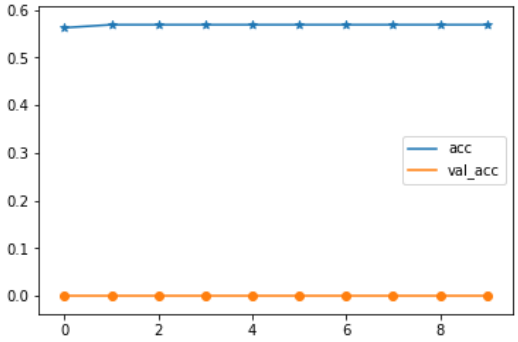
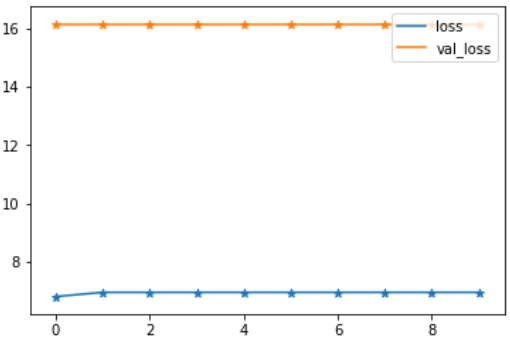
Model Training

Model 1 : CNN 1.0

Convolution2D→Convolution2D→MaxPooling2D→Convolution2D→MaxPooling2D→Dense→Dense

Train on 3020 samples, validate on 756 samples, Epoch=10



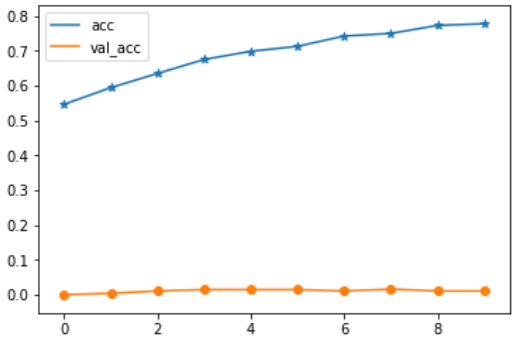


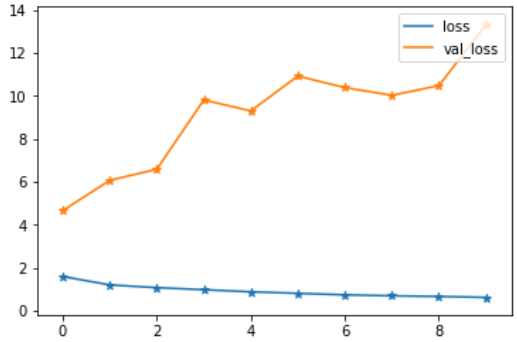
Model 2 : PIL 1.0 + CNN 1.0

threshold_yen

Convolution2D→Convolution2D→MaxPooling2D→Convolution2D→MaxPooling2D→Dense→Dense

Train on 3020 samples, validate on 756 samples, Epoch=10





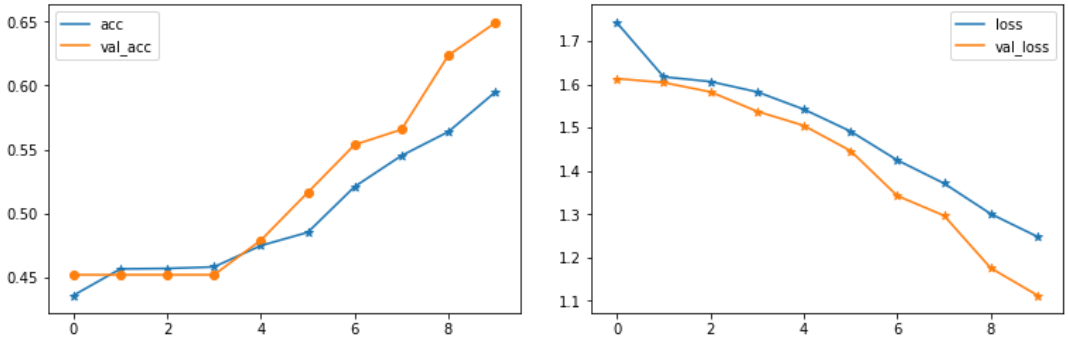
Model 3 : PIL 2.0 + CNN 2.0

threshold_triangle

ZeroPadding2D→Convolution2D→ZeroPadding2D→Convolution2D→MaxPooling2D→
ZeroPadding2D→Convolution2D→ZeroPadding2D→Convolution2D→MaxPooling2D→
ZeroPadding2D→Convolution2D→ZeroPadding2D→Convolution2D→MaxPooling2D→
Flattern→Dense→Dense→Dense(softmax)

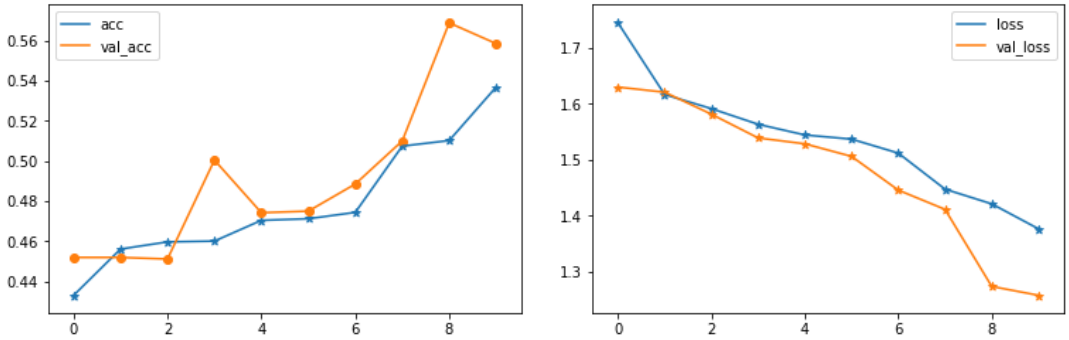
Num_folds=3, batch_size = 32, nb_epoch = 10

The 1st fold. Train on 2517 samples, validate on 1259 samples.



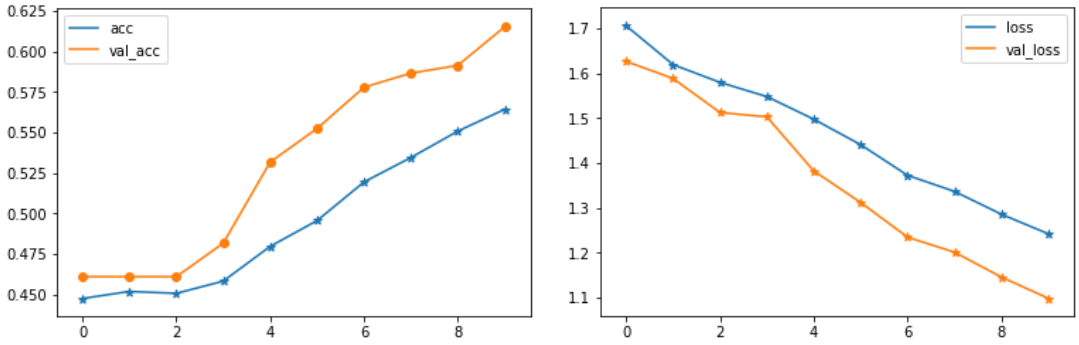
Score log_loss: 1.11275574094

The 2nd fold. Train on 2517 samples, validate on 1259 samples.



Score log_loss: 1.25852711234

The 3rd fold. Train on 2518 samples, validate on 1258 samples

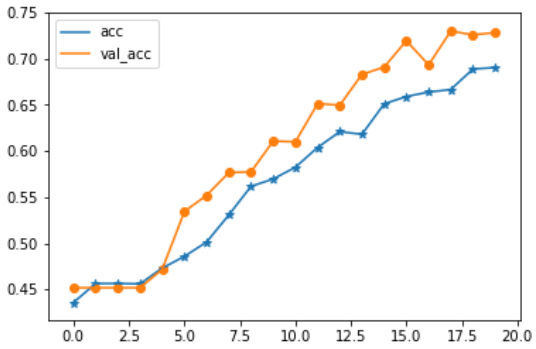


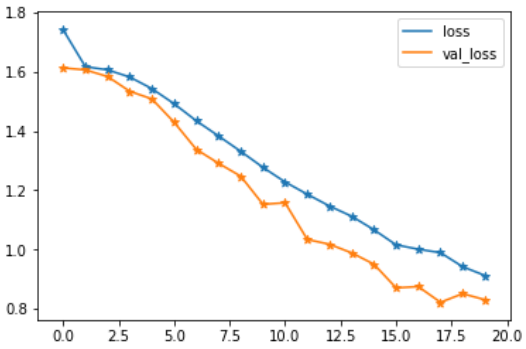
Score log_loss: 1.09858663501

Log_loss train independent avg: 1.1566385326

Num_folds=3, batch_size = 32, nb_epoch = 20

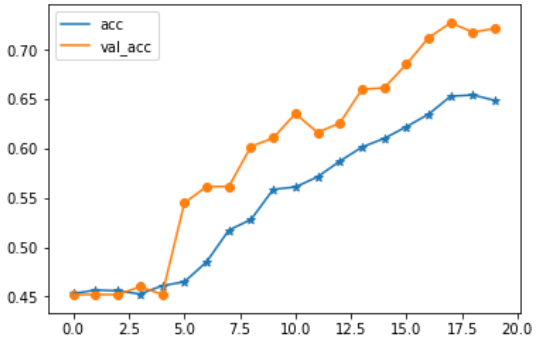
The 1st fold. Train on 2517 samples, validate on 1259 samples.

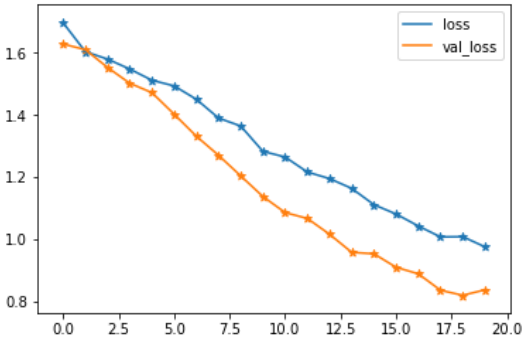




Score log_loss: 0.830910136431

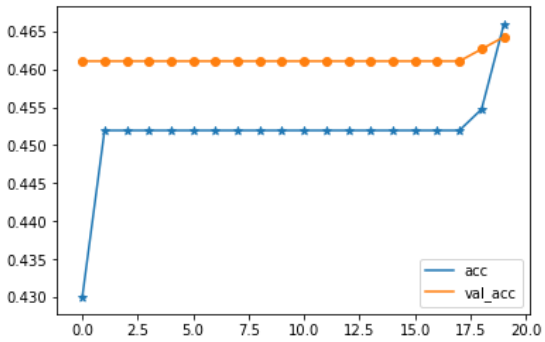
The 2nd fold. Train on 2517 samples, validate on 1259 samples.

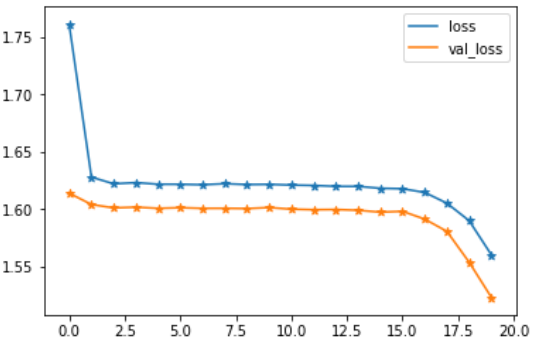




Score log_loss: 0.837534641292

The 3rd fold. Train on 2518 samples, validate on 1258 samples



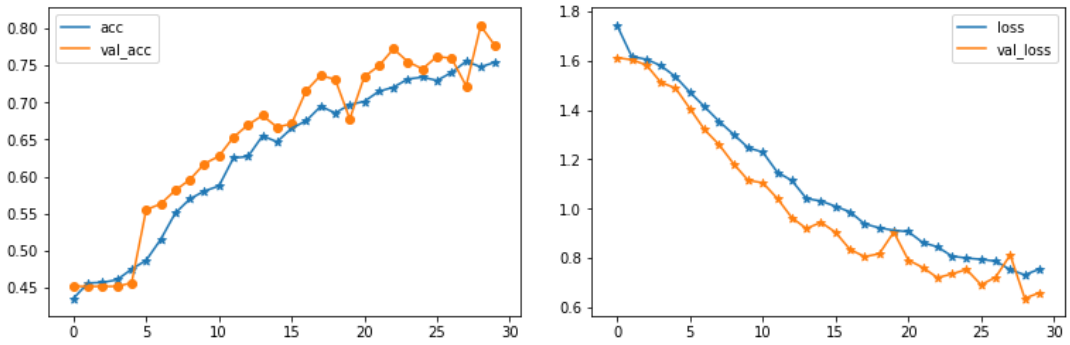


Score log_loss: 1.52328066928

Log_loss train independent avg: 1.06378682657

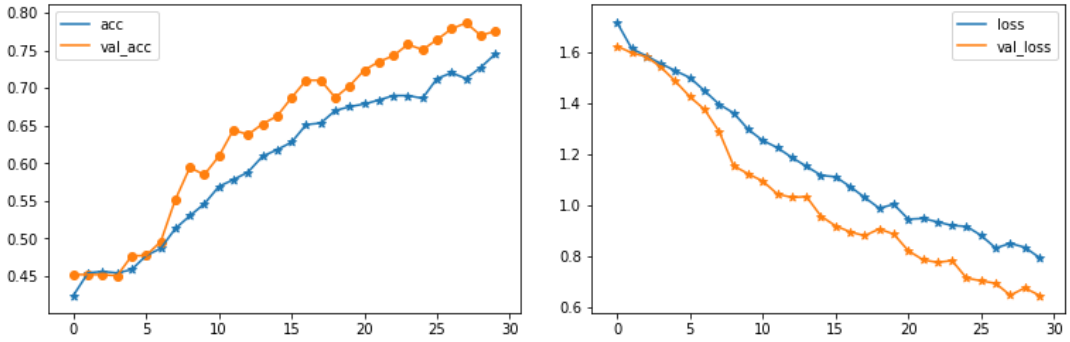
Num_folds=3, batch_size = 32, nb_epoch = 30

The 1st fold. Train on 2517 samples, validate on 1259 samples.



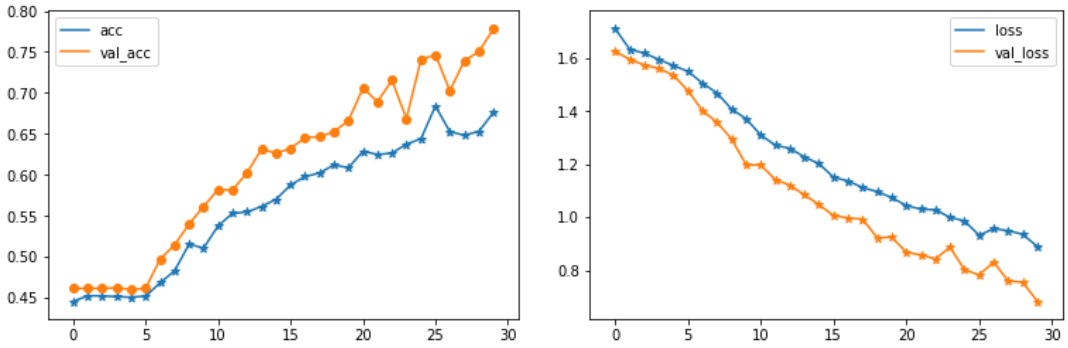
Score log_loss: 0.658560426445

The 2nd fold. Train on 2517 samples, validate on 1259 samples.



Score log_loss: 0.644398359862

The 3rd fold. Train on 2518 samples, validate on 1258 samples

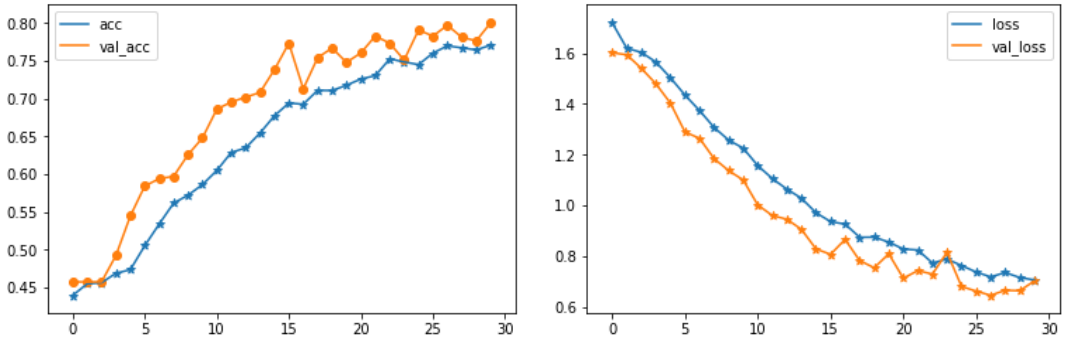


Score log_loss: 0.683152115133

Log_loss train independent avg: 0.662031375211

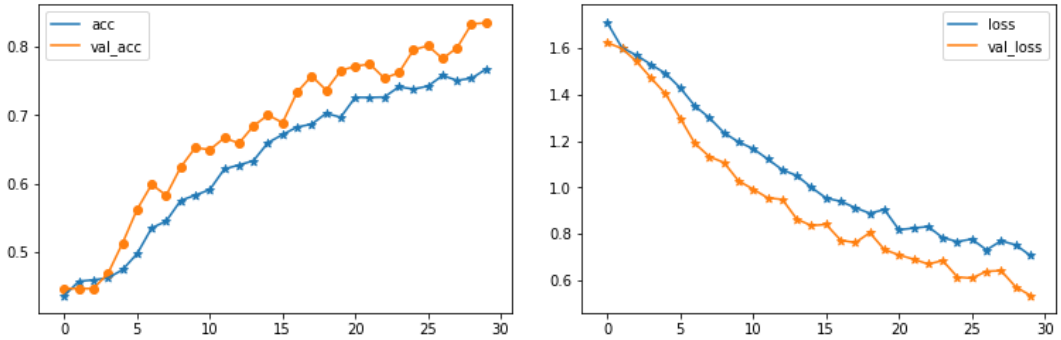
Num_folds=6, batch_size = 32, nb_epoch = 30

The 1st fold. Train on 3146 samples, validate on 630 samples.



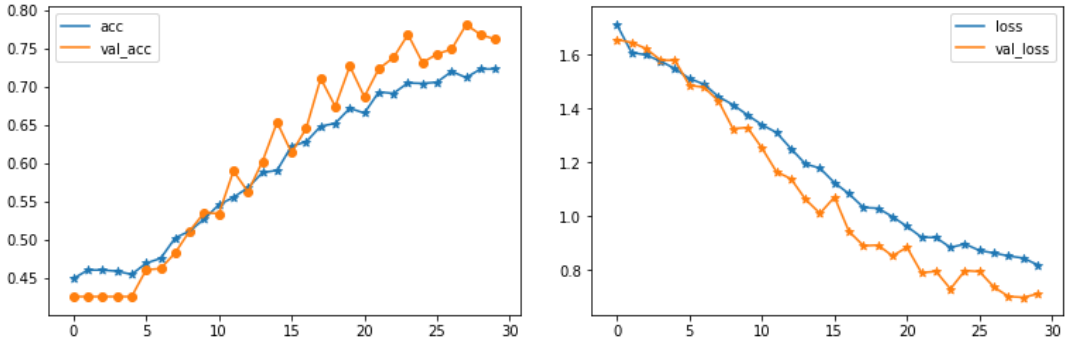
Score log_loss: 0.701318000325

The 2nd fold. Train on 3146 samples, validate on 630 samples.



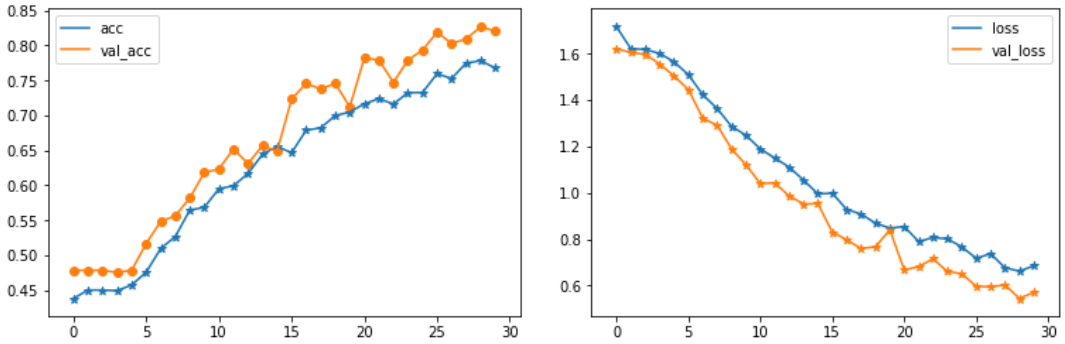
Score log_loss: 0.53542168449

The 3rd fold. Train on 3147 samples, validate on 629 samples.



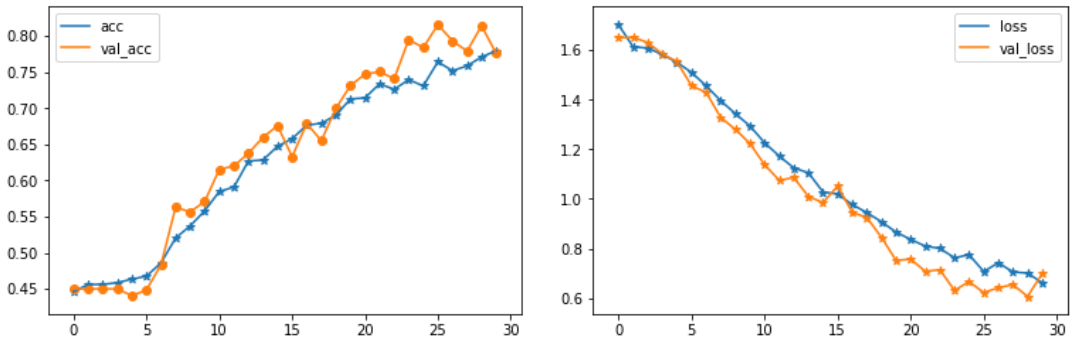
Score log_loss: 0.710662076712

The 4th fold. Train on 3147 samples, validate on 629 samples.



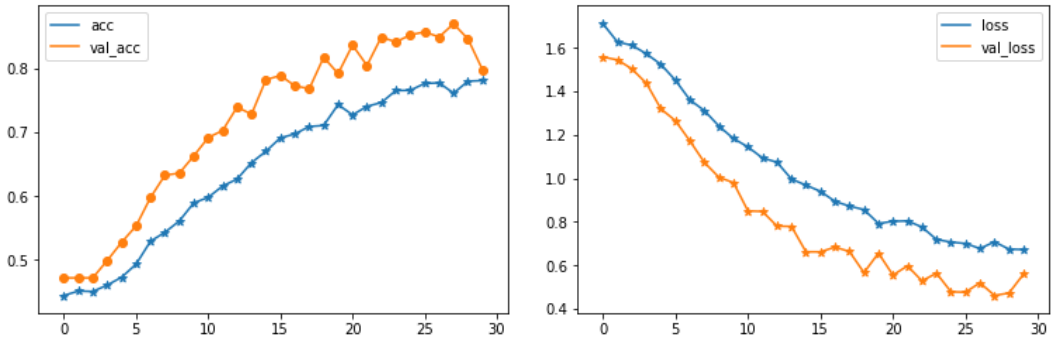
Score log_loss: 0.570422085768

The 5th fold. Train on 3147 samples, validate on 629 samples.



Score log_loss: 0.698296441801

The 6th fold. Train on 3147 samples, validate on 629 samples.

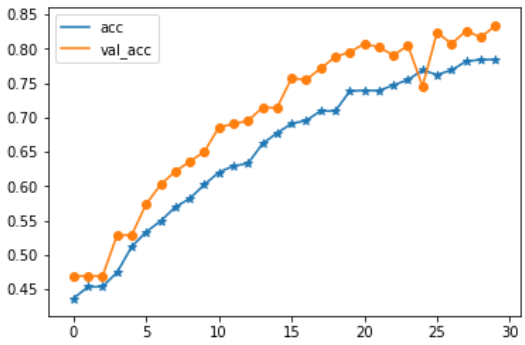


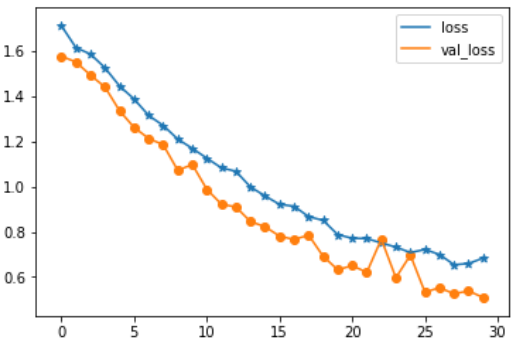
Score log_loss: 0.559599460563

Log_loss train independent avg: 0.629280842749

Num_folds=9, batch_size = 32, nb_epoch = 30

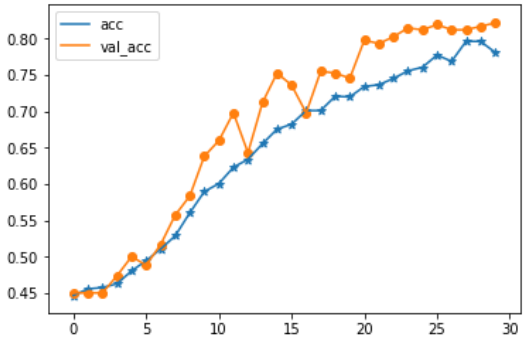
The 1st fold. Train on 3356 samples, validate on 420 samples.

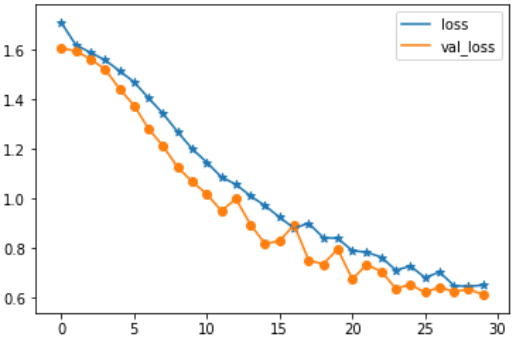




Score log_loss: 0.508859539186

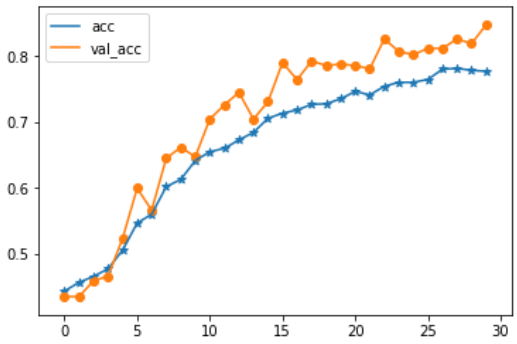
The 2nd fold. Train on 3356 samples, validate on 420 samples.

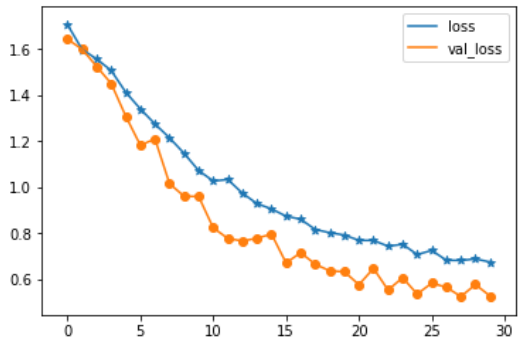




Score log_loss: 0.61334217076

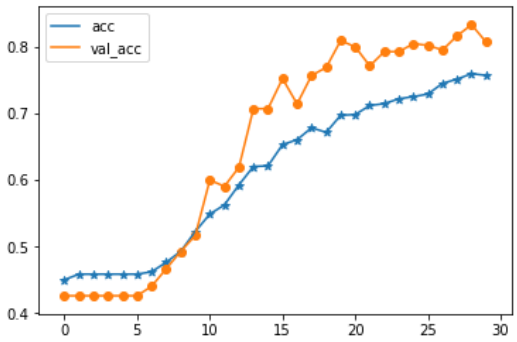
The 3rd fold. Train on 3356 samples, validate on 420 samples.

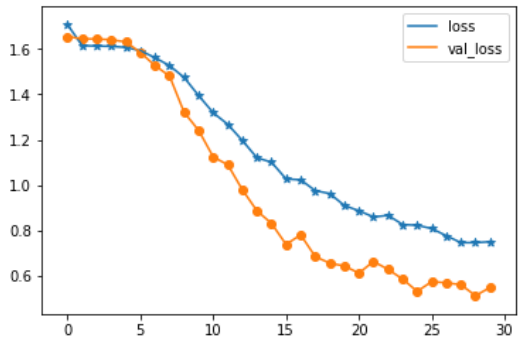




Score log_loss: 0.526611889172

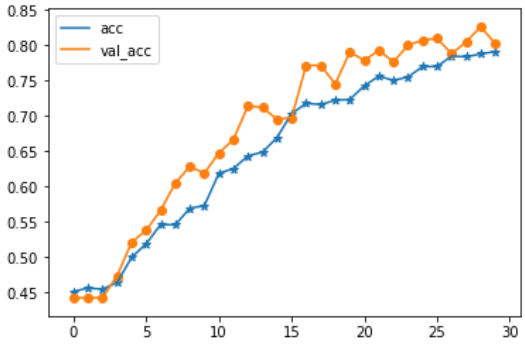
The 4th fold. Train on 3356 samples, validate on 420 samples.

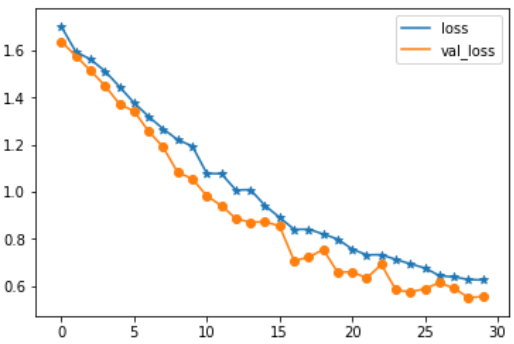




Score log_loss: 0.549761933942

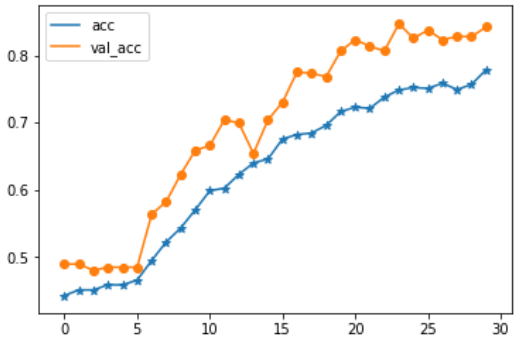
The 5th fold. Train on 3356 samples, validate on 420 samples.

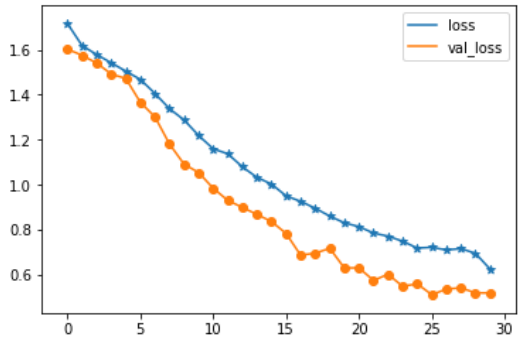




Score log_loss: 0.556441876628

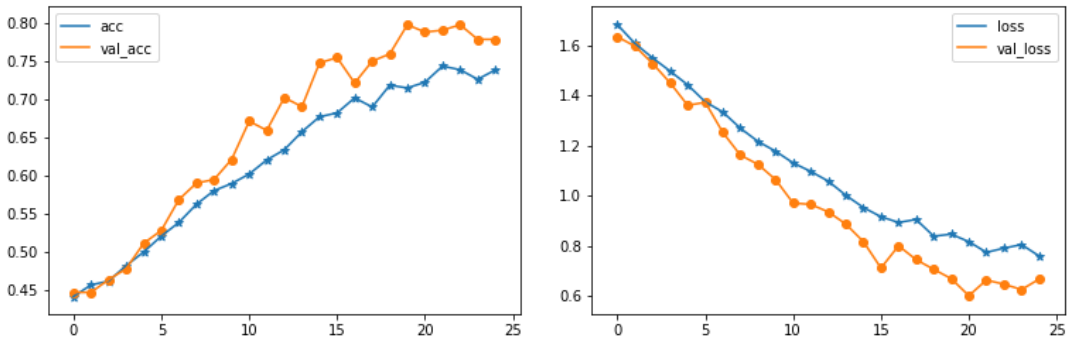
The 6th fold. Train on 3357 samples, validate on 419 samples.





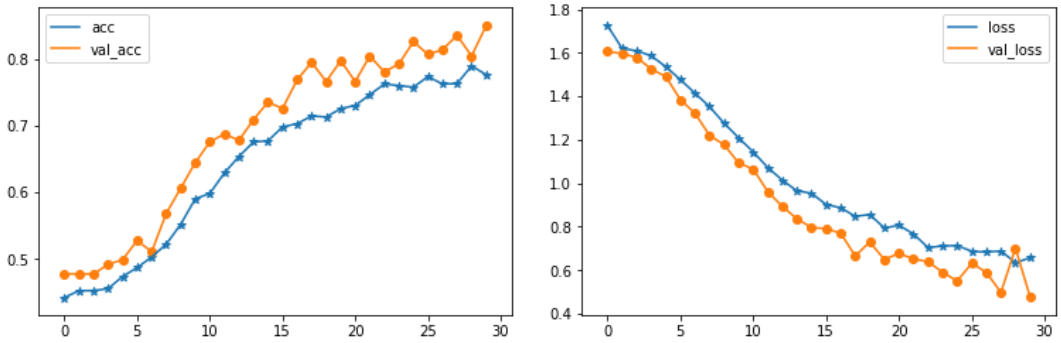
Score log_loss: 0.520530509056

The 7th fold. Train on 3357 samples, validate on 419 samples.



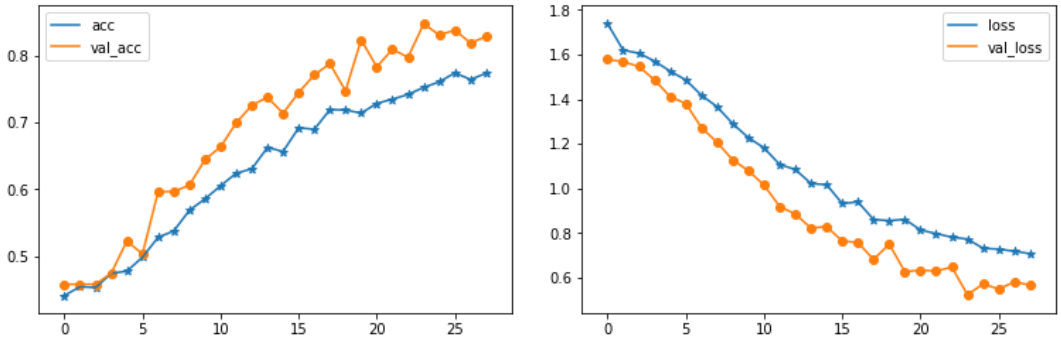
Score log_loss: 0.666725925535

The 8th fold. Train on 3357 samples, validate on 419 samples.



Score log_loss: 0.477851694422

The 9th fold. Train on 3357 samples, validate on 419 samples.



Score log_loss: 0.565681634437

Log_loss train independent avg: 0.553974635316

Model 4 : Data Set Preprocessing

对训练集进行旋转、放大、缩小等操作，使得训练集的 8 个类别的数目均等。

	ALB	BET	DOL	LAG	NOF	OTHER	SHARK	YFT
Before	**1700**	**200**	**117**	**67**	**465**	**299**	**176**	**734**
After	**1719**	**1700**	**1702**	**1702**	**1700**	**1704**	**1701**	**1704**

采用数据集预处理之前效果最好的参数设置

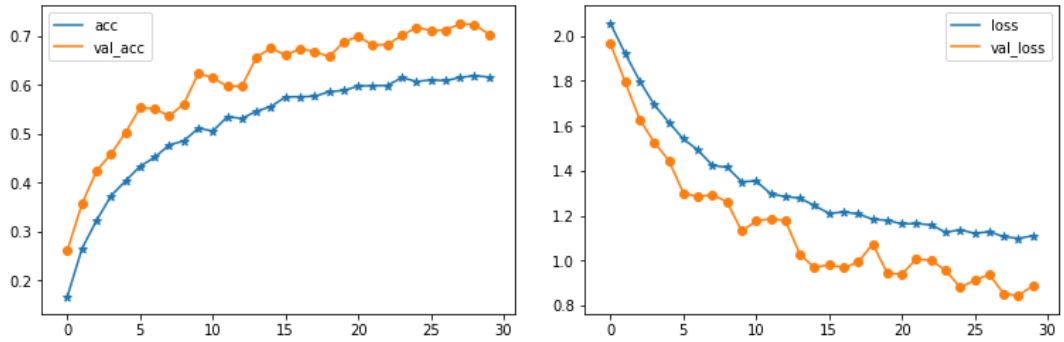
Num_folds=9, batch_size = 32, nb_epoch = 30, CNN 12 layers

	Before	After
Log_loss train independent avg	0.553974635316	0.98998662977

Model 5 : Data Set Preprocessing + CNN Changeable Depth

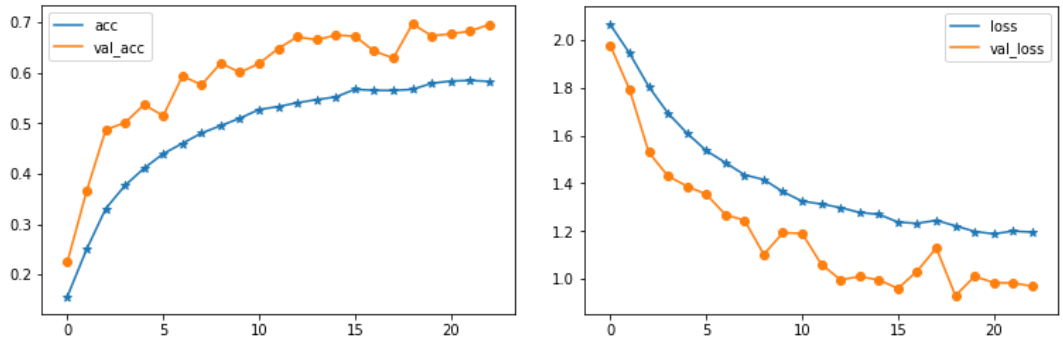
Num_folds=9, batch_size = 32, nb_epoch = 30, CNN 12 layers

The 1st fold. Train on 12117 samples, validate on 1515 samples.



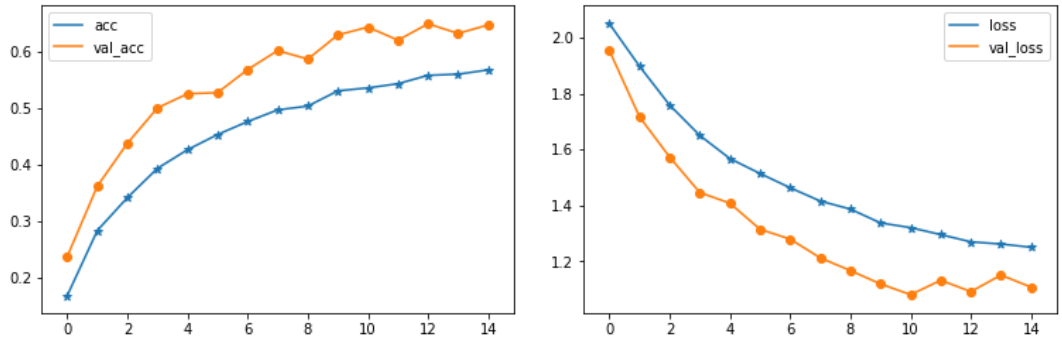
Score log_loss: 0.889734941875

The 2nd fold. Train on 12117 samples, validate on 1515 samples.



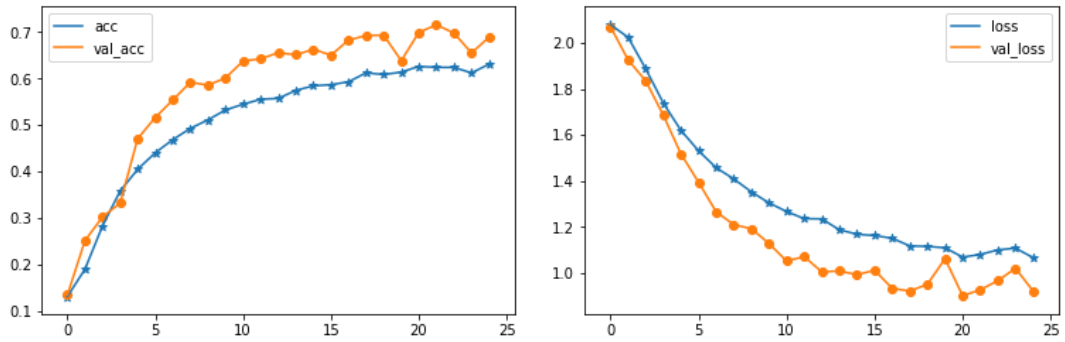
Score log_loss: 0.96977292772

The 3rd fold. Train on 12117 samples, validate on 1515 samples.



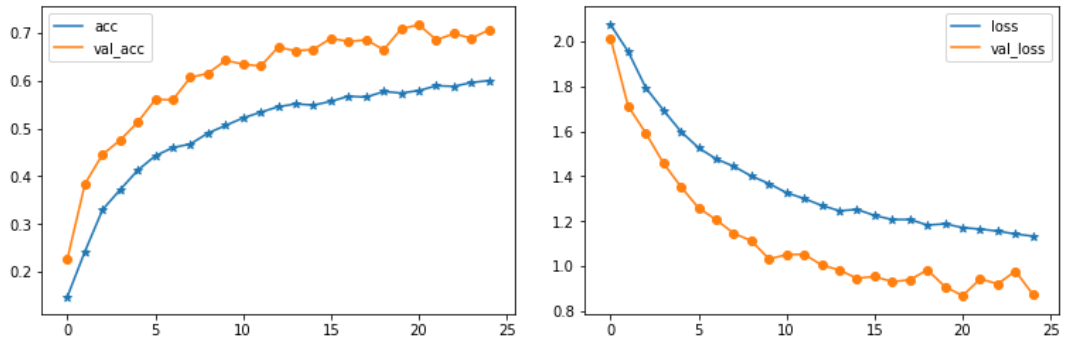
Score log_loss: 1.10678251525

The 4th fold. Train on 12117 samples, validate on 1515 samples.



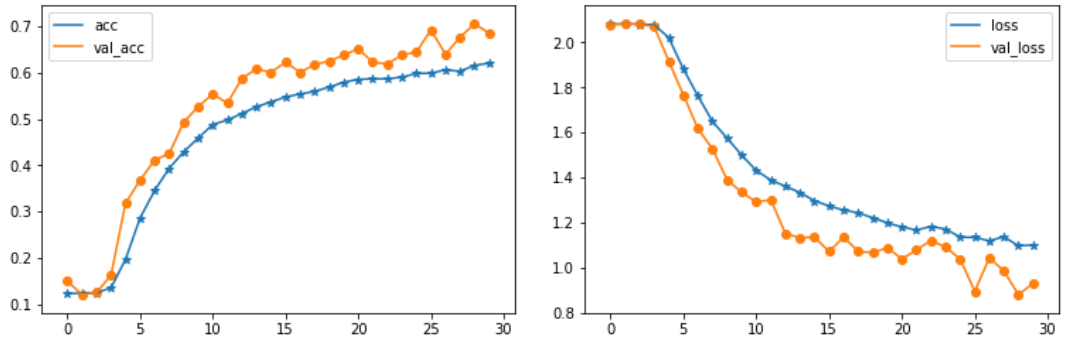
Score log_loss: 0.921802264304

The 5th fold. Train on 12117 samples, validate on 1515 samples.



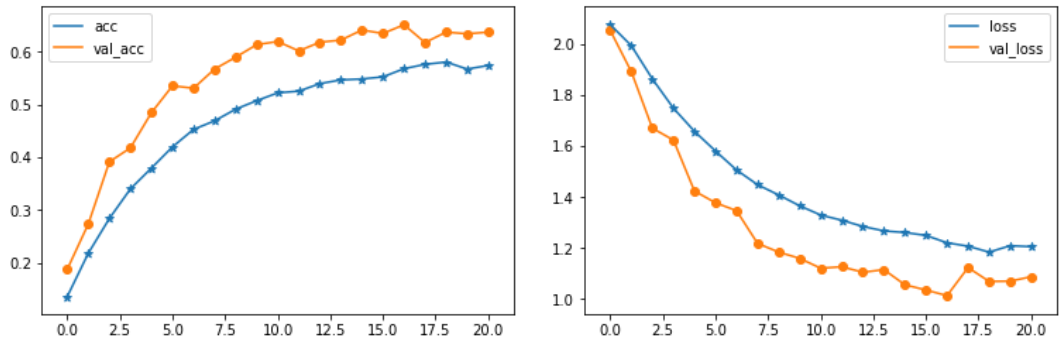
Score log_loss: 0.872604974777

The 6th fold. Train on 12117 samples, validate on 1515 samples.



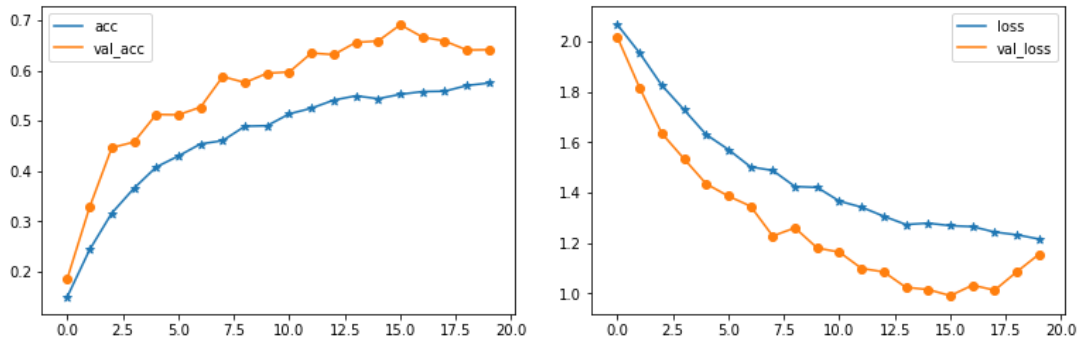
Score log_loss: 0.929546614081

The 7th fold. Train on 12117 samples, validate on 1515 samples.



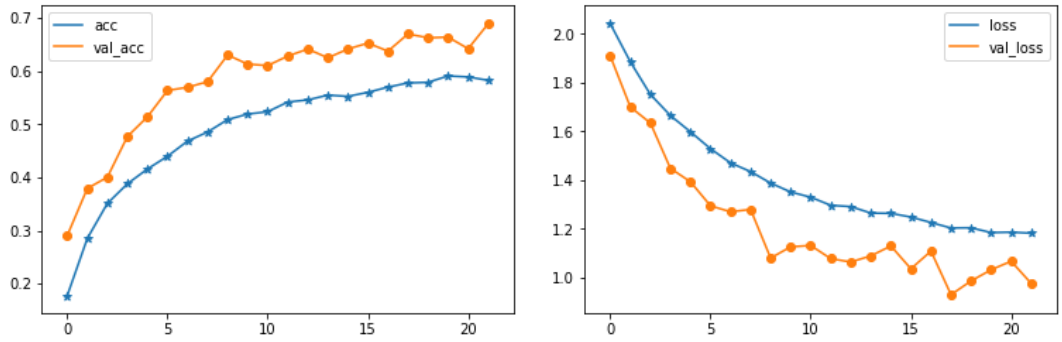
Score log_loss: 1.08795400727

The 8th fold. Train on 12117 samples, validate on 1515 samples.



Score log_loss: 1.15552021685

The 9th fold. Train on 12117 samples, validate on 1515 samples.

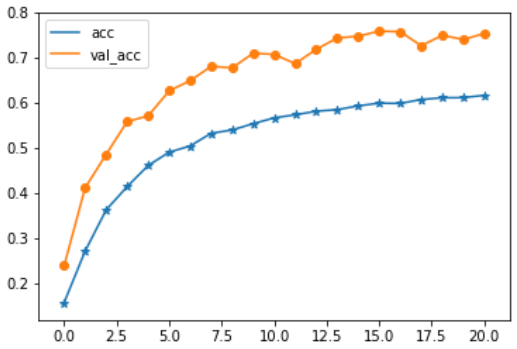


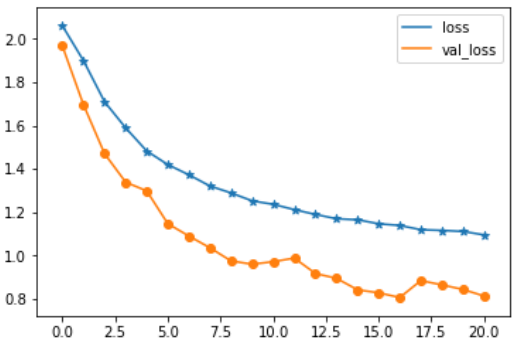
Score log_loss: 0.976326116995

Log_loss train independent avg: 0.98998662977

Num_folds=9, batch_size = 32, nb_epoch = 30, CNN 9 layers

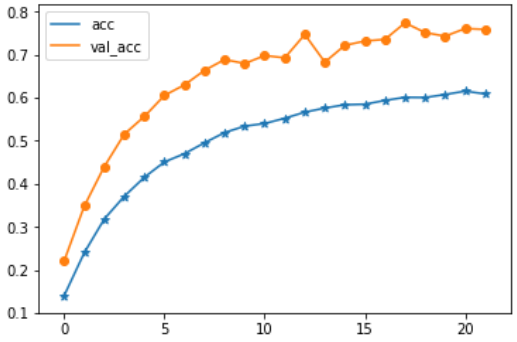
The 1st fold. Train on 12117 samples, validate on 1515 samples.

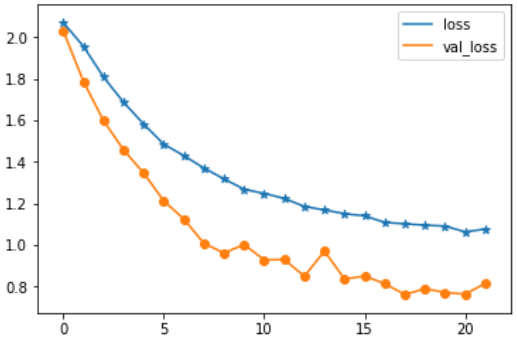




Score log_loss: 0.812375929501

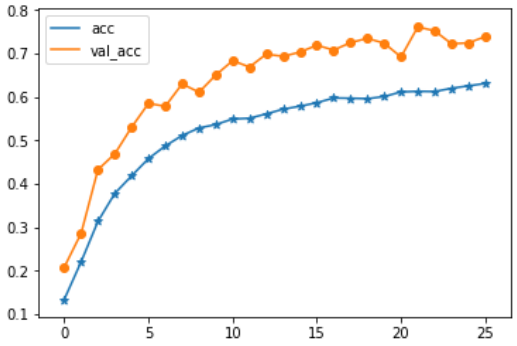
The 2nd fold. Train on 12117 samples, validate on 1515 samples.

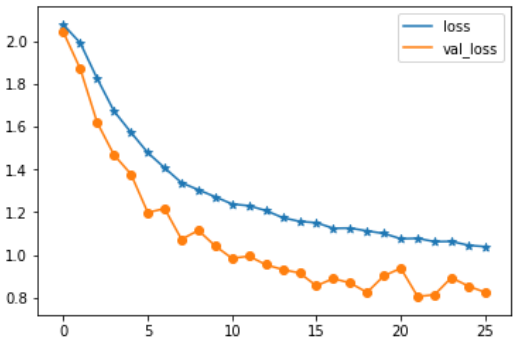




Score log_loss: 0.814899185224

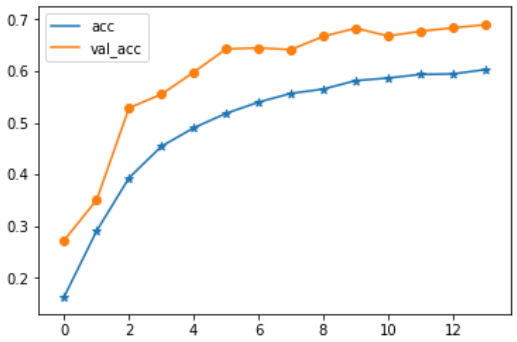
The 3rd fold. Train on 12117 samples, validate on 1515 samples.

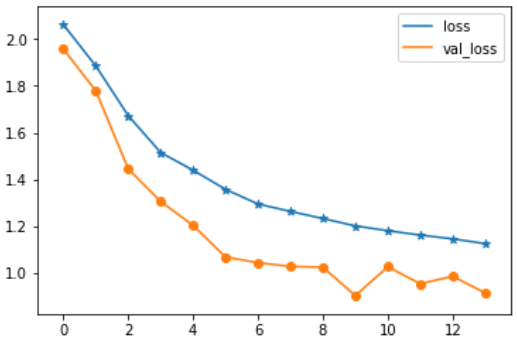




Score log_loss: 0.826048888823

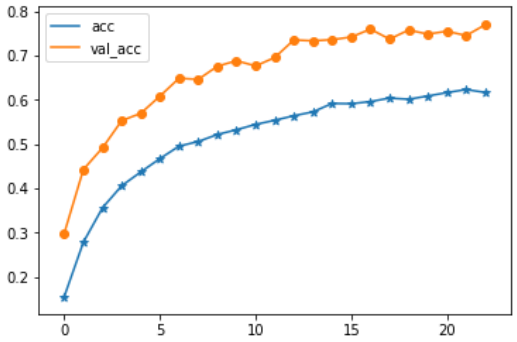
The 4th fold. Train on 12117 samples, validate on 1515 samples.

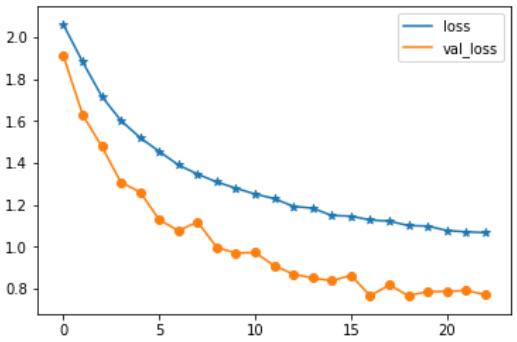




Score log_loss: 0.912774818312

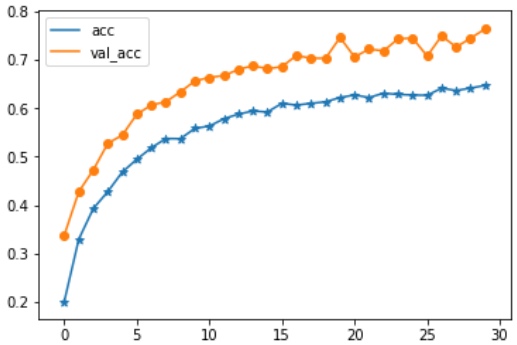
The 5th fold. Train on 12117 samples, validate on 1515 samples.

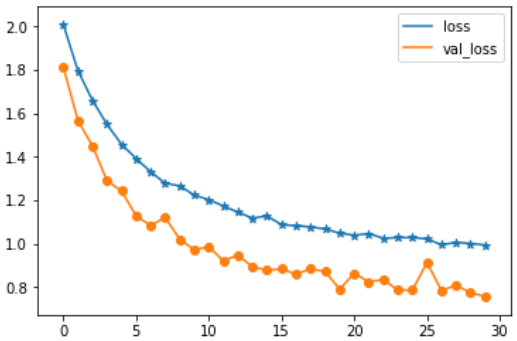




Score log_loss: 0.77100477067

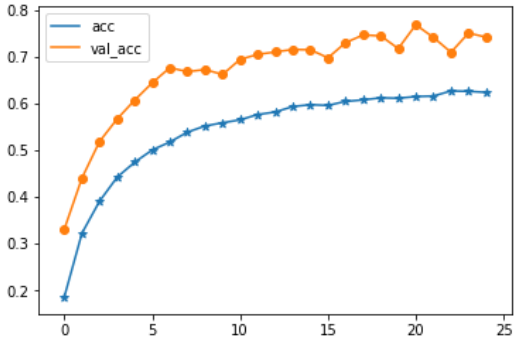
The 6th fold. Train on 12117 samples, validate on 1515 samples.

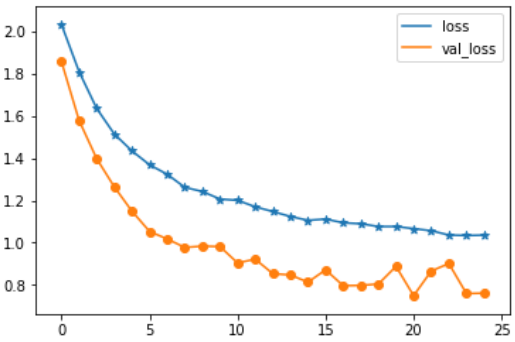




Score log_loss: 0.757442930402

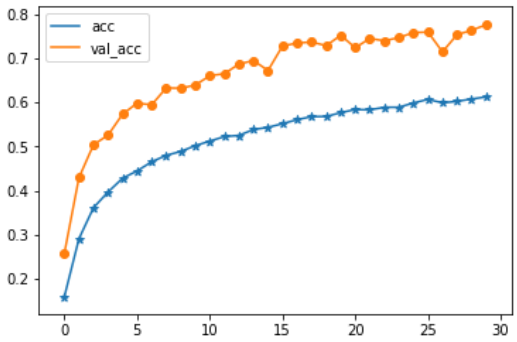
The 7th fold. Train on 12117 samples, validate on 1515 samples.

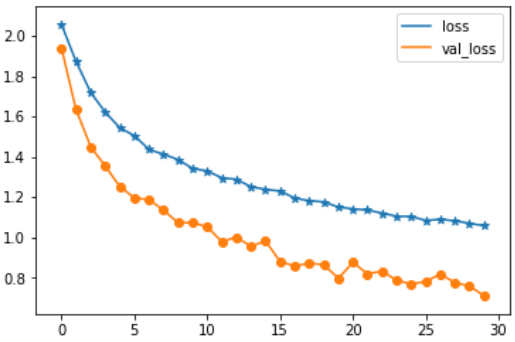




Score log_loss: 0.761502277746

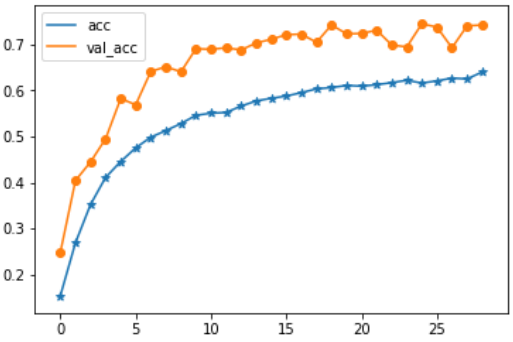
The 8th fold. Train on 12117 samples, validate on 1515 samples.

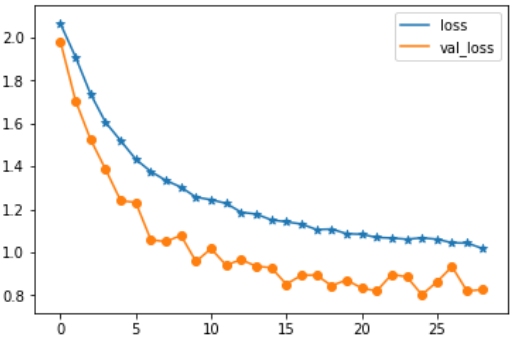




Score log_loss: 0.710213744107

The 9th fold. Train on 12117 samples, validate on 1515 samples.



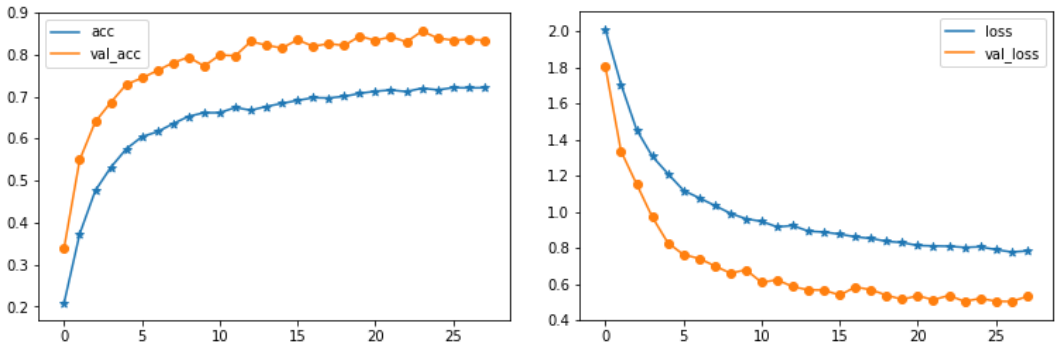


Score log_loss: 0.826420199464

Log_loss train independent avg: 0.799194265061

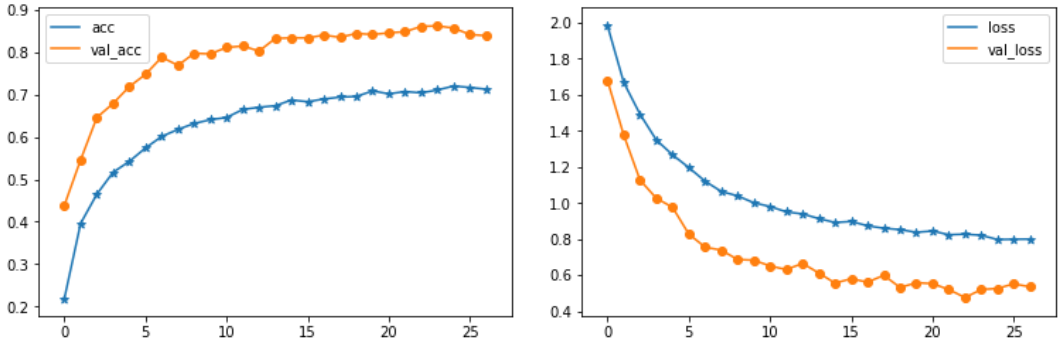
Num_folds=9, batch_size = 32, nb_epoch = 30, CNN 6 layers

The 1st fold. Train on 12117 samples, validate on 1515 samples.



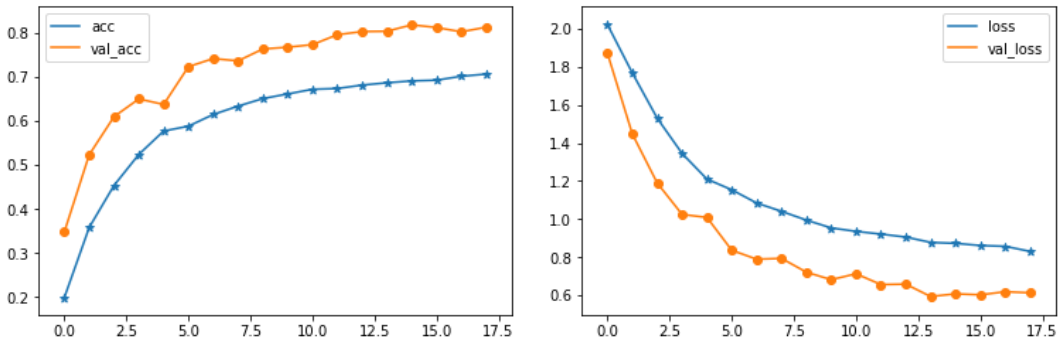
Score log_loss: 0.530585245137

The 2nd fold. Train on 12117 samples, validate on 1515 samples.



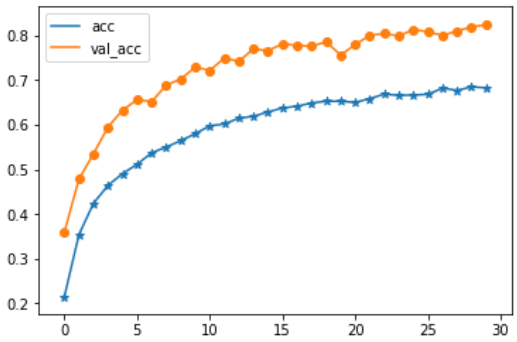
Score log_loss: 0.534486436185

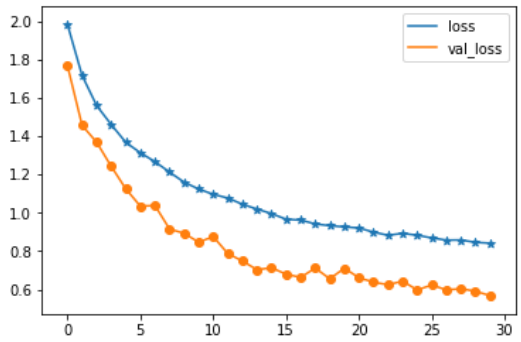
The 3rd fold. Train on 12117 samples, validate on 1515 samples.



Score log_loss: 0.612889229852

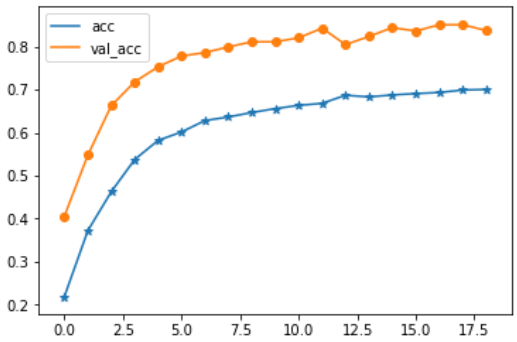
The 4th fold. Train on 12117 samples, validate on 1515 samples.

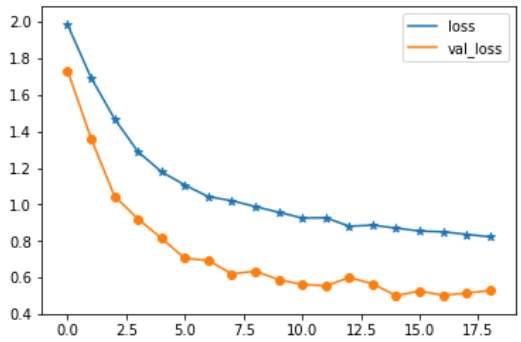




Score log_loss: 0.567197666205

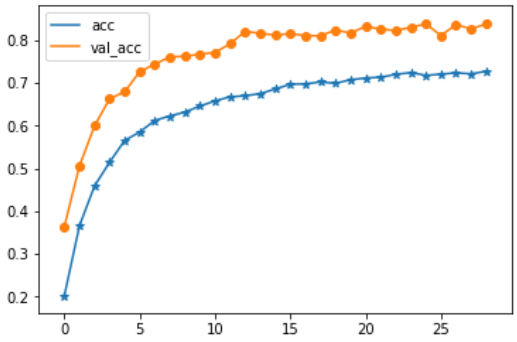
The 5th fold. Train on 12117 samples, validate on 1515 samples.

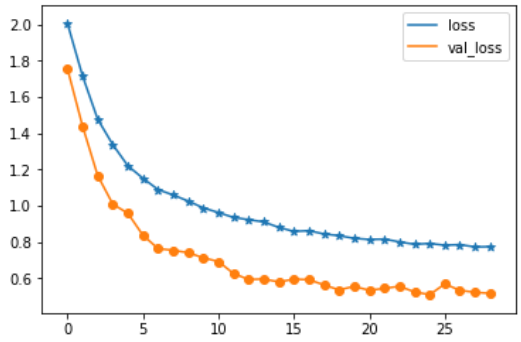




Score log_loss: 0.52929186425

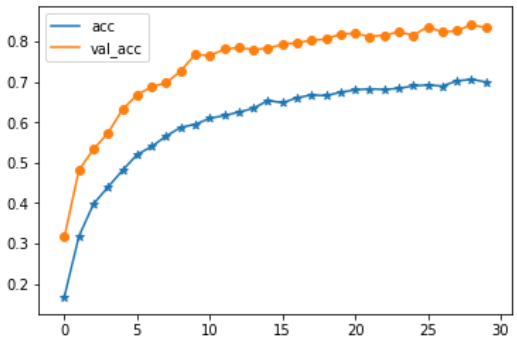
The 6th fold. Train on 12117 samples, validate on 1515 samples.

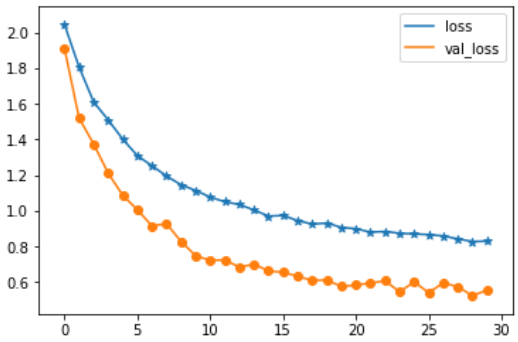




Score log_loss: 0.515508488878

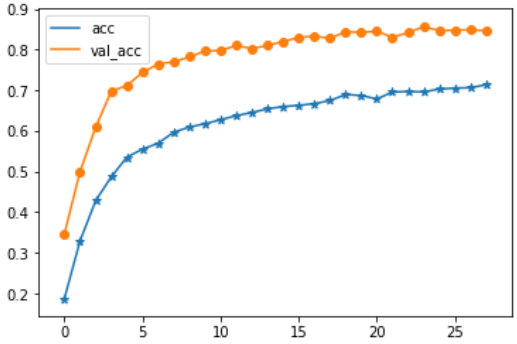
The 7th fold. Train on 12117 samples, validate on 1515 samples.

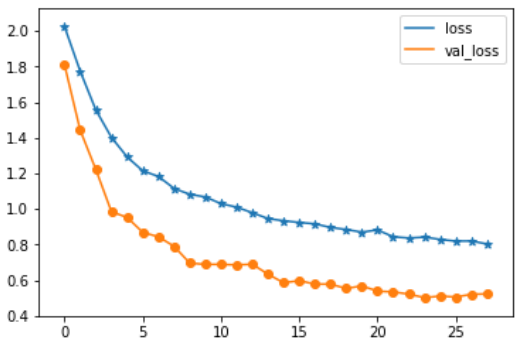




Score log_loss: 0.555241320579

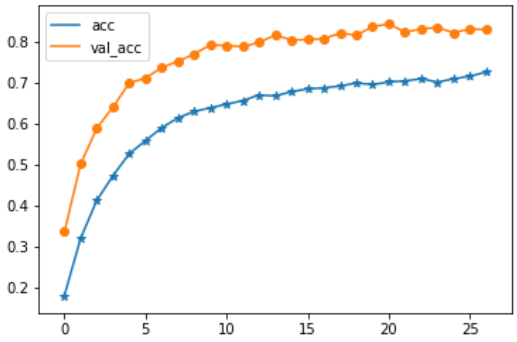
The 8th fold. Train on 12117 samples, validate on 1515 samples.

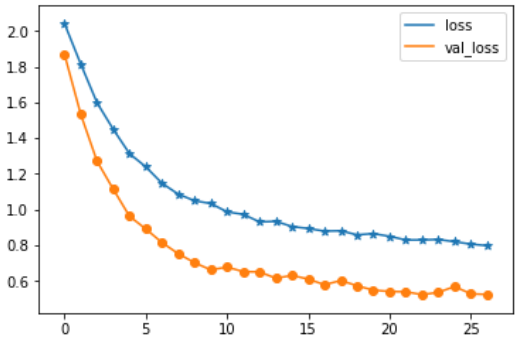




Score log_loss: 0.522596466188

The 9th fold. Train on 12117 samples, validate on 1515 samples.





Score log_loss: 0.524969578752

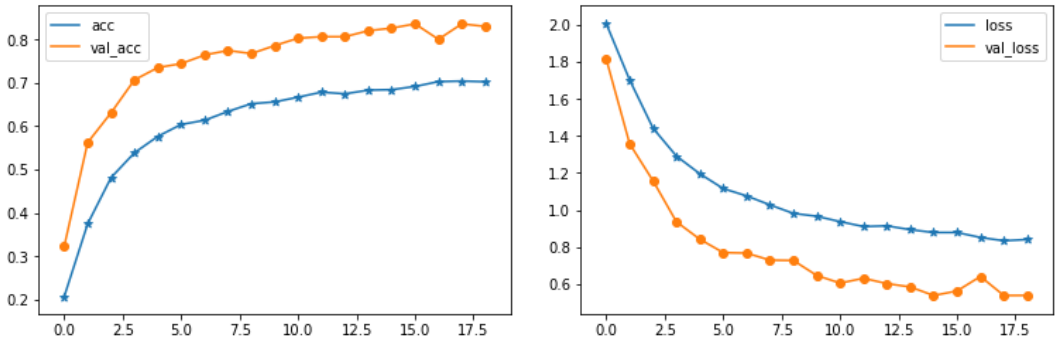
Log_loss train independent avg: 0.543642761965

Model 6 : Data Set Preprocessing + CNN Changeable Layers

Num_folds=9, batch_size = 32, nb_epoch = 30, CNN 6 layers 见上个模型

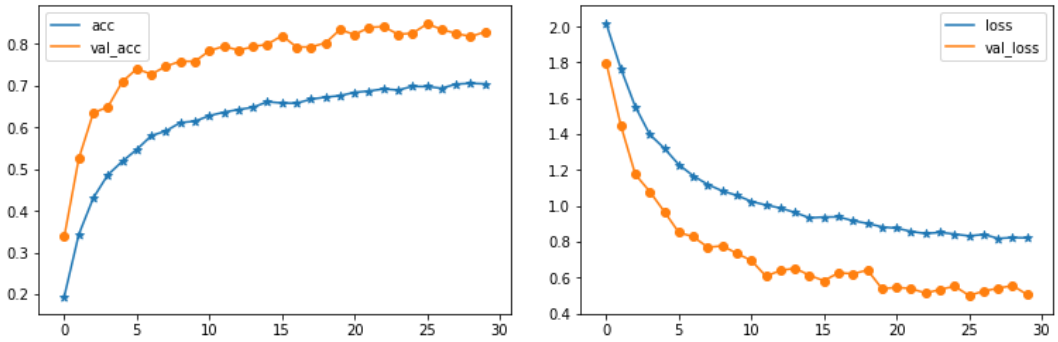
Num_folds=9, batch_size = 32, nb_epoch = 40, CNN 6 layers

The 1st fold. Train on 12117 samples, validate on 1515 samples.



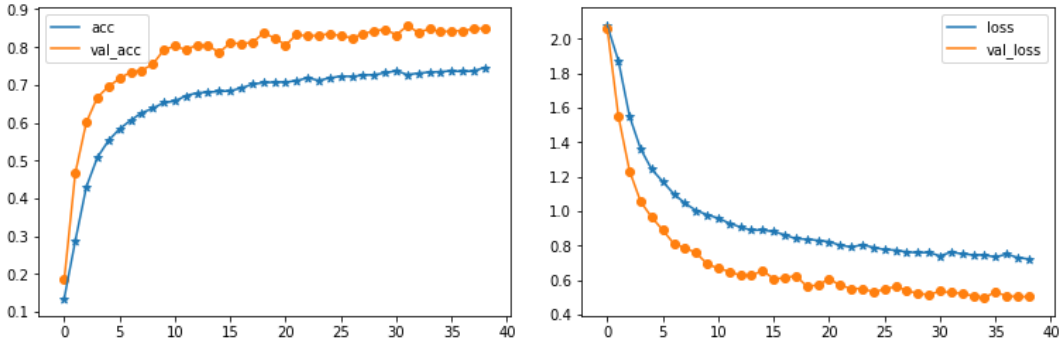
Score log_loss: 0.537487356773

The 2nd fold. Train on 12117 samples, validate on 1515 samples.



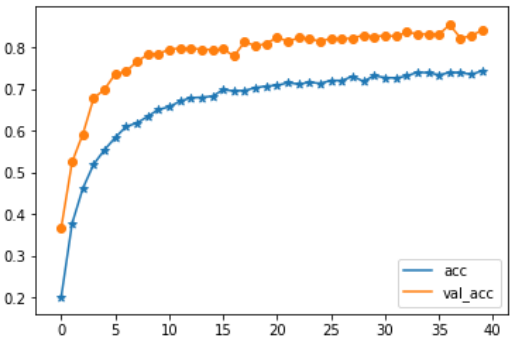
Score log_loss: 0.50546662557

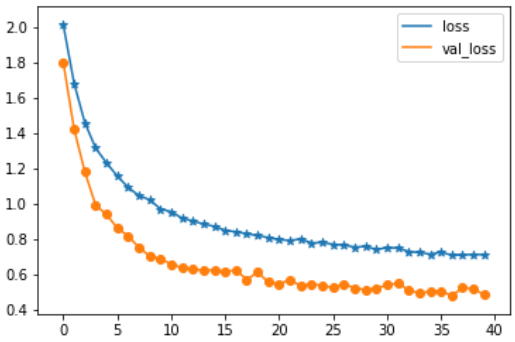
The 3rd fold. Train on 12117 samples, validate on 1515 samples.



Score log_loss: 0.503193028169

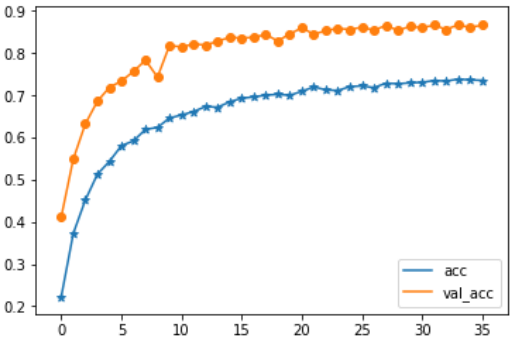
The 4th fold. Train on 12117 samples, validate on 1515 samples.

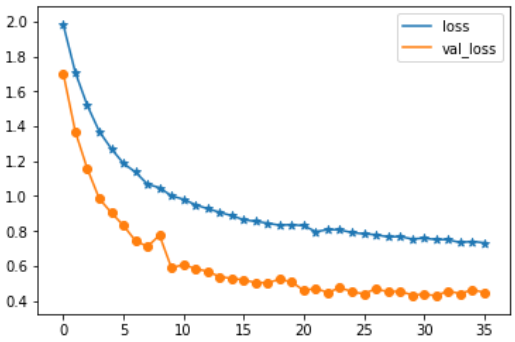




Score log_loss: 0.485411545057

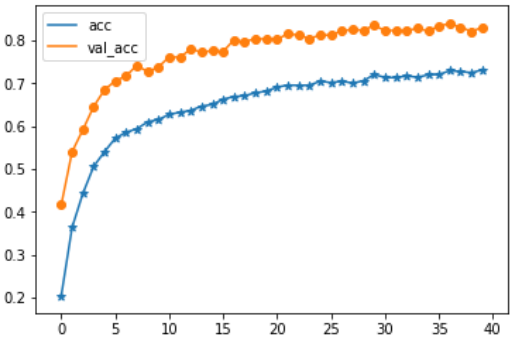
The 5th fold. Train on 12117 samples, validate on 1515 samples.

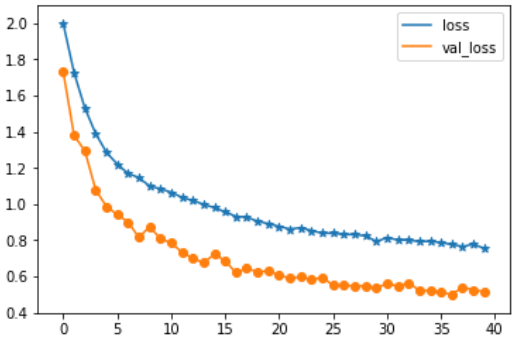




Score log_loss: 0.447823866644

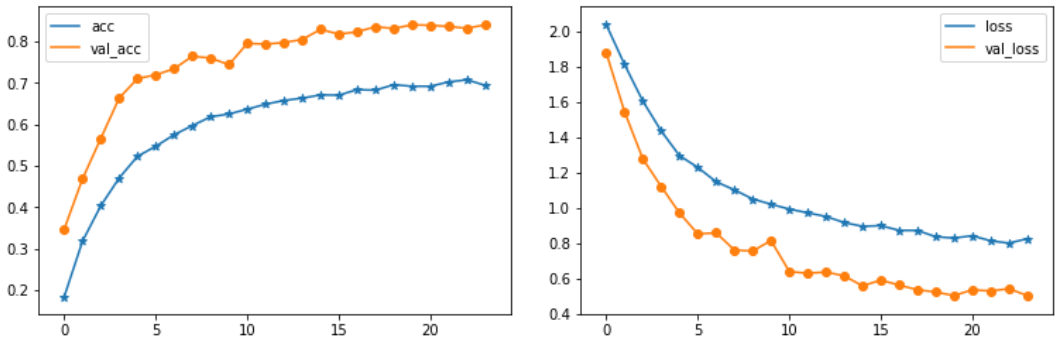
The 6th fold. Train on 12117 samples, validate on 1515 samples.





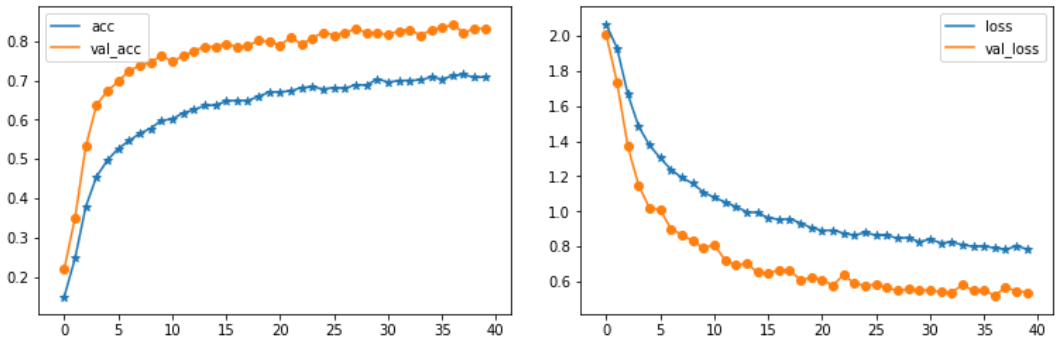
Score log_loss: 0.516524901962

The 7th fold. Train on 12117 samples, validate on 1515 samples.



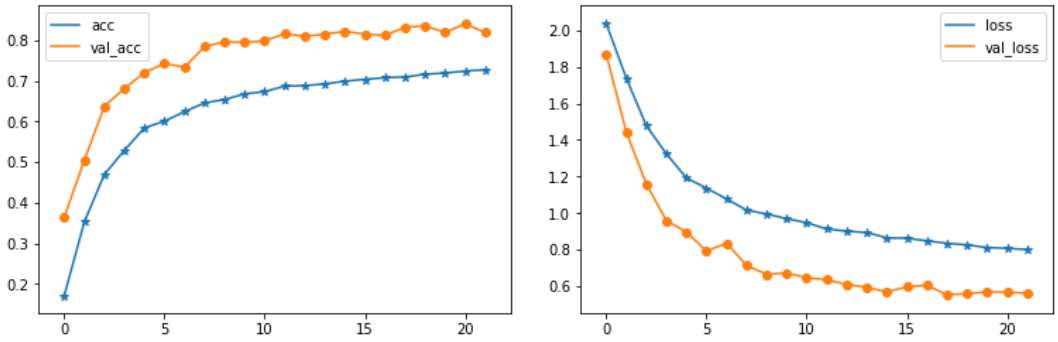
Score log_loss: 0.505010457344

The 8th fold. Train on 12117 samples, validate on 1515 samples.



Score log_loss: 0.537101724417

The 9th fold. Train on 12117 samples, validate on 1515 samples.

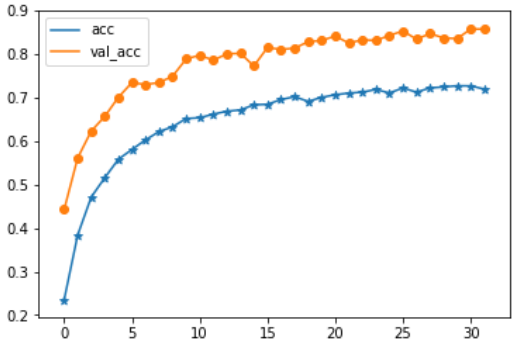


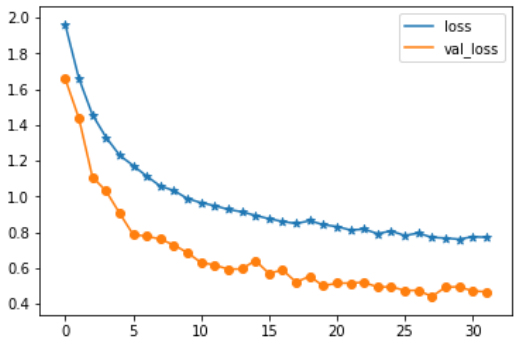
Score log_loss: 0.561537530216

Log_loss train independent avg: 0.511056723889

Num_folds=20, batch_size = 32, nb_epoch = 40, CNN 6 layers

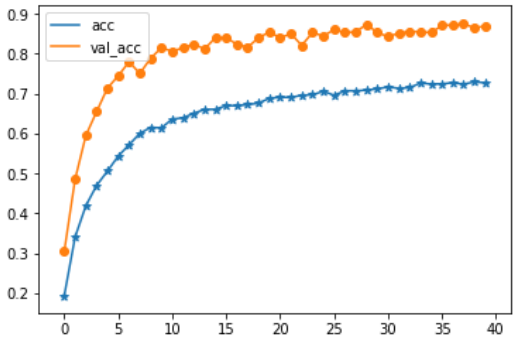
Start KFold number 1 from 20
Split train: 12950 12950
Split valid: 682 682

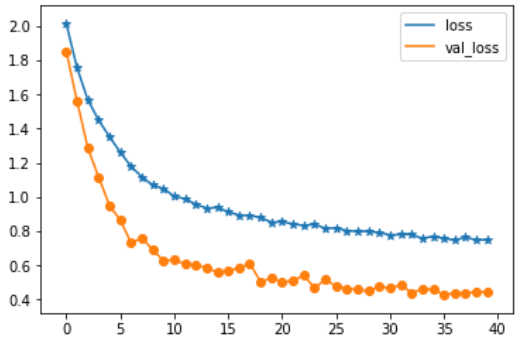




Score log_loss: 0.466676341159

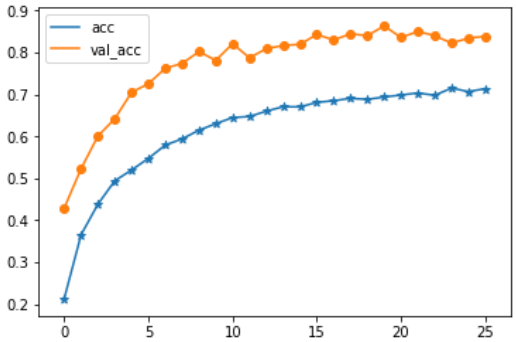
Start KFold number 2 from 20
Split train: 12950 12950
Split valid: 682 682

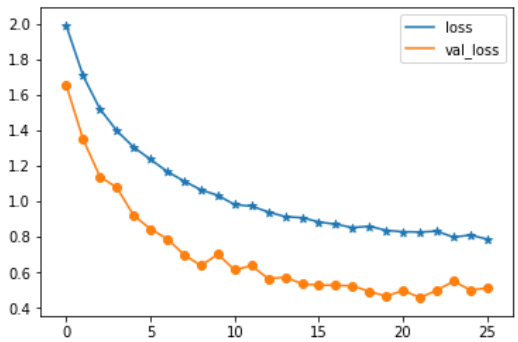




Score log_loss: 0.444404848058

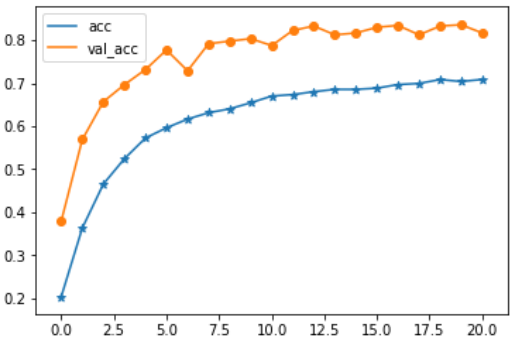
Start KFold number 3 from 20
Split train: 12950 12950
Split valid: 682 682

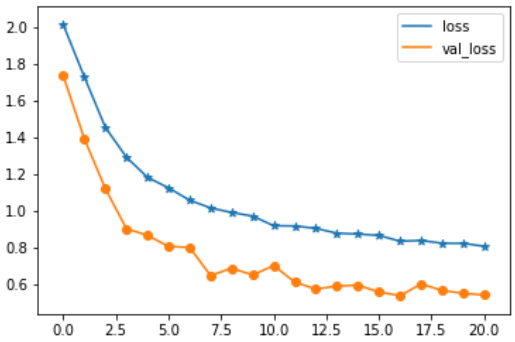




Score log_loss: 0.511347315285

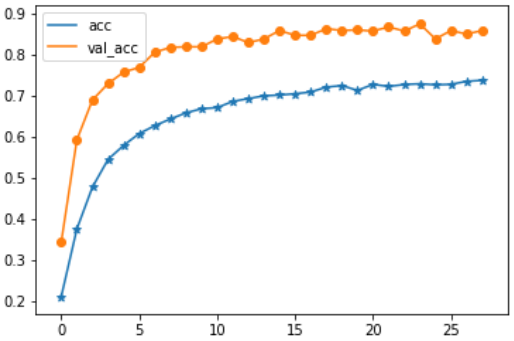
Start KFold number 4 from 20
Split train: 12950 12950
Split valid: 682 682

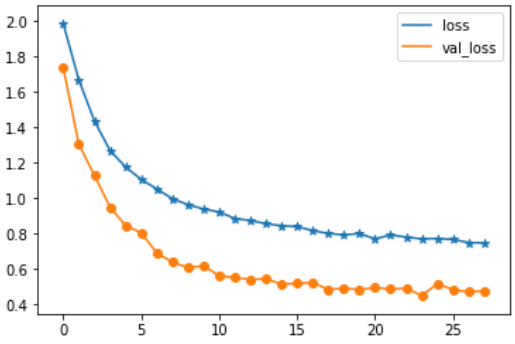




Score log_loss: 0.538885324641

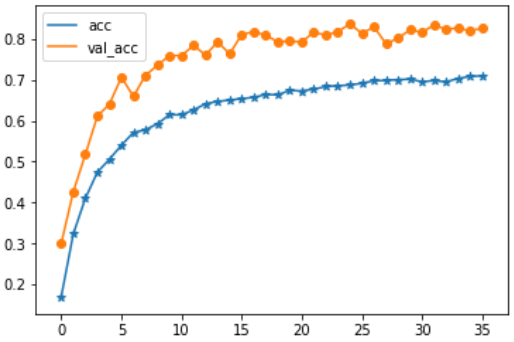
Start KFold number 5 from 20
Split train: 12950 12950
Split valid: 682 682

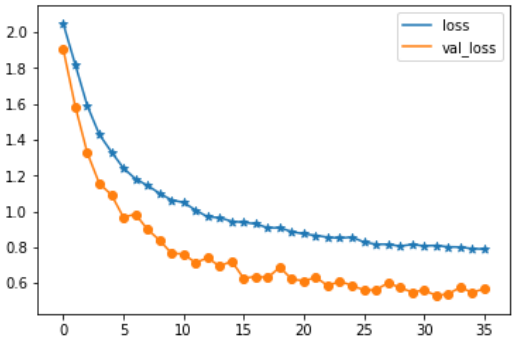




Score log_loss: 0.475941460551

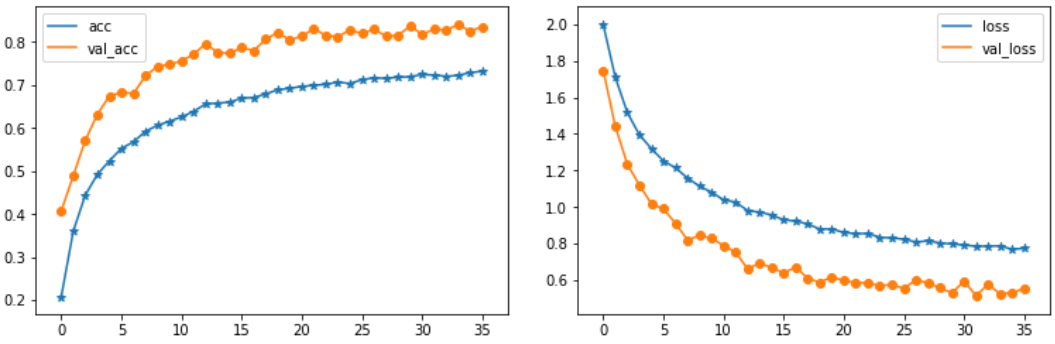
Start KFold number 6 from 20
Split train: 12950 12950
Split valid: 682 682





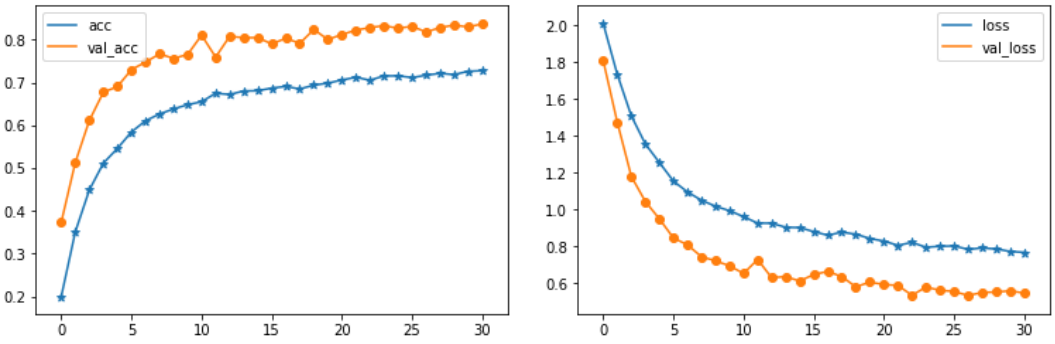
Score log_loss: 0.567559250573

Start KFold number 7 from 20
Split train: 12950 12950
Split valid: 682 682



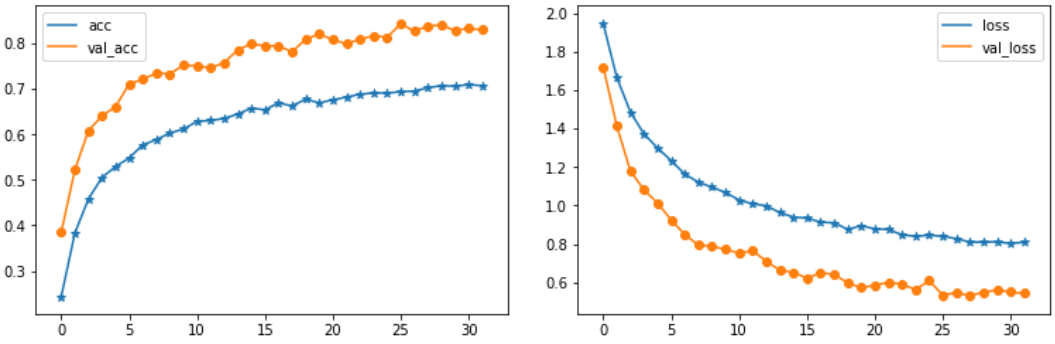
Score log_loss: 0.554854240419

Start KFold number 8 from 20
Split train: 12950 12950
Split valid: 682 682



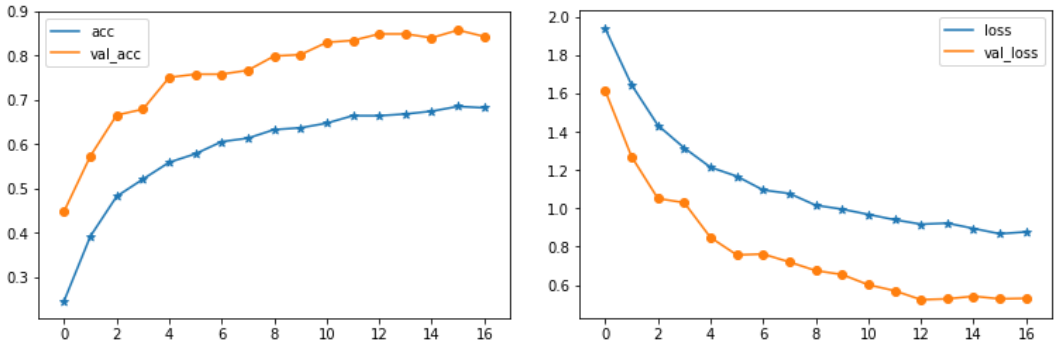
Score log_loss: 0.547703572482

Start KFold number 9 from 20
Split train: 12950 12950
Split valid: 682 682



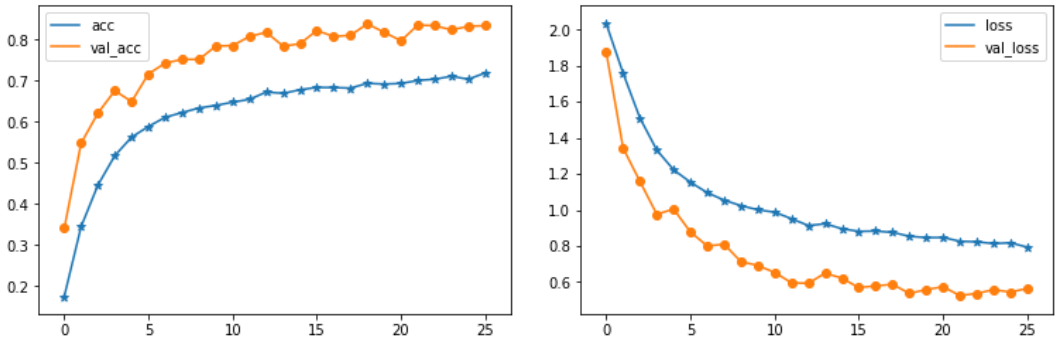
Score log_loss: 0.544005163824

Start KFold number 10 from 20
Split train: 12950 12950
Split valid: 682 682



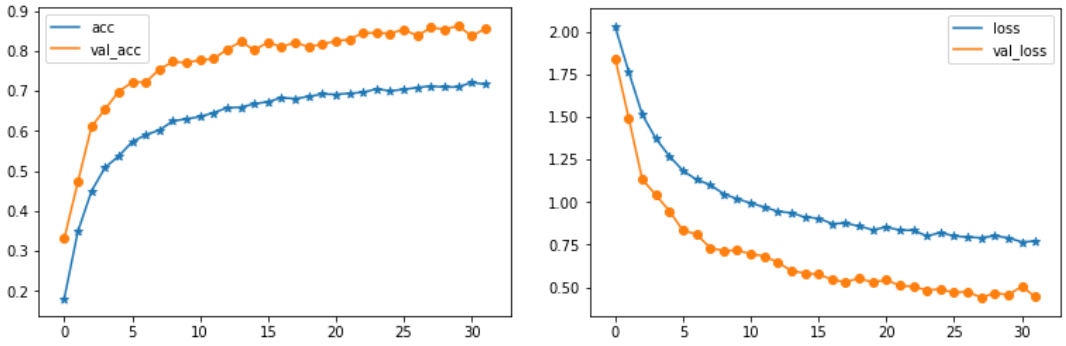
Score log_loss: 0.529728088976

Start KFold number 11 from 20
Split train: 12950 12950
Split valid: 682 682



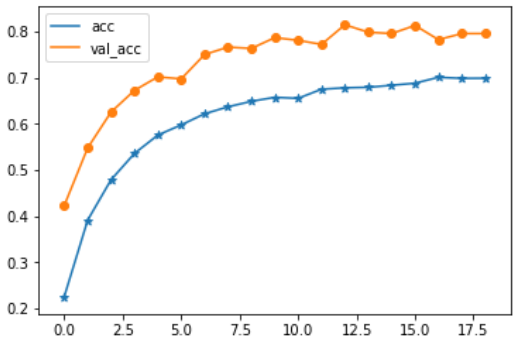
Score log_loss: 0.564599159538

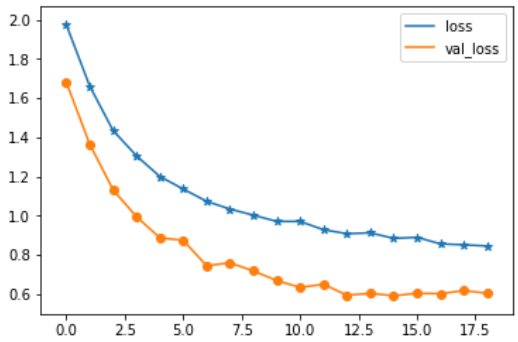
Start KFold number 12 from 20
Split train: 12950 12950
Split valid: 682 682



Score log_loss: 0.443241479233

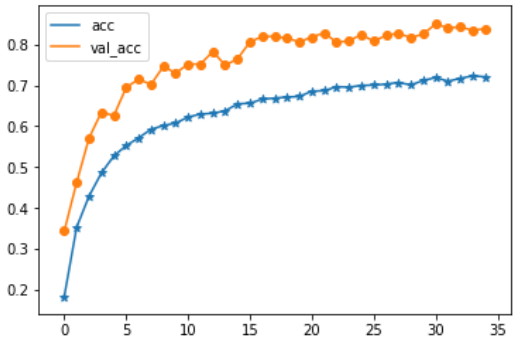
Start KFold number 13 from 20
Split train: 12951 12951
Split valid: 681 681

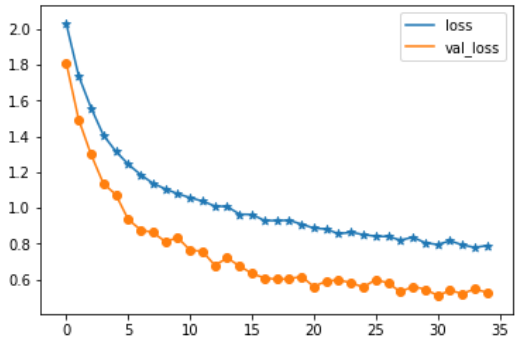




Score log_loss: 0.60388425191

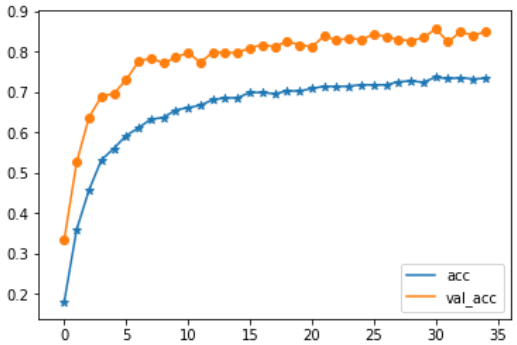
Start KFold number 14 from 20
Split train: 12951 12951
Split valid: 681 681

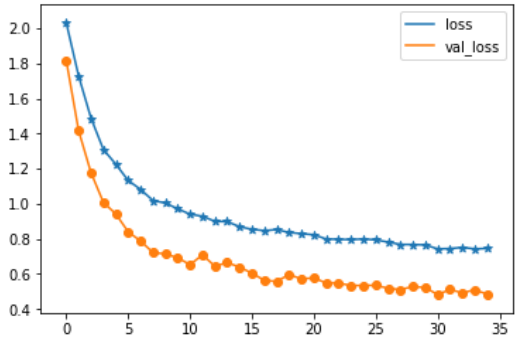




Score log_loss: 0.526043185517

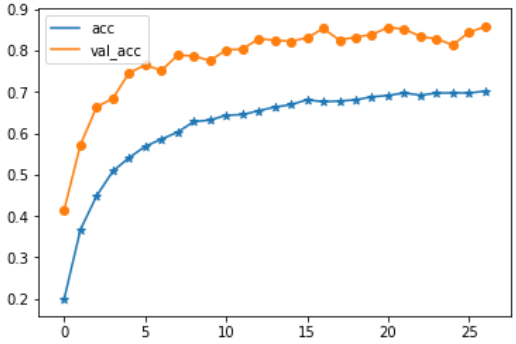
Start KFold number 15 from 20
Split train: 12951 12951
Split valid: 681 681

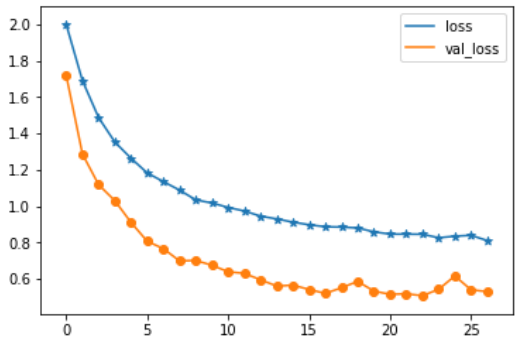




Score log_loss: 0.484392415698

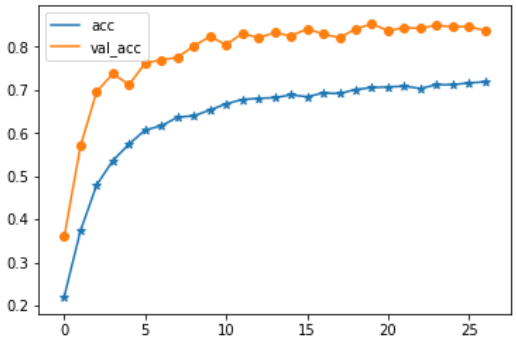
Start KFold number 16 from 20
Split train: 12951 12951
Split valid: 681 681

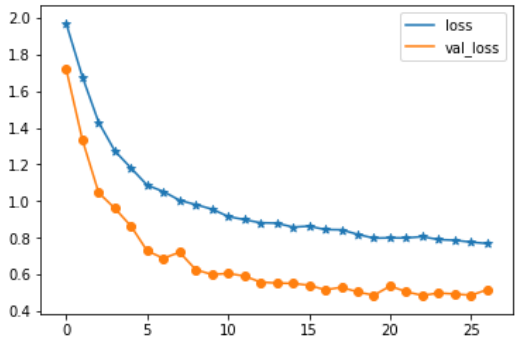




Score log_loss: 0.529066442208

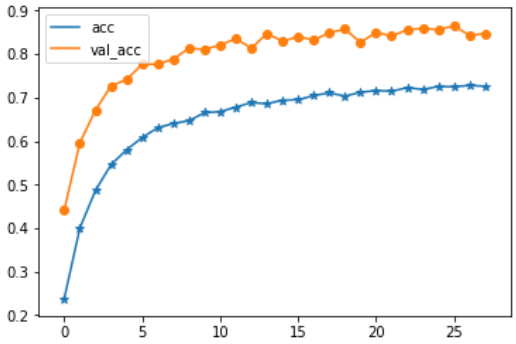
Start KFold number 17 from 20
Split train: 12951 12951
Split valid: 681 681

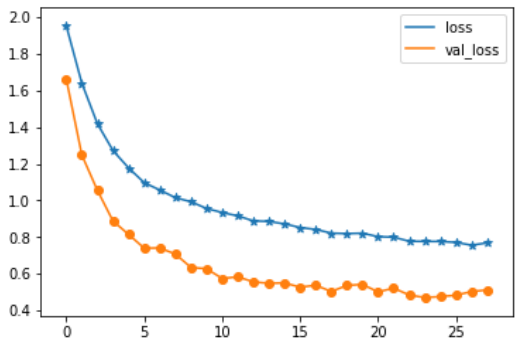




Score log_loss: 0.516335703569

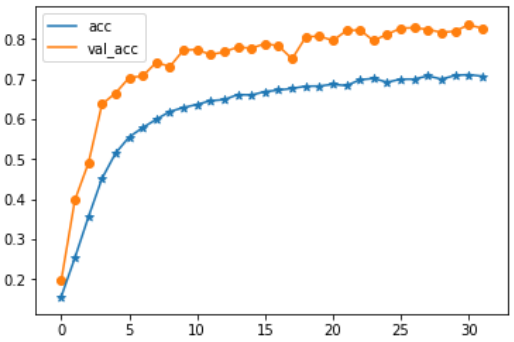
Start KFold number 18 from 20
Split train: 12951 12951
Split valid: 681 681

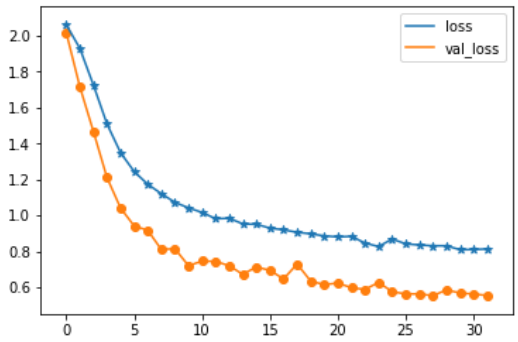




Score log_loss: 0.511137879396

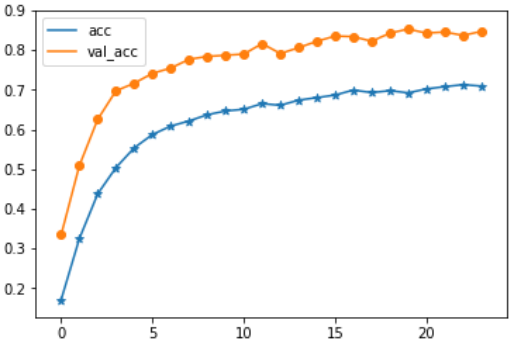
Start KFold number 19 from 20
Split train: 12951 12951
Split valid: 681 681

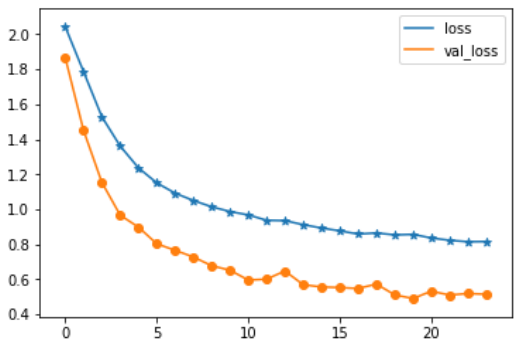




Score log_loss: 0.554950593557

Start KFold number 20 from 20
Split train: 12951 12951
Split valid: 681 681





Score log_loss: 0.513071907838

Log_loss train independent avg: 0.52138646123