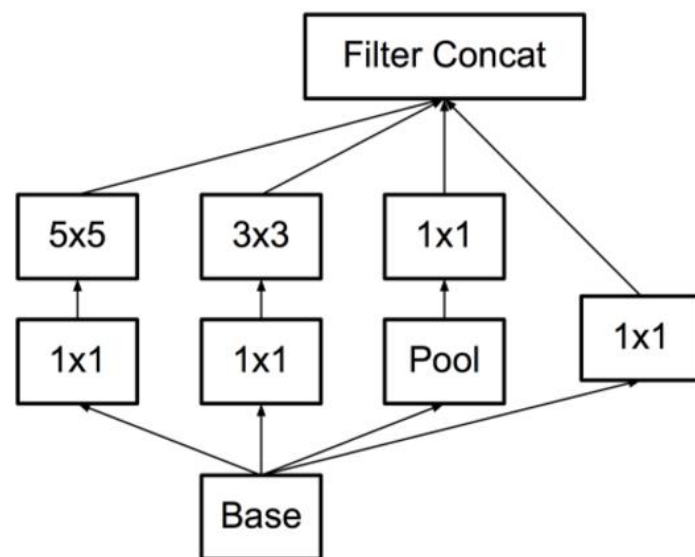
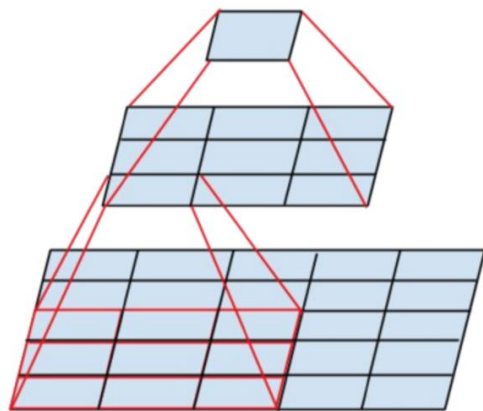


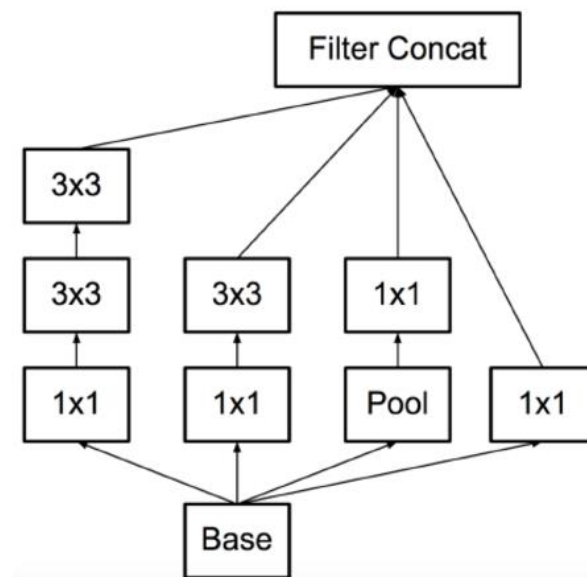
Inception-v2, v3

전태호

More Factorization

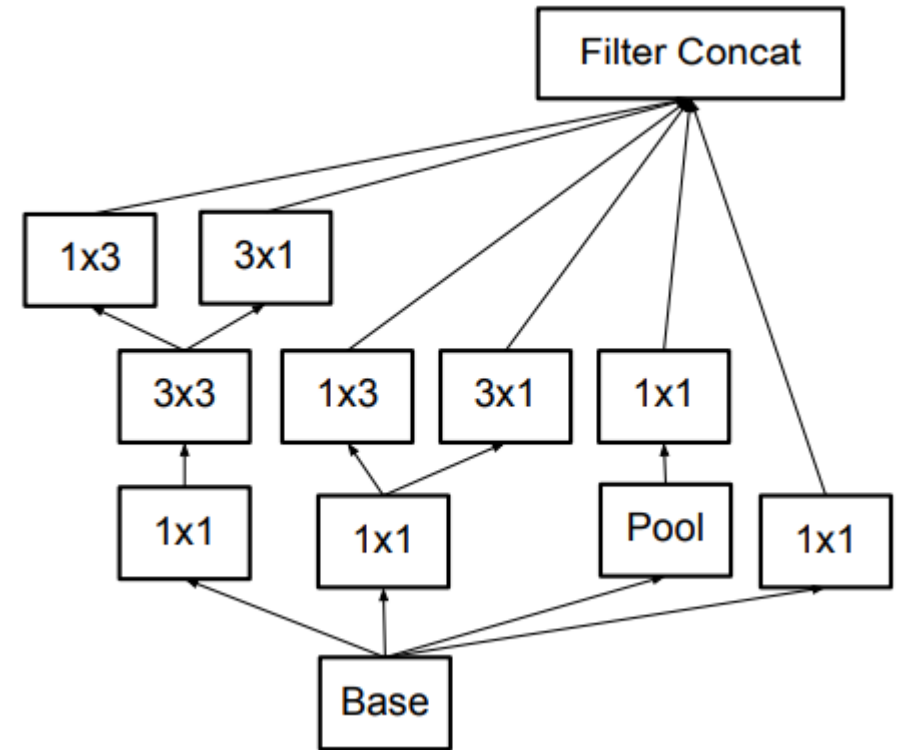
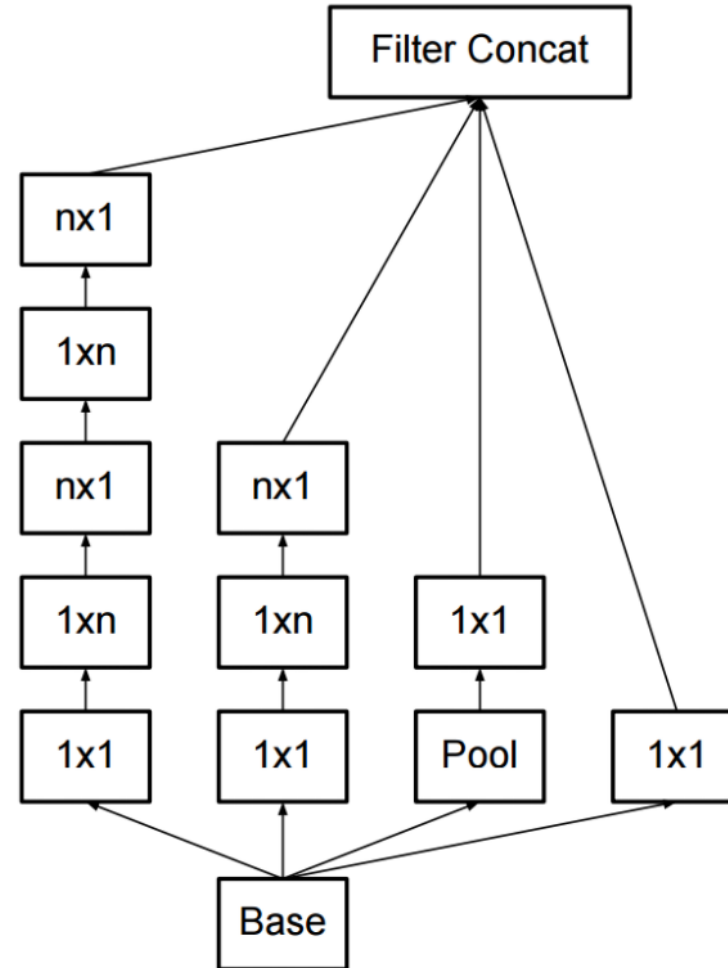
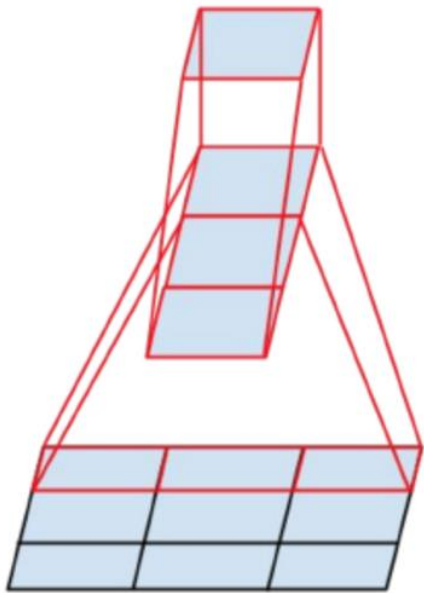


original inception module



factorizing inception module

Spatial Factorization into Asymmetric Convolutions



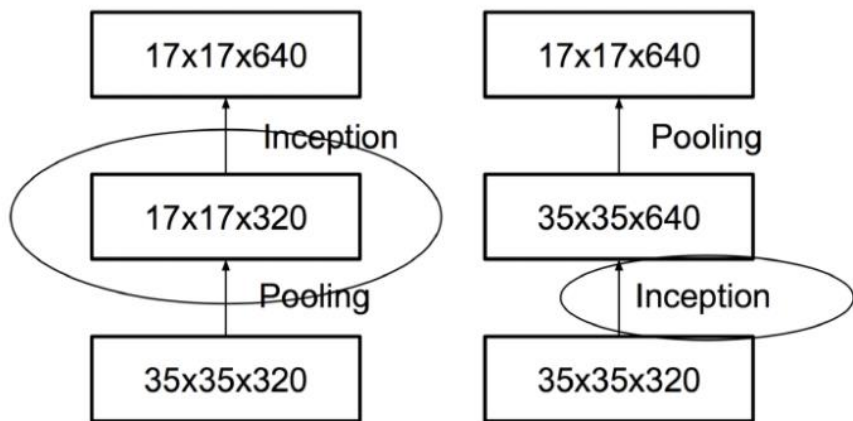
Utility of Auxiliary Classifiers

보조 softmax 가 별로 효용 가치가 없다고 판단,
맨 앞단 auxiliary classifier는 제거

Efficient Grid Size Reduction

Pooling을 왜 해줘야하나?

Parameter증가 없이 downsizing으로 overfitting 방지



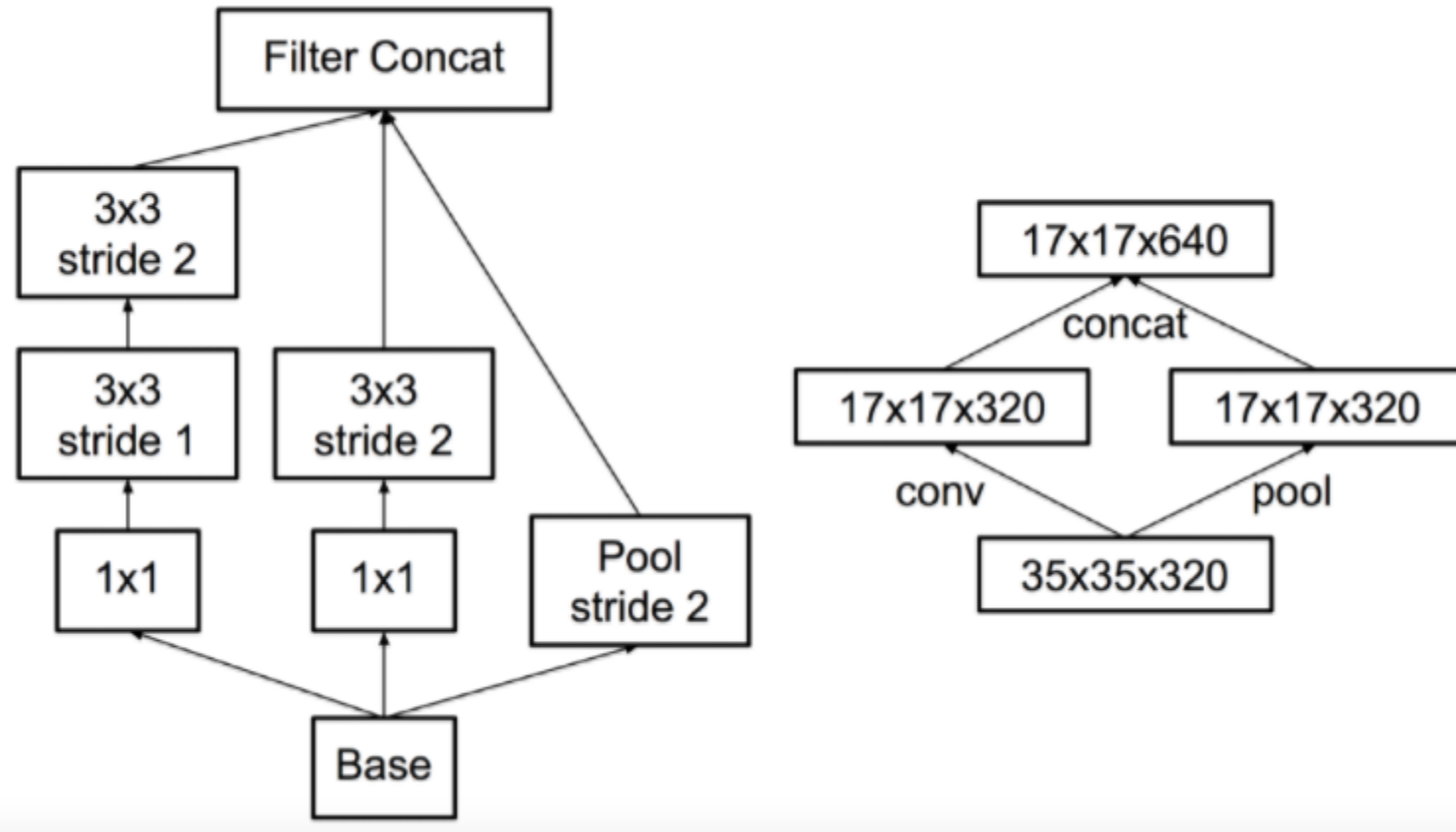
representational bottleneck

expansive computation

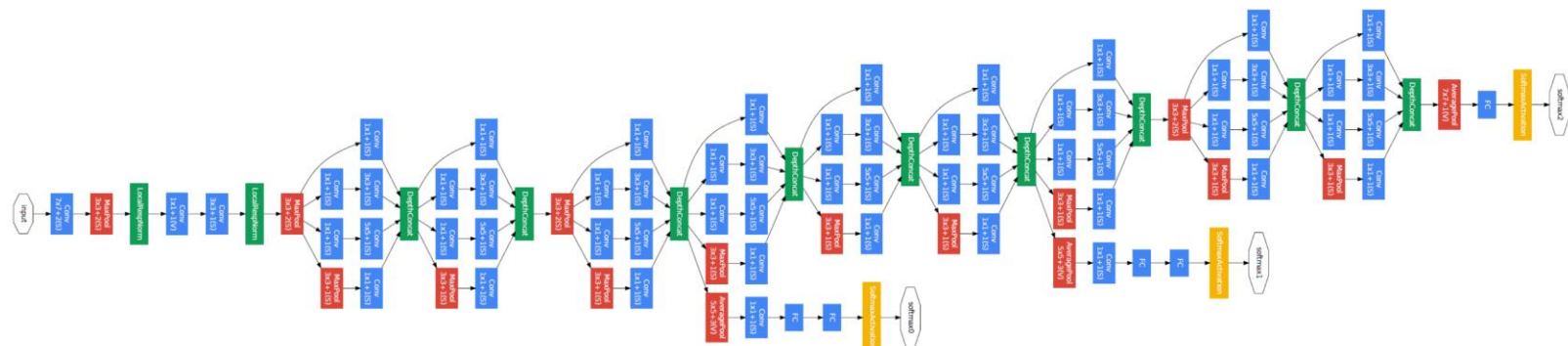
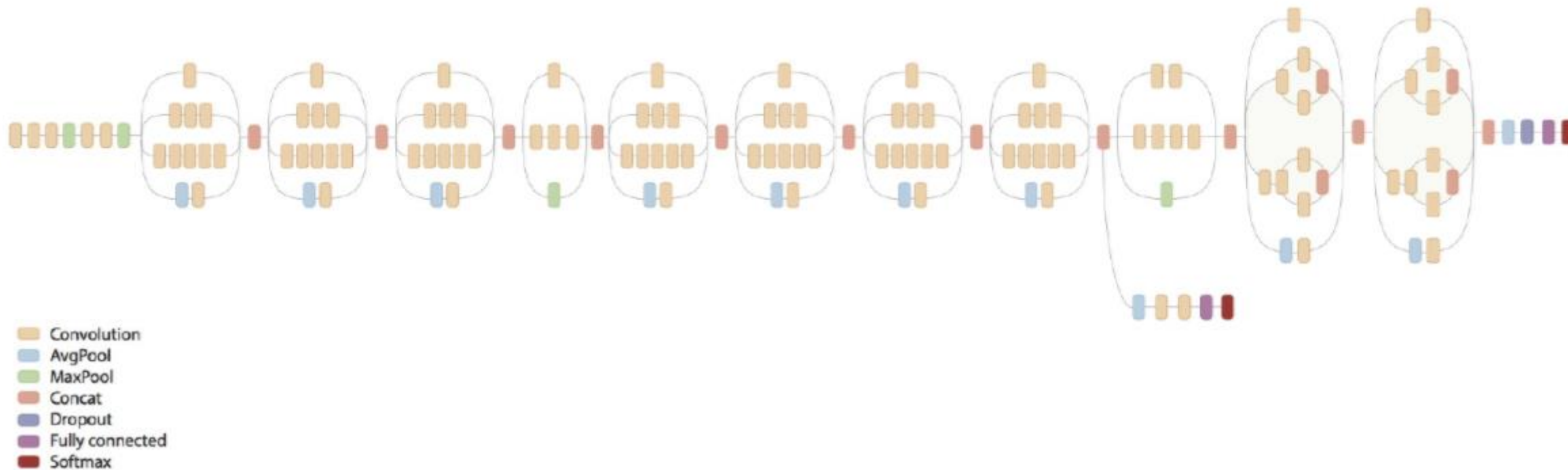
Q) 결과는 동일
어떤 걸 먼저 해주는게 좋을까?

정보 손실 vs 연산량 증가

Efficient Grid Size Reduction



Inception v2



Label Smoothing

“문제는 모델이 예측에 대해 너무 확신한다는 것이다.
우리는 모델의 확신에 강도를 줄일 것을 제안한다.”

$$H(q', p) = - \sum_{k=1}^K \log p(k) q'(k) = (1-\epsilon)H(q, p) + \epsilon H(u, p)$$

RMSProp, BN-auxiliary

SGD -> Momentum -> RMSProp

the fully connected layer of the auxiliary classifier is also batch-normalized, not just the convolutions

마지막 FC layer도 BN 적용

성능 비교

Network	Top-1 Error	Top-5 Error	Cost Bn Ops
GoogLeNet [20]	29%	9.2%	1.5
BN-GoogLeNet	26.8%	-	1.5
BN-Inception [7]	25.2%	7.8	2.0
Inception-v2	23.4%	-	3.8
Inception-v2 RMSProp	23.1%	6.3	3.8
Inception-v2 Label Smoothing	22.8%	6.1	3.8
Inception-v2 Factorized 7×7	21.6%	5.8	4.8
Inception-v2 BN-auxiliary	21.2%	5.6%	4.8

single-crop

Network	Crops Evaluated	Top-5 Error	Top-1 Error
GoogLeNet [20]	10	-	9.15%
GoogLeNet [20]	144	-	7.89%
VGG [18]	-	24.4%	6.8%
BN-Inception [7]	144	22%	5.82%
PReLU [6]	10	24.27%	7.38%
PReLU [6]	-	21.59%	5.71%
Inception-v3	12	19.47%	4.48%
Inception-v3	144	18.77%	4.2%

multi-crop