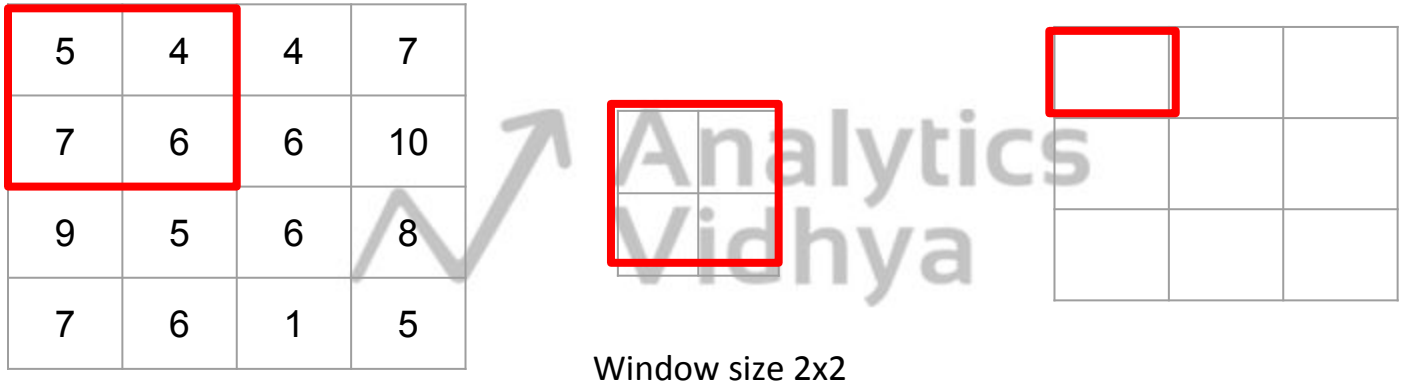
2-D Input Image

Window size 2x2

How Pooling Works?



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2-D Input Image

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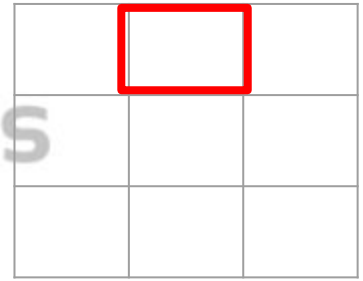

How Pooling Works?

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2-D Input Image

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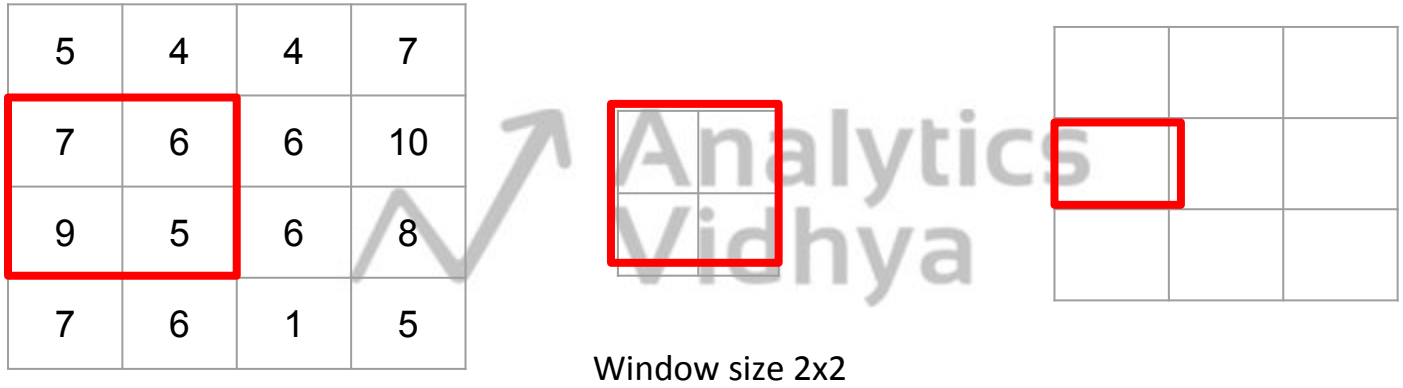

Window size 2x2

2-D Input Image

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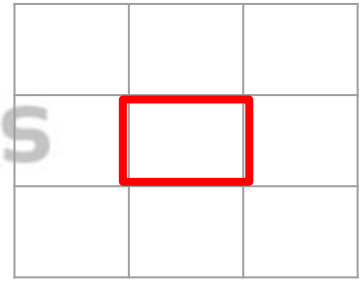

How Pooling Works?

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2-D Input Image

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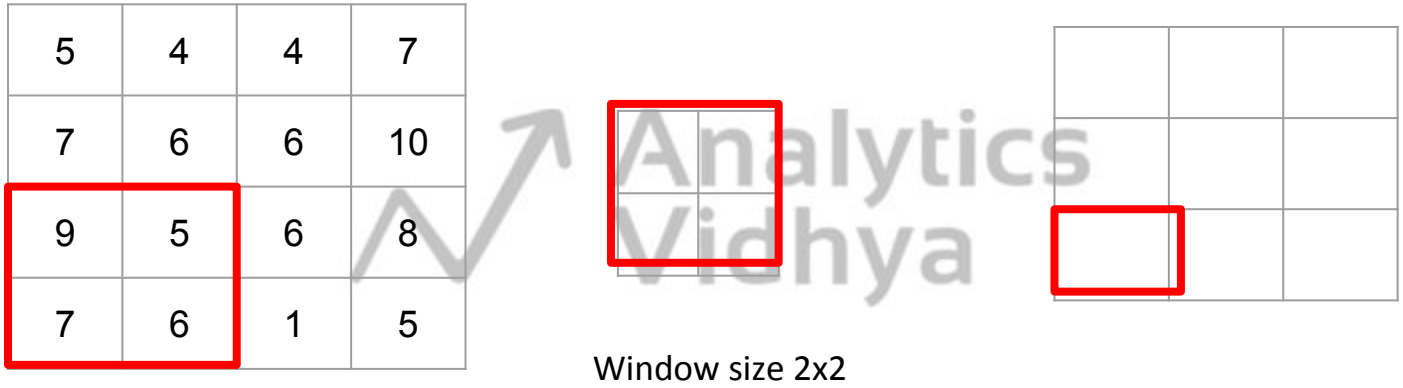

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2-D Input Image

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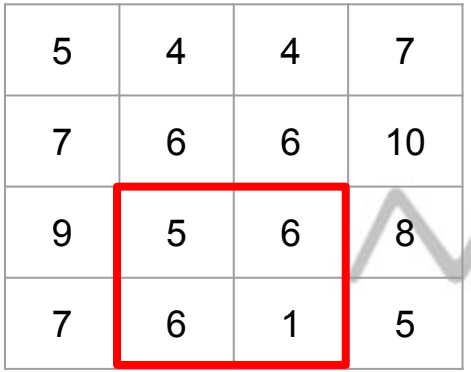
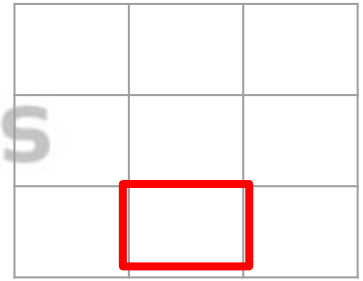
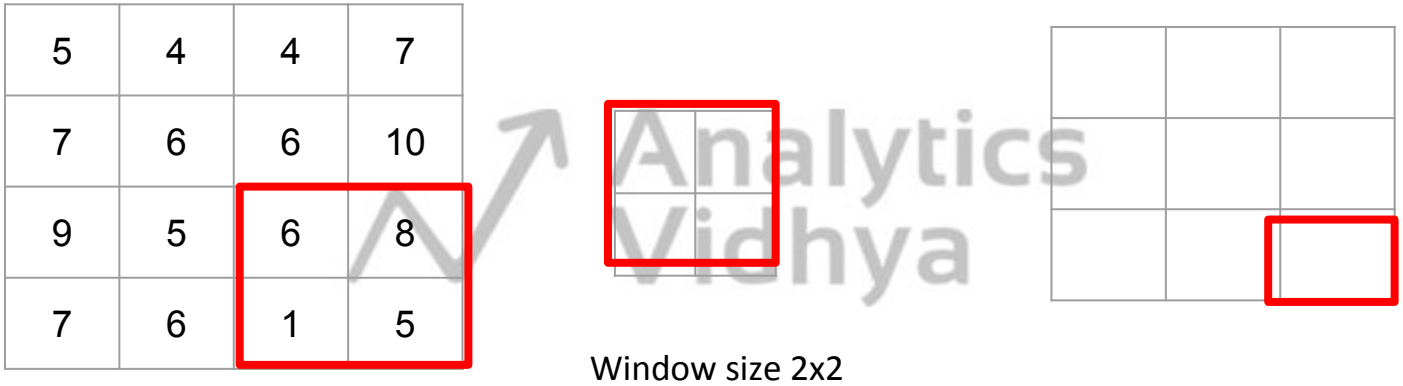


2-D Input Image

Window size 2x2



How Pooling Works?



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2-D Input Image

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2-D Input Image

Stride is 2

Window size 2x2

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2-D Input Image

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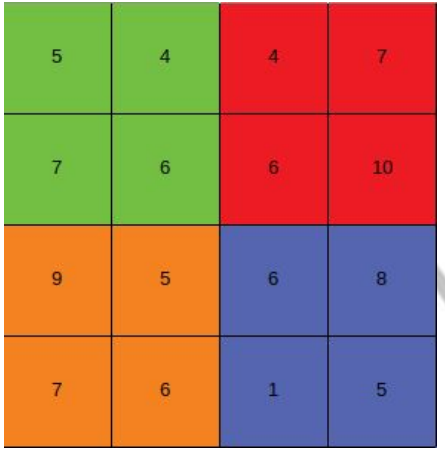
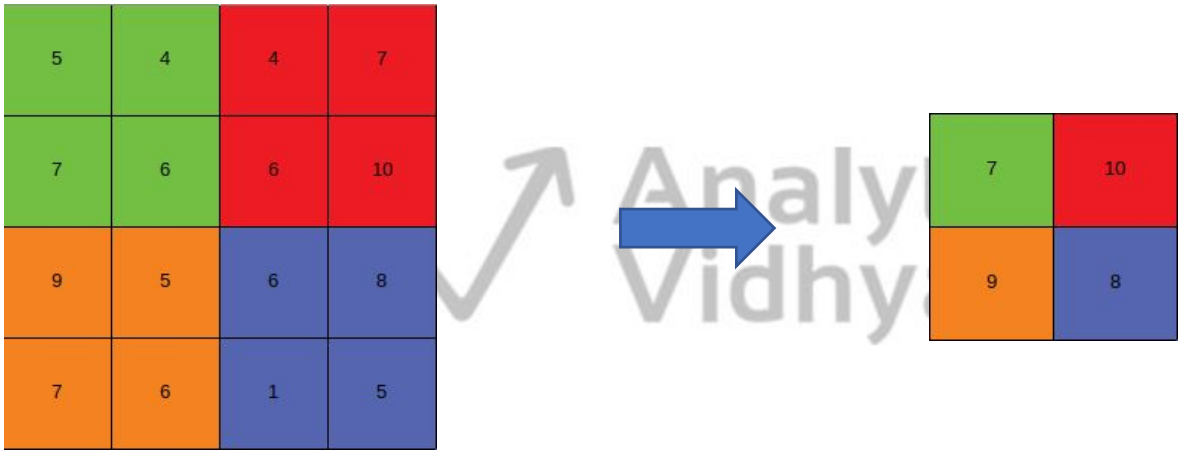


2-D Input Image

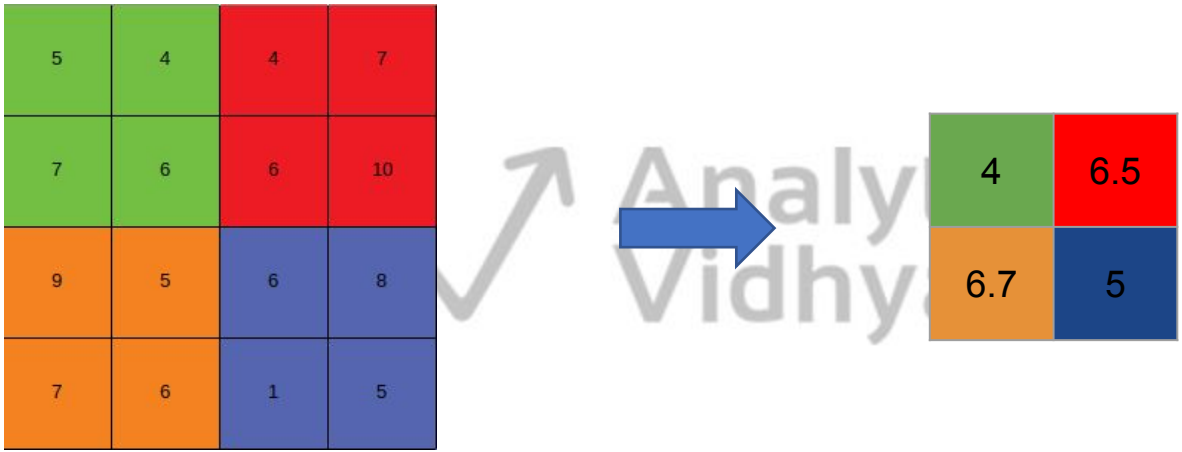
Pooling - Max Pooling



2-D Input Image

2-D Output Image

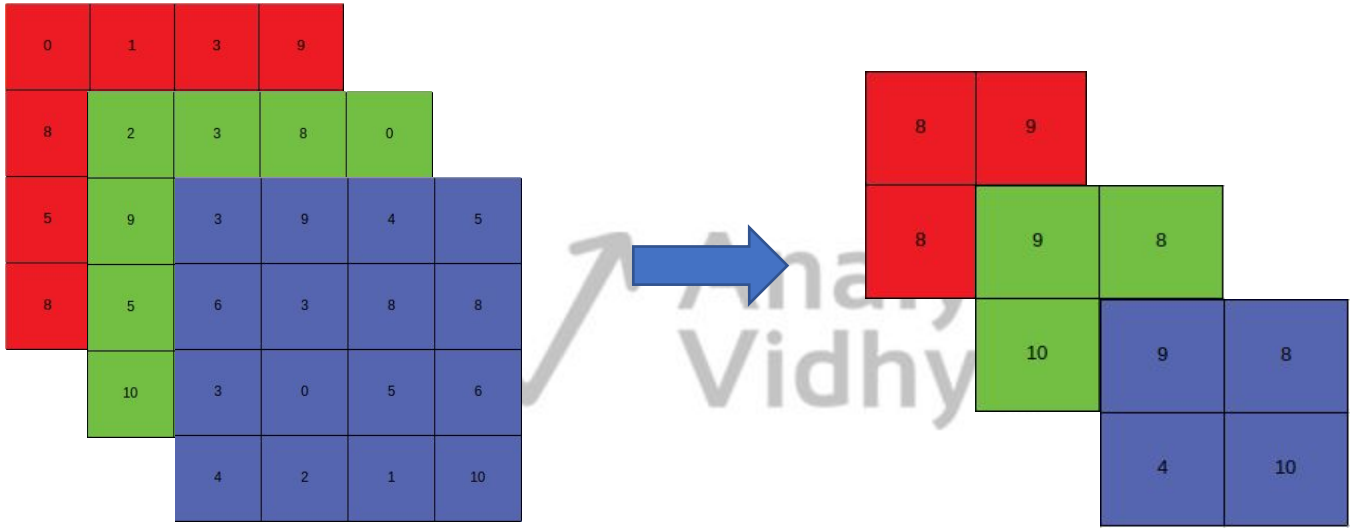
Pooling - Average Pooling



2-D Input Image

2-D Output Image

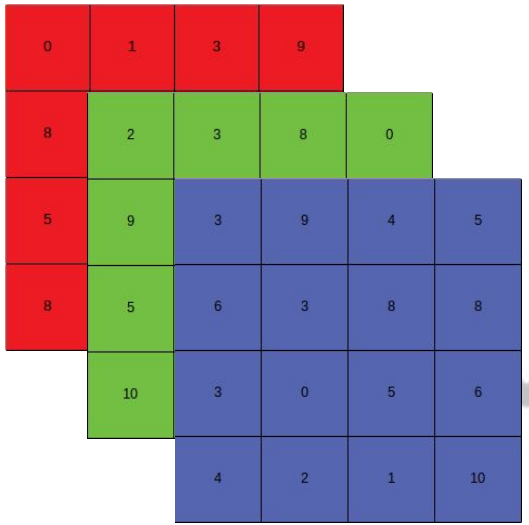
How Pooling Works?



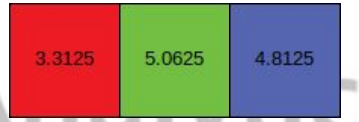
3-D Input Image

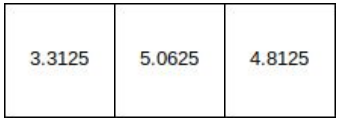
3-D Output Image

Special type of Pooling



3-D Input Image

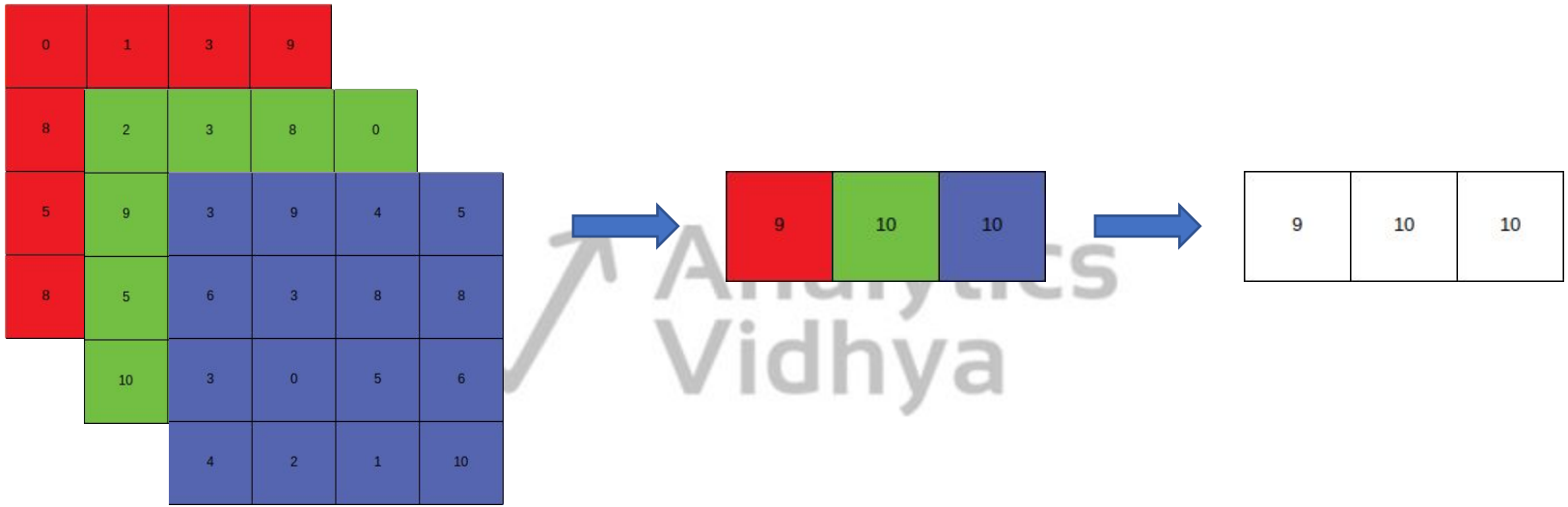




1-D Output

GlobalAveragePooling2D

Special type of Pooling



3-D Input Image

1-D Output

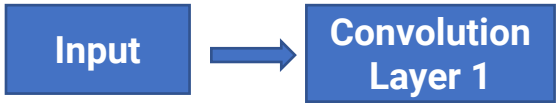
GlobalMaxPooling2D

Output of Successive Convolutions

Input

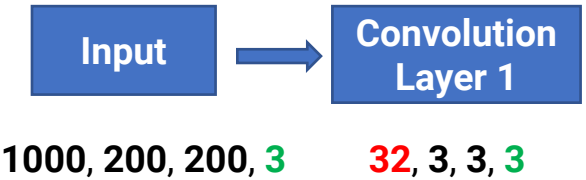
1000, 200, 200, 3

Output of Successive Convolutions



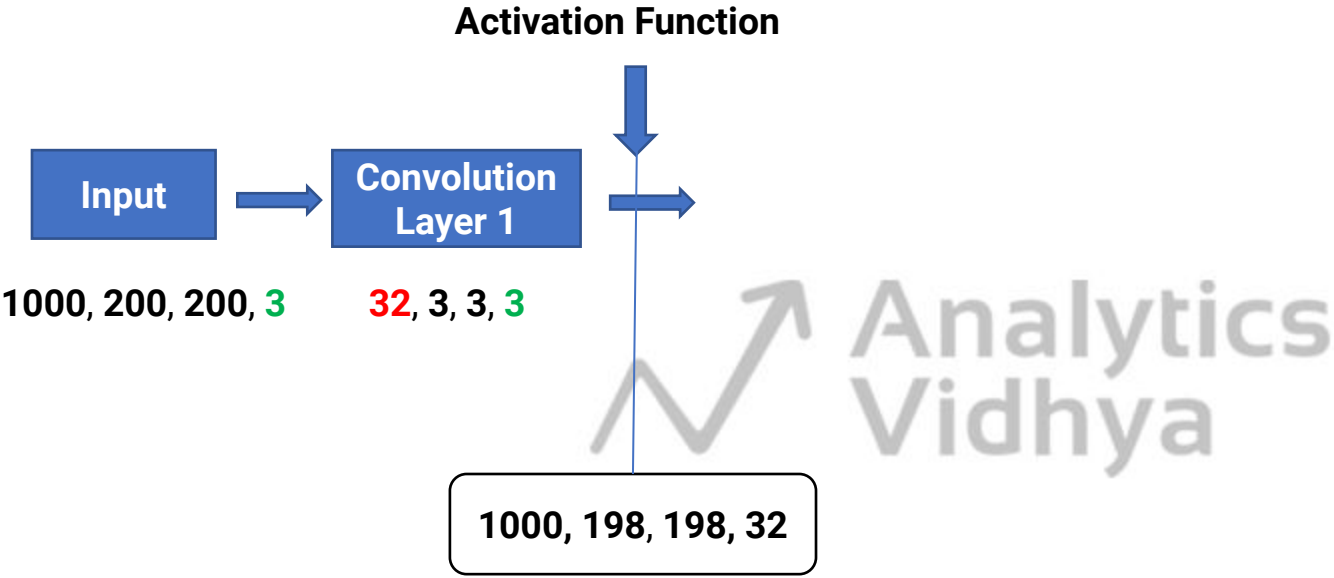
1000, 200, 200, 3 32, 3, 3, 3

Output of Successive Convolutions

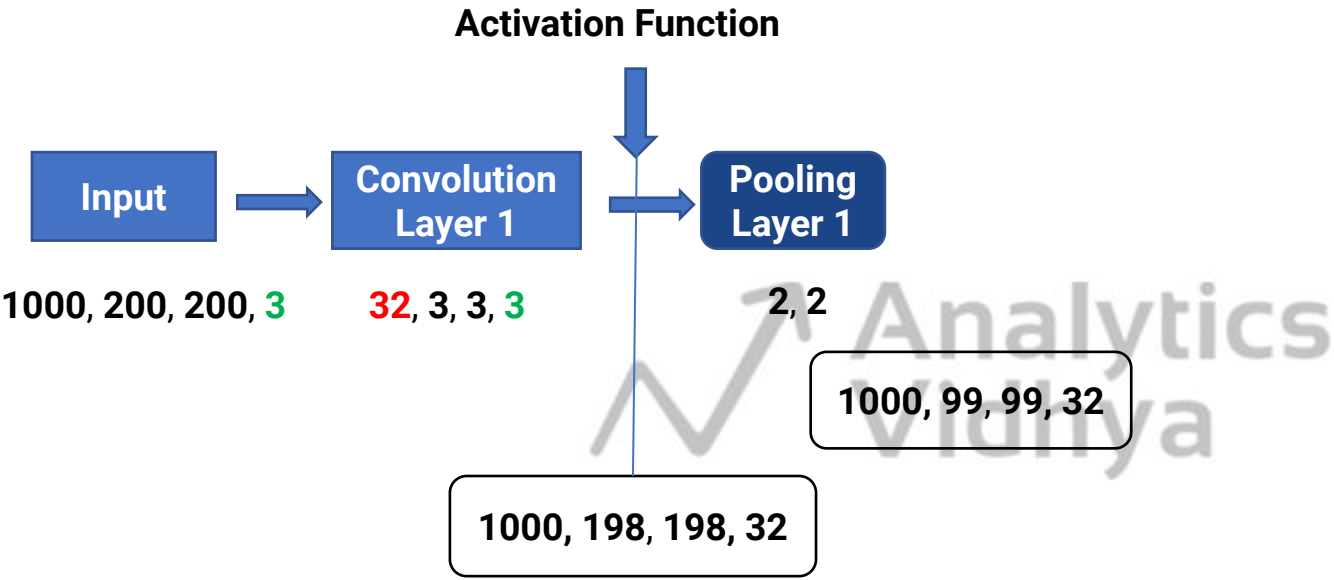


1000, 198, 198, 32

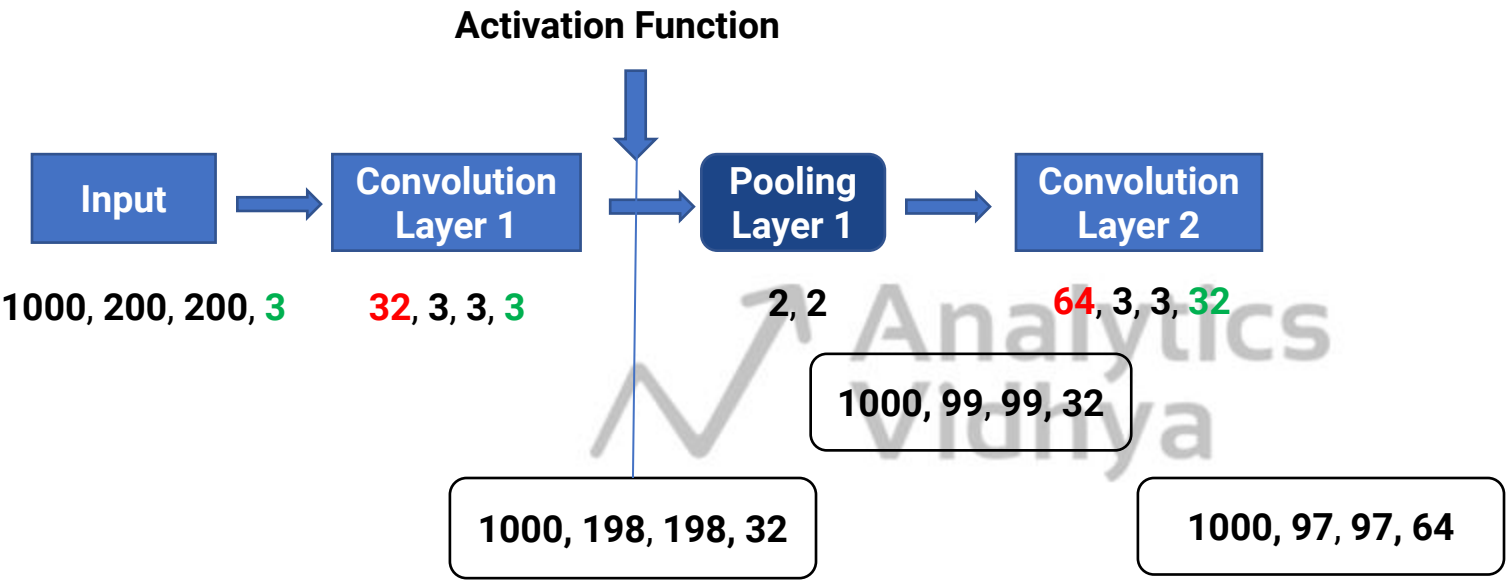
Output of Successive Convolutions



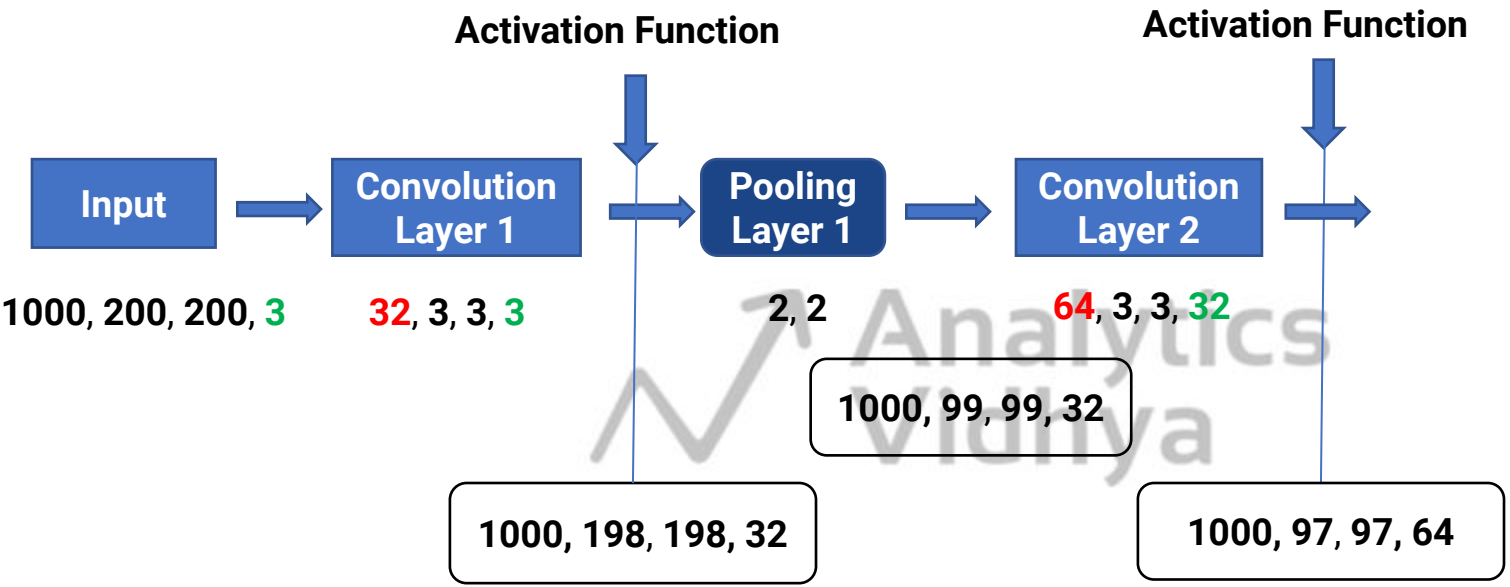
Output of Successive Convolutions



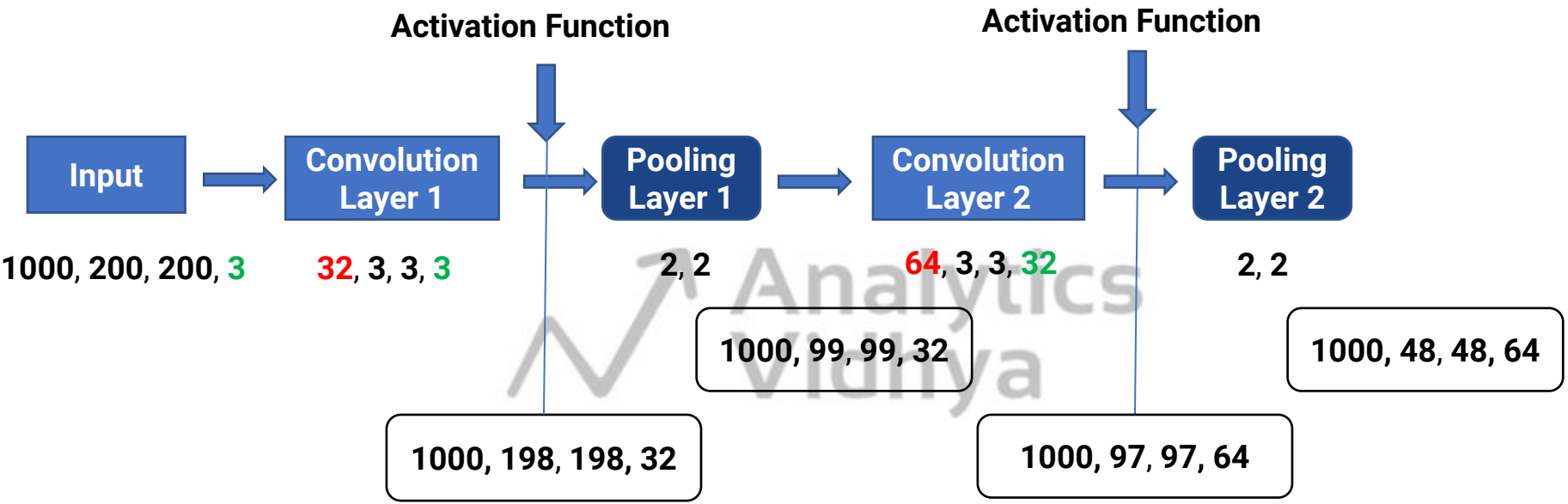
Output of Successive Convolutions



Output of Successive Convolutions



Output of Successive Convolutions



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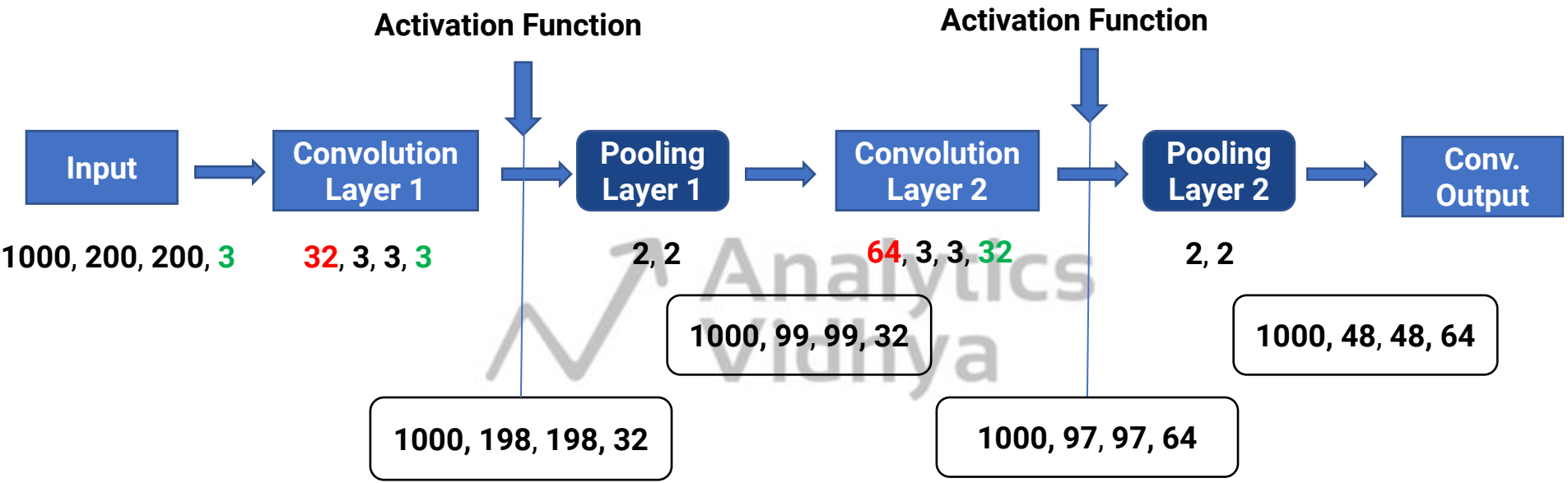

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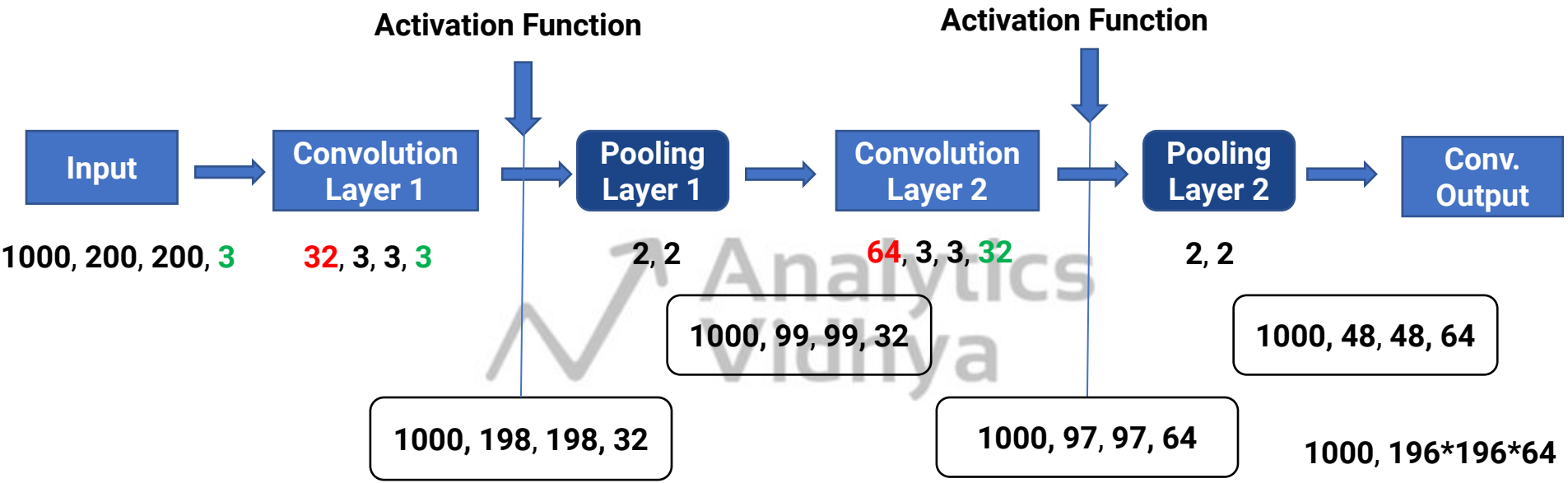

Thank You!

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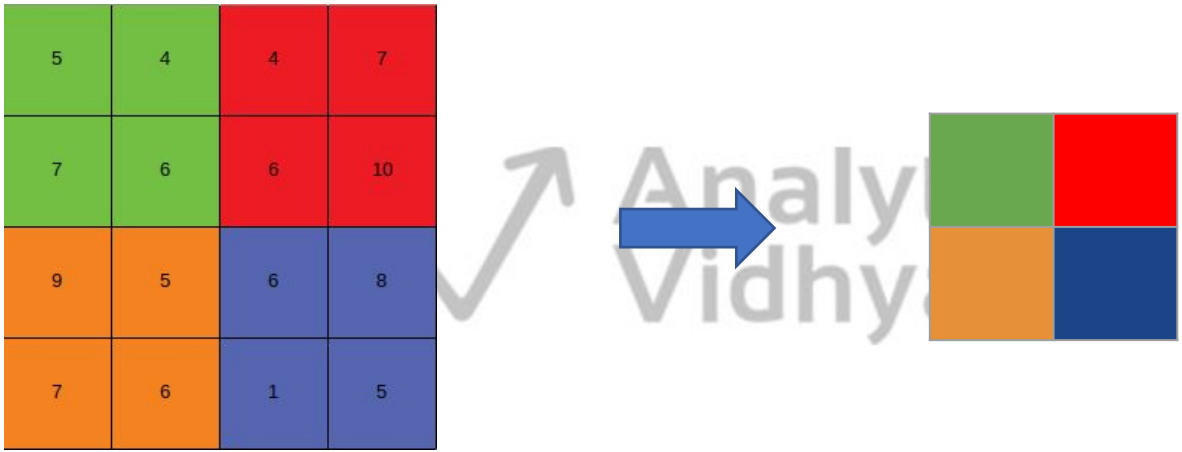

2-D Input Image

2-D Output Image