Xception Model:

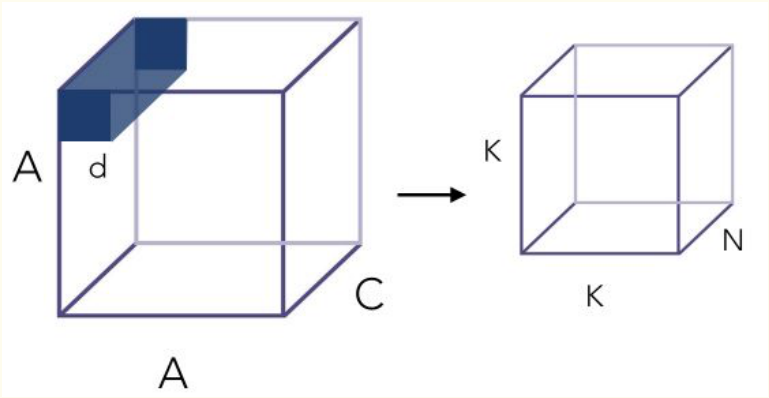
two main things:

a) Depthwise separable conv.

b) skip-connections b/w conv. blocks like ResNet.

Limitations of Normal Conv:

→ convolution is an expensive operation.



→ total computations = $d^2 \times K^2 \times C \times N$

→ to overcome this, we can do -

1. Depthwise convolution
2. Pointwise convolution

1. Depthwise Conv:

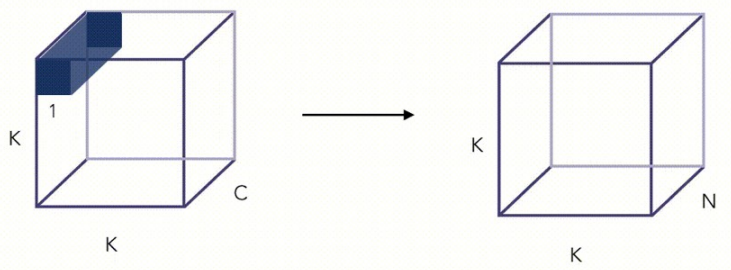
→ use $(d \times d \times 1)$ instead of $(d \times d \times C)$

→ create of image of vol = $K \times K \times C$

2. pointwise conv:

→ now apply conv of = $1 \times 1 \times N$

→ which creates image of vol = $(K \times K \times N)$



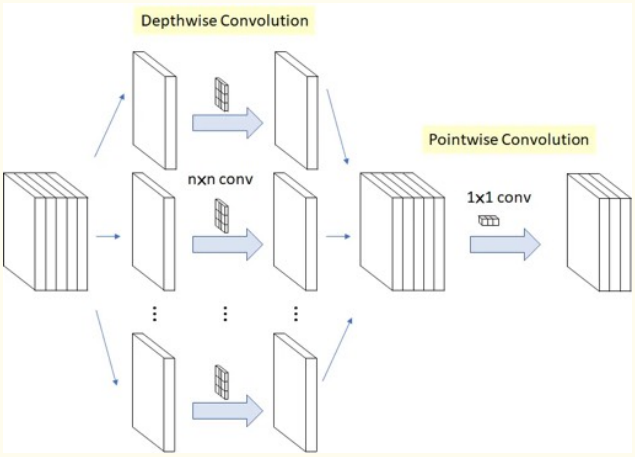
→ total operations =

$$d^2 \times k^2 \times C + k^2 \times 1^2 \times C \times N$$

$$= d^2 k^2 C + k^2 C N$$

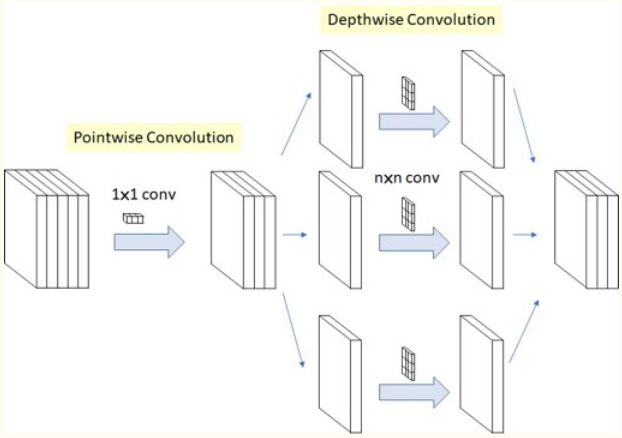
$\approx$ almost $1/N$ of previous.

InceptionV3:



→ first depthwise then pointwise

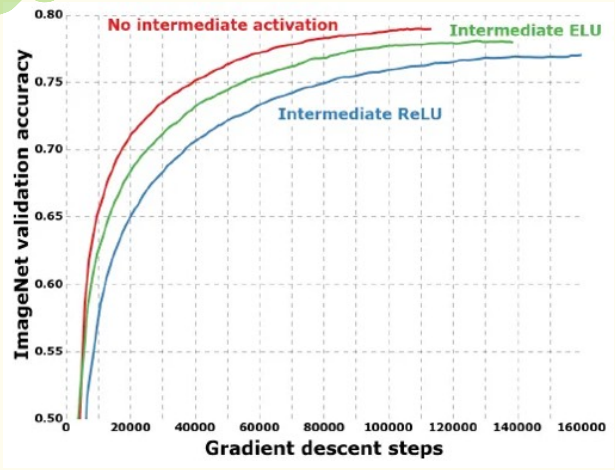
Xception:



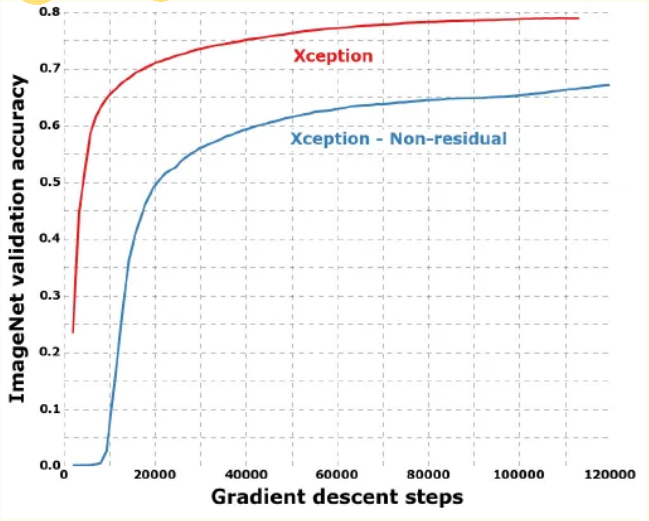
→ first pointwise then depthwise

→ In InceptionV3 there is non-linearity

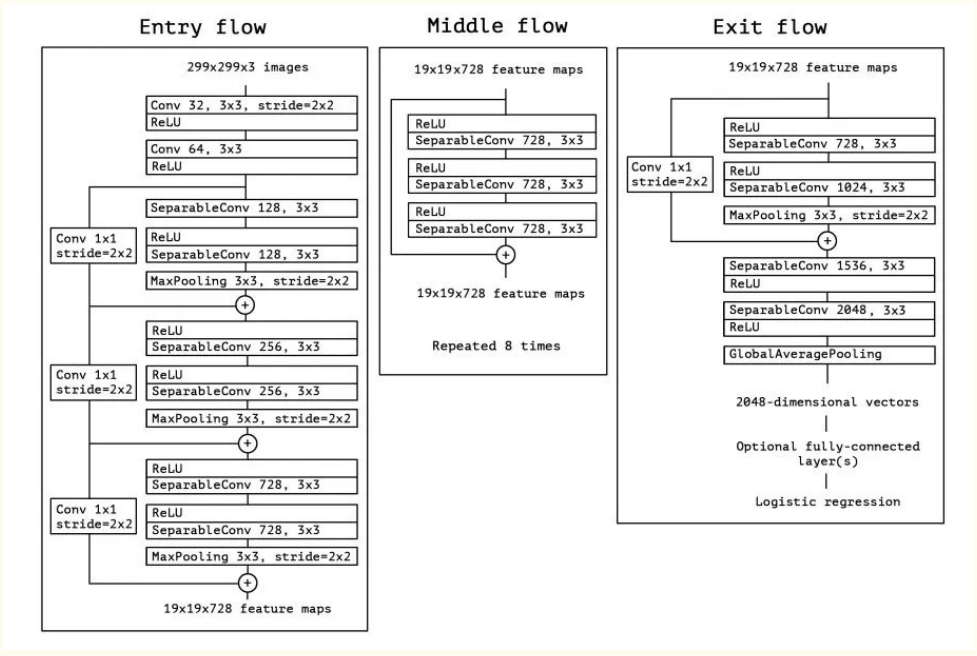
after first operation. where in Xception there is no intermediate non-linearity like ReLU or ELU.



→ skip-connections as ResNet.



Acteel Model:



→ entry flow extract features from the input.

→ exit flow refine these features for final predictions.