WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/tensorflow/python/framework/op\_def\_library.py:263: colocate\_with (from tensorflow.python.framework.ops) is deprecated and will be removed in a future version.  
Instructions for updating:  
Colocations handled automatically by placer.  
WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/keras/backend/tensorflow\_backend.py:3445: calling dropout (from tensorflow.python.ops.nn\_ops) with keep\_prob is deprecated and will be removed in a future version.  
Instructions for updating:  
Please use `rate` instead of `keep\_prob`. Rate should be set to `rate = 1 - keep\_prob`.  
WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/tensorflow/python/ops/math\_ops.py:3066: to\_int32 (from tensorflow.python.ops.math\_ops) is deprecated and will be removed in a future version.  
Instructions for updating:  
Use tf.cast instead.  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4952 - acc: 0.2556 - val\_loss: 0.4908 - val\_acc: 0.2821  
Epoch 2/20  
 - 0s - loss: 0.4798 - acc: 0.3722 - val\_loss: 0.4659 - val\_acc: 0.4615  
Epoch 3/20  
 - 0s - loss: 0.4505 - acc: 0.5389 - val\_loss: 0.4352 - val\_acc: 0.5513  
Epoch 4/20  
 - 0s - loss: 0.4172 - acc: 0.6222 - val\_loss: 0.4044 - val\_acc: 0.6538  
Epoch 5/20  
 - 0s - loss: 0.3851 - acc: 0.6667 - val\_loss: 0.3759 - val\_acc: 0.6923  
Epoch 6/20  
 - 0s - loss: 0.3595 - acc: 0.7056 - val\_loss: 0.3514 - val\_acc: 0.7436  
Epoch 7/20  
 - 0s - loss: 0.3360 - acc: 0.7222 - val\_loss: 0.3303 - val\_acc: 0.7692  
Epoch 8/20  
 - 0s - loss: 0.3231 - acc: 0.7500 - val\_loss: 0.3132 - val\_acc: 0.7821  
Epoch 9/20  
 - 0s - loss: 0.3089 - acc: 0.7389 - val\_loss: 0.2994 - val\_acc: 0.7949  
Epoch 10/20  
 - 0s - loss: 0.3108 - acc: 0.7611 - val\_loss: 0.2888 - val\_acc: 0.8077  
Epoch 11/20  
 - 0s - loss: 0.2860 - acc: 0.7444 - val\_loss: 0.2803 - val\_acc: 0.8077  
Epoch 12/20  
 - 0s - loss: 0.2812 - acc: 0.7667 - val\_loss: 0.2720 - val\_acc: 0.8077  
Epoch 13/20  
 - 0s - loss: 0.2764 - acc: 0.7556 - val\_loss: 0.2641 - val\_acc: 0.7949  
Epoch 14/20  
 - 0s - loss: 0.2685 - acc: 0.7611 - val\_loss: 0.2539 - val\_acc: 0.7949  
Epoch 15/20  
 - 0s - loss: 0.2487 - acc: 0.7889 - val\_loss: 0.2372 - val\_acc: 0.8205  
Epoch 16/20  
 - 0s - loss: 0.2541 - acc: 0.7944 - val\_loss: 0.2277 - val\_acc: 0.8077  
Epoch 17/20  
 - 0s - loss: 0.2280 - acc: 0.8333 - val\_loss: 0.2204 - val\_acc: 0.8333  
Epoch 18/20  
 - 0s - loss: 0.2232 - acc: 0.8444 - val\_loss: 0.2140 - val\_acc: 0.8333  
Epoch 19/20  
 - 0s - loss: 0.2149 - acc: 0.8722 - val\_loss: 0.2058 - val\_acc: 0.8846  
Epoch 20/20  
 - 0s - loss: 0.2183 - acc: 0.8889 - val\_loss: 0.1997 - val\_acc: 0.8718  
86/86 [==============================] - 0s 112us/step  
acc: 86.05%  
(344, 36)  
(344, 11)  
11  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 0s - loss: 0.4949 - acc: 0.2500 - val\_loss: 0.4919 - val\_acc: 0.1923  
Epoch 2/20  
 - 0s - loss: 0.4832 - acc: 0.3833 - val\_loss: 0.4736 - val\_acc: 0.4487  
Epoch 3/20  
 - 0s - loss: 0.4609 - acc: 0.4556 - val\_loss: 0.4479 - val\_acc: 0.5897  
Epoch 4/20  
 - 0s - loss: 0.4324 - acc: 0.6278 - val\_loss: 0.4188 - val\_acc: 0.6667  
Epoch 5/20  
 - 0s - loss: 0.3998 - acc: 0.7000 - val\_loss: 0.3892 - val\_acc: 0.7308  
Epoch 6/20  
 - 0s - loss: 0.3697 - acc: 0.7222 - val\_loss: 0.3612 - val\_acc: 0.7436  
Epoch 7/20  
 - 0s - loss: 0.3478 - acc: 0.7167 - val\_loss: 0.3370 - val\_acc: 0.7436  
Epoch 8/20  
 - 0s - loss: 0.3245 - acc: 0.7500 - val\_loss: 0.3171 - val\_acc: 0.7564  
Epoch 9/20  
 - 0s - loss: 0.3112 - acc: 0.7389 - val\_loss: 0.3009 - val\_acc: 0.7692  
Epoch 10/20  
 - 0s - loss: 0.3074 - acc: 0.7500 - val\_loss: 0.2875 - val\_acc: 0.7692  
Epoch 11/20  
 - 0s - loss: 0.2876 - acc: 0.7556 - val\_loss: 0.2769 - val\_acc: 0.7821  
Epoch 12/20  
 - 0s - loss: 0.2805 - acc: 0.7500 - val\_loss: 0.2672 - val\_acc: 0.7821  
Epoch 13/20  
 - 0s - loss: 0.2700 - acc: 0.7556 - val\_loss: 0.2579 - val\_acc: 0.8077  
Epoch 14/20  
 - 0s - loss: 0.2655 - acc: 0.7611 - val\_loss: 0.2435 - val\_acc: 0.7949  
Epoch 15/20  
 - 0s - loss: 0.2467 - acc: 0.8111 - val\_loss: 0.2323 - val\_acc: 0.8462  
Epoch 16/20  
 - 0s - loss: 0.2520 - acc: 0.7889 - val\_loss: 0.2241 - val\_acc: 0.8590  
Epoch 17/20  
 - 0s - loss: 0.2308 - acc: 0.8222 - val\_loss: 0.2174 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2312 - acc: 0.8667 - val\_loss: 0.2112 - val\_acc: 0.8590  
Epoch 19/20  
 - 0s - loss: 0.2160 - acc: 0.8667 - val\_loss: 0.2045 - val\_acc: 0.8590  
Epoch 20/20  
 - 0s - loss: 0.2156 - acc: 0.8667 - val\_loss: 0.1980 - val\_acc: 0.8718  
86/86 [==============================] - 0s 102us/step  
acc: 86.05%  
(344, 36)  
(344, 22)  
22  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 0s - loss: 0.4914 - acc: 0.2833 - val\_loss: 0.4839 - val\_acc: 0.1282  
Epoch 2/20  
 - 0s - loss: 0.4755 - acc: 0.2389 - val\_loss: 0.4701 - val\_acc: 0.1410  
Epoch 3/20  
 - 0s - loss: 0.4668 - acc: 0.2667 - val\_loss: 0.4592 - val\_acc: 0.1795  
Epoch 4/20  
 - 0s - loss: 0.4524 - acc: 0.3000 - val\_loss: 0.4493 - val\_acc: 0.1923  
Epoch 5/20  
 - 0s - loss: 0.4436 - acc: 0.3500 - val\_loss: 0.4351 - val\_acc: 0.3846  
Epoch 6/20  
 - 0s - loss: 0.4198 - acc: 0.5500 - val\_loss: 0.3984 - val\_acc: 0.7051  
Epoch 7/20  
 - 0s - loss: 0.3773 - acc: 0.7389 - val\_loss: 0.3465 - val\_acc: 0.7821  
Epoch 8/20  
 - 0s - loss: 0.3315 - acc: 0.7944 - val\_loss: 0.3027 - val\_acc: 0.8077  
Epoch 9/20  
 - 0s - loss: 0.2964 - acc: 0.8111 - val\_loss: 0.2744 - val\_acc: 0.8205  
Epoch 10/20  
 - 0s - loss: 0.2940 - acc: 0.8500 - val\_loss: 0.2565 - val\_acc: 0.8333  
Epoch 11/20  
 - 0s - loss: 0.2663 - acc: 0.8667 - val\_loss: 0.2428 - val\_acc: 0.8462  
Epoch 12/20  
 - 0s - loss: 0.2528 - acc: 0.8833 - val\_loss: 0.2307 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2229 - acc: 0.8833 - val\_loss: 0.2203 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2321 - acc: 0.8889 - val\_loss: 0.2108 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2189 - acc: 0.8889 - val\_loss: 0.2023 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2244 - acc: 0.8889 - val\_loss: 0.1947 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2263 - acc: 0.8889 - val\_loss: 0.1892 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2040 - acc: 0.8889 - val\_loss: 0.1855 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.1839 - acc: 0.8889 - val\_loss: 0.1795 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2100 - acc: 0.8889 - val\_loss: 0.1762 - val\_acc: 0.8718  
86/86 [==============================] - 0s 104us/step  
acc: 16.28%  
(344, 36)  
(344, 16)  
16  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 0s - loss: 0.4936 - acc: 0.3167 - val\_loss: 0.4888 - val\_acc: 0.2821  
Epoch 2/20  
 - 0s - loss: 0.4761 - acc: 0.4500 - val\_loss: 0.4664 - val\_acc: 0.4872  
Epoch 3/20  
 - 0s - loss: 0.4488 - acc: 0.5222 - val\_loss: 0.4375 - val\_acc: 0.5897  
Epoch 4/20  
 - 0s - loss: 0.4154 - acc: 0.6111 - val\_loss: 0.4072 - val\_acc: 0.6538  
Epoch 5/20  
 - 0s - loss: 0.3833 - acc: 0.6833 - val\_loss: 0.3791 - val\_acc: 0.6923  
Epoch 6/20  
 - 0s - loss: 0.3573 - acc: 0.7000 - val\_loss: 0.3535 - val\_acc: 0.7179  
Epoch 7/20  
 - 0s - loss: 0.3338 - acc: 0.7111 - val\_loss: 0.3321 - val\_acc: 0.7308  
Epoch 8/20  
 - 0s - loss: 0.3176 - acc: 0.7222 - val\_loss: 0.3156 - val\_acc: 0.7436  
Epoch 9/20  
 - 0s - loss: 0.3088 - acc: 0.7389 - val\_loss: 0.3027 - val\_acc: 0.7308  
Epoch 10/20  
 - 0s - loss: 0.3185 - acc: 0.7667 - val\_loss: 0.2927 - val\_acc: 0.7436  
Epoch 11/20  
 - 0s - loss: 0.2867 - acc: 0.7444 - val\_loss: 0.2842 - val\_acc: 0.7564  
Epoch 12/20  
 - 0s - loss: 0.2858 - acc: 0.7556 - val\_loss: 0.2763 - val\_acc: 0.7692  
Epoch 13/20  
 - 0s - loss: 0.2752 - acc: 0.7444 - val\_loss: 0.2680 - val\_acc: 0.7949  
Epoch 14/20  
 - 0s - loss: 0.2672 - acc: 0.7556 - val\_loss: 0.2586 - val\_acc: 0.7949  
Epoch 15/20  
 - 0s - loss: 0.2544 - acc: 0.7944 - val\_loss: 0.2470 - val\_acc: 0.7821  
Epoch 16/20  
 - 0s - loss: 0.2586 - acc: 0.7722 - val\_loss: 0.2336 - val\_acc: 0.8590  
Epoch 17/20  
 - 0s - loss: 0.2337 - acc: 0.8389 - val\_loss: 0.2253 - val\_acc: 0.8846  
Epoch 18/20  
 - 0s - loss: 0.2291 - acc: 0.8722 - val\_loss: 0.2178 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2155 - acc: 0.8778 - val\_loss: 0.2098 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2176 - acc: 0.8889 - val\_loss: 0.2038 - val\_acc: 0.8718  
86/86 [==============================] - 0s 120us/step  
acc: 86.05%  
(344, 36)  
(344, 22)  
22  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 0s - loss: 0.4947 - acc: 0.3000 - val\_loss: 0.4912 - val\_acc: 0.1154  
Epoch 2/20  
 - 0s - loss: 0.4843 - acc: 0.3111 - val\_loss: 0.4818 - val\_acc: 0.2436  
Epoch 3/20  
 - 0s - loss: 0.4559 - acc: 0.4444 - val\_loss: 0.4504 - val\_acc: 0.5385  
Epoch 4/20  
 - 0s - loss: 0.4193 - acc: 0.6389 - val\_loss: 0.4070 - val\_acc: 0.6795  
Epoch 5/20  
 - 0s - loss: 0.3803 - acc: 0.7333 - val\_loss: 0.3641 - val\_acc: 0.7564  
Epoch 6/20  
 - 0s - loss: 0.3362 - acc: 0.7667 - val\_loss: 0.3264 - val\_acc: 0.8077  
Epoch 7/20  
 - 0s - loss: 0.3115 - acc: 0.8056 - val\_loss: 0.2987 - val\_acc: 0.8590  
Epoch 8/20  
 - 0s - loss: 0.3005 - acc: 0.8333 - val\_loss: 0.2798 - val\_acc: 0.8590  
Epoch 9/20  
 - 0s - loss: 0.2784 - acc: 0.8389 - val\_loss: 0.2653 - val\_acc: 0.8718  
Epoch 10/20  
 - 0s - loss: 0.2939 - acc: 0.8389 - val\_loss: 0.2539 - val\_acc: 0.8846  
Epoch 11/20  
 - 0s - loss: 0.2703 - acc: 0.8444 - val\_loss: 0.2449 - val\_acc: 0.8718  
Epoch 12/20  
 - 0s - loss: 0.2651 - acc: 0.8722 - val\_loss: 0.2370 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2366 - acc: 0.8833 - val\_loss: 0.2287 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2303 - acc: 0.8722 - val\_loss: 0.2199 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2331 - acc: 0.8722 - val\_loss: 0.2110 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2306 - acc: 0.8778 - val\_loss: 0.2049 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2210 - acc: 0.8833 - val\_loss: 0.2009 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2009 - acc: 0.8944 - val\_loss: 0.1978 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2008 - acc: 0.8833 - val\_loss: 0.1902 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2084 - acc: 0.8833 - val\_loss: 0.1844 - val\_acc: 0.8718  
86/86 [==============================] - 0s 116us/step  
acc: 86.05%  
(344, 36)  
(344, 19)  
19  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 0s - loss: 0.4937 - acc: 0.3222 - val\_loss: 0.4892 - val\_acc: 0.2821  
Epoch 2/20  
 - 0s - loss: 0.4752 - acc: 0.4611 - val\_loss: 0.4613 - val\_acc: 0.5641  
Epoch 3/20  
 - 0s - loss: 0.4449 - acc: 0.6056 - val\_loss: 0.4280 - val\_acc: 0.6538  
Epoch 4/20  
 - 0s - loss: 0.4062 - acc: 0.6667 - val\_loss: 0.3936 - val\_acc: 0.7051  
Epoch 5/20  
 - 0s - loss: 0.3768 - acc: 0.6778 - val\_loss: 0.3648 - val\_acc: 0.7179  
Epoch 6/20  
 - 0s - loss: 0.3484 - acc: 0.6833 - val\_loss: 0.3382 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3350 - acc: 0.6944 - val\_loss: 0.3173 - val\_acc: 0.7436  
Epoch 8/20  
 - 0s - loss: 0.3053 - acc: 0.7000 - val\_loss: 0.2966 - val\_acc: 0.7564  
Epoch 9/20  
 - 0s - loss: 0.3049 - acc: 0.7222 - val\_loss: 0.2775 - val\_acc: 0.7949  
Epoch 10/20  
 - 0s - loss: 0.3008 - acc: 0.7333 - val\_loss: 0.2614 - val\_acc: 0.7949  
Epoch 11/20  
 - 0s - loss: 0.2657 - acc: 0.7389 - val\_loss: 0.2477 - val\_acc: 0.7821  
Epoch 12/20  
 - 0s - loss: 0.2612 - acc: 0.8333 - val\_loss: 0.2361 - val\_acc: 0.8462  
Epoch 13/20  
 - 0s - loss: 0.2424 - acc: 0.8444 - val\_loss: 0.2260 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2404 - acc: 0.8778 - val\_loss: 0.2171 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2277 - acc: 0.8889 - val\_loss: 0.2098 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2352 - acc: 0.8889 - val\_loss: 0.2038 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2132 - acc: 0.8889 - val\_loss: 0.1989 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2179 - acc: 0.8889 - val\_loss: 0.1938 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2099 - acc: 0.8889 - val\_loss: 0.1884 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2202 - acc: 0.8889 - val\_loss: 0.1836 - val\_acc: 0.8718  
86/86 [==============================] - 0s 131us/step  
acc: 86.05%  
(344, 36)  
(344, 20)  
20  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 0s - loss: 0.4943 - acc: 0.2500 - val\_loss: 0.4907 - val\_acc: 0.2564  
Epoch 2/20  
 - 0s - loss: 0.4771 - acc: 0.4444 - val\_loss: 0.4635 - val\_acc: 0.5000  
Epoch 3/20  
 - 0s - loss: 0.4440 - acc: 0.5667 - val\_loss: 0.4277 - val\_acc: 0.6667  
Epoch 4/20  
 - 0s - loss: 0.4053 - acc: 0.6611 - val\_loss: 0.3924 - val\_acc: 0.7179  
Epoch 5/20  
 - 0s - loss: 0.3716 - acc: 0.6722 - val\_loss: 0.3624 - val\_acc: 0.7436  
Epoch 6/20  
 - 0s - loss: 0.3462 - acc: 0.7056 - val\_loss: 0.3378 - val\_acc: 0.7692  
Epoch 7/20  
 - 0s - loss: 0.3327 - acc: 0.7167 - val\_loss: 0.3192 - val\_acc: 0.7692  
Epoch 8/20  
 - 0s - loss: 0.3192 - acc: 0.7333 - val\_loss: 0.3069 - val\_acc: 0.7692  
Epoch 9/20  
 - 0s - loss: 0.3064 - acc: 0.7389 - val\_loss: 0.2973 - val\_acc: 0.7821  
Epoch 10/20  
 - 0s - loss: 0.3131 - acc: 0.7333 - val\_loss: 0.2893 - val\_acc: 0.7692  
Epoch 11/20  
 - 0s - loss: 0.2872 - acc: 0.7444 - val\_loss: 0.2812 - val\_acc: 0.7692  
Epoch 12/20  
 - 0s - loss: 0.2842 - acc: 0.7667 - val\_loss: 0.2719 - val\_acc: 0.7692  
Epoch 13/20  
 - 0s - loss: 0.2740 - acc: 0.7556 - val\_loss: 0.2616 - val\_acc: 0.7692  
Epoch 14/20  
 - 0s - loss: 0.2620 - acc: 0.7667 - val\_loss: 0.2467 - val\_acc: 0.8077  
Epoch 15/20  
 - 0s - loss: 0.2464 - acc: 0.8111 - val\_loss: 0.2342 - val\_acc: 0.8333  
Epoch 16/20  
 - 0s - loss: 0.2504 - acc: 0.8056 - val\_loss: 0.2247 - val\_acc: 0.8462  
Epoch 17/20  
 - 0s - loss: 0.2306 - acc: 0.8167 - val\_loss: 0.2164 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2238 - acc: 0.8500 - val\_loss: 0.2086 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2108 - acc: 0.8556 - val\_loss: 0.2006 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2200 - acc: 0.8889 - val\_loss: 0.1957 - val\_acc: 0.8718  
86/86 [==============================] - 0s 121us/step  
acc: 86.05%  
(344, 36)  
(344, 14)  
14  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4963 - acc: 0.2611 - val\_loss: 0.4941 - val\_acc: 0.1282  
Epoch 2/20  
 - 0s - loss: 0.4864 - acc: 0.3500 - val\_loss: 0.4777 - val\_acc: 0.3846  
Epoch 3/20  
 - 0s - loss: 0.4622 - acc: 0.5111 - val\_loss: 0.4505 - val\_acc: 0.5897  
Epoch 4/20  
 - 0s - loss: 0.4332 - acc: 0.6222 - val\_loss: 0.4204 - val\_acc: 0.6410  
Epoch 5/20  
 - 0s - loss: 0.4011 - acc: 0.7000 - val\_loss: 0.3907 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3721 - acc: 0.7278 - val\_loss: 0.3634 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3487 - acc: 0.7389 - val\_loss: 0.3397 - val\_acc: 0.7436  
Epoch 8/20  
 - 0s - loss: 0.3278 - acc: 0.7444 - val\_loss: 0.3189 - val\_acc: 0.7564  
Epoch 9/20  
 - 0s - loss: 0.3108 - acc: 0.7556 - val\_loss: 0.3014 - val\_acc: 0.7692  
Epoch 10/20  
 - 0s - loss: 0.3058 - acc: 0.7667 - val\_loss: 0.2873 - val\_acc: 0.7692  
Epoch 11/20  
 - 0s - loss: 0.2846 - acc: 0.7667 - val\_loss: 0.2756 - val\_acc: 0.7692  
Epoch 12/20  
 - 0s - loss: 0.2756 - acc: 0.7778 - val\_loss: 0.2651 - val\_acc: 0.7692  
Epoch 13/20  
 - 0s - loss: 0.2670 - acc: 0.7722 - val\_loss: 0.2545 - val\_acc: 0.7821  
Epoch 14/20  
 - 0s - loss: 0.2564 - acc: 0.7722 - val\_loss: 0.2397 - val\_acc: 0.7692  
Epoch 15/20  
 - 0s - loss: 0.2398 - acc: 0.8000 - val\_loss: 0.2290 - val\_acc: 0.8205  
Epoch 16/20  
 - 0s - loss: 0.2425 - acc: 0.8000 - val\_loss: 0.2212 - val\_acc: 0.7821  
Epoch 17/20  
 - 0s - loss: 0.2276 - acc: 0.8222 - val\_loss: 0.2146 - val\_acc: 0.8077  
Epoch 18/20  
 - 0s - loss: 0.2252 - acc: 0.8611 - val\_loss: 0.2083 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2121 - acc: 0.8667 - val\_loss: 0.2016 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2135 - acc: 0.8722 - val\_loss: 0.1963 - val\_acc: 0.8718  
86/86 [==============================] - 0s 92us/step  
acc: 86.05%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4958 - acc: 0.3000 - val\_loss: 0.4936 - val\_acc: 0.1282  
Epoch 2/20  
 - 0s - loss: 0.4873 - acc: 0.3722 - val\_loss: 0.4767 - val\_acc: 0.4615  
Epoch 3/20  
 - 0s - loss: 0.4625 - acc: 0.5556 - val\_loss: 0.4469 - val\_acc: 0.6026  
Epoch 4/20  
 - 0s - loss: 0.4296 - acc: 0.6111 - val\_loss: 0.4137 - val\_acc: 0.7051  
Epoch 5/20  
 - 0s - loss: 0.3973 - acc: 0.7056 - val\_loss: 0.3821 - val\_acc: 0.7179  
Epoch 6/20  
 - 0s - loss: 0.3695 - acc: 0.7167 - val\_loss: 0.3534 - val\_acc: 0.7179  
Epoch 7/20  
 - 0s - loss: 0.3415 - acc: 0.7167 - val\_loss: 0.3299 - val\_acc: 0.7308  
Epoch 8/20  
 - 0s - loss: 0.3191 - acc: 0.7389 - val\_loss: 0.3118 - val\_acc: 0.7436  
Epoch 9/20  
 - 0s - loss: 0.3065 - acc: 0.7444 - val\_loss: 0.2976 - val\_acc: 0.7692  
Epoch 10/20  
 - 0s - loss: 0.3098 - acc: 0.7500 - val\_loss: 0.2865 - val\_acc: 0.7692  
Epoch 11/20  
 - 0s - loss: 0.2867 - acc: 0.7500 - val\_loss: 0.2768 - val\_acc: 0.7692  
Epoch 12/20  
 - 0s - loss: 0.2801 - acc: 0.7667 - val\_loss: 0.2678 - val\_acc: 0.7692  
Epoch 13/20  
 - 0s - loss: 0.2646 - acc: 0.7444 - val\_loss: 0.2589 - val\_acc: 0.7821  
Epoch 14/20  
 - 0s - loss: 0.2607 - acc: 0.7611 - val\_loss: 0.2487 - val\_acc: 0.7949  
Epoch 15/20  
 - 0s - loss: 0.2461 - acc: 0.7722 - val\_loss: 0.2328 - val\_acc: 0.7949  
Epoch 16/20  
 - 0s - loss: 0.2480 - acc: 0.7833 - val\_loss: 0.2226 - val\_acc: 0.7949  
Epoch 17/20  
 - 0s - loss: 0.2270 - acc: 0.8167 - val\_loss: 0.2145 - val\_acc: 0.8333  
Epoch 18/20  
 - 0s - loss: 0.2212 - acc: 0.8778 - val\_loss: 0.2075 - val\_acc: 0.8590  
Epoch 19/20  
 - 0s - loss: 0.2119 - acc: 0.8611 - val\_loss: 0.2009 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2159 - acc: 0.8722 - val\_loss: 0.1946 - val\_acc: 0.8718  
86/86 [==============================] - 0s 118us/step  
acc: 86.05%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4955 - acc: 0.3056 - val\_loss: 0.4926 - val\_acc: 0.2179  
Epoch 2/20  
 - 0s - loss: 0.4809 - acc: 0.4278 - val\_loss: 0.4687 - val\_acc: 0.4487  
Epoch 3/20  
 - 0s - loss: 0.4531 - acc: 0.5111 - val\_loss: 0.4326 - val\_acc: 0.6154  
Epoch 4/20  
 - 0s - loss: 0.4083 - acc: 0.6556 - val\_loss: 0.3924 - val\_acc: 0.6538  
Epoch 5/20  
 - 0s - loss: 0.3715 - acc: 0.6722 - val\_loss: 0.3564 - val\_acc: 0.6667  
Epoch 6/20  
 - 0s - loss: 0.3335 - acc: 0.7278 - val\_loss: 0.3258 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3203 - acc: 0.7333 - val\_loss: 0.3015 - val\_acc: 0.7564  
Epoch 8/20  
 - 0s - loss: 0.2994 - acc: 0.7611 - val\_loss: 0.2826 - val\_acc: 0.7821  
Epoch 9/20  
 - 0s - loss: 0.2849 - acc: 0.8056 - val\_loss: 0.2672 - val\_acc: 0.8205  
Epoch 10/20  
 - 0s - loss: 0.2946 - acc: 0.8389 - val\_loss: 0.2554 - val\_acc: 0.8590  
Epoch 11/20  
 - 0s - loss: 0.2550 - acc: 0.8222 - val\_loss: 0.2458 - val\_acc: 0.8718  
Epoch 12/20  
 - 0s - loss: 0.2515 - acc: 0.8667 - val\_loss: 0.2364 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2388 - acc: 0.8667 - val\_loss: 0.2275 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2296 - acc: 0.8722 - val\_loss: 0.2193 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2188 - acc: 0.8889 - val\_loss: 0.2116 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2331 - acc: 0.8889 - val\_loss: 0.2052 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2098 - acc: 0.8889 - val\_loss: 0.1995 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2088 - acc: 0.8889 - val\_loss: 0.1945 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2043 - acc: 0.8889 - val\_loss: 0.1884 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2109 - acc: 0.8889 - val\_loss: 0.1837 - val\_acc: 0.8718  
86/86 [==============================] - 0s 96us/step  
acc: 86.05%  
gen nevals avg std min max   
0 10 [0.30535051 0.79069768] [0.07176556 0.20930233] [0.20675626 0.1627907 ] [0.48451514 0.86046512]  
(344, 36)  
(344, 19)  
19  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4948 - acc: 0.2222 - val\_loss: 0.4918 - val\_acc: 0.2179  
Epoch 2/20  
 - 0s - loss: 0.4788 - acc: 0.4111 - val\_loss: 0.4661 - val\_acc: 0.4872  
Epoch 3/20  
 - 0s - loss: 0.4466 - acc: 0.5556 - val\_loss: 0.4316 - val\_acc: 0.6795  
Epoch 4/20  
 - 0s - loss: 0.4103 - acc: 0.6611 - val\_loss: 0.3970 - val\_acc: 0.7051  
Epoch 5/20  
 - 0s - loss: 0.3767 - acc: 0.6778 - val\_loss: 0.3670 - val\_acc: 0.7179  
Epoch 6/20  
 - 0s - loss: 0.3511 - acc: 0.7000 - val\_loss: 0.3420 - val\_acc: 0.7436  
Epoch 7/20  
 - 0s - loss: 0.3347 - acc: 0.7278 - val\_loss: 0.3222 - val\_acc: 0.7692  
Epoch 8/20  
 - 0s - loss: 0.3201 - acc: 0.7222 - val\_loss: 0.3083 - val\_acc: 0.7692  
Epoch 9/20  
 - 0s - loss: 0.3068 - acc: 0.7333 - val\_loss: 0.2976 - val\_acc: 0.7692  
Epoch 10/20  
 - 0s - loss: 0.3118 - acc: 0.7333 - val\_loss: 0.2887 - val\_acc: 0.7821  
Epoch 11/20  
 - 0s - loss: 0.2877 - acc: 0.7500 - val\_loss: 0.2804 - val\_acc: 0.7692  
Epoch 12/20  
 - 0s - loss: 0.2836 - acc: 0.7667 - val\_loss: 0.2713 - val\_acc: 0.7821  
Epoch 13/20  
 - 0s - loss: 0.2752 - acc: 0.7556 - val\_loss: 0.2624 - val\_acc: 0.7692  
Epoch 14/20  
 - 0s - loss: 0.2650 - acc: 0.7778 - val\_loss: 0.2500 - val\_acc: 0.8077  
Epoch 15/20  
 - 0s - loss: 0.2484 - acc: 0.8111 - val\_loss: 0.2352 - val\_acc: 0.8333  
Epoch 16/20  
 - 0s - loss: 0.2501 - acc: 0.8056 - val\_loss: 0.2240 - val\_acc: 0.8590  
Epoch 17/20  
 - 0s - loss: 0.2293 - acc: 0.8333 - val\_loss: 0.2140 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2220 - acc: 0.8611 - val\_loss: 0.2068 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2095 - acc: 0.8778 - val\_loss: 0.1994 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2195 - acc: 0.8889 - val\_loss: 0.1946 - val\_acc: 0.8718  
86/86 [==============================] - 0s 119us/step  
acc: 86.05%  
(344, 36)  
(344, 21)  
21  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4939 - acc: 0.2889 - val\_loss: 0.4903 - val\_acc: 0.2692  
Epoch 2/20  
 - 0s - loss: 0.4751 - acc: 0.4500 - val\_loss: 0.4632 - val\_acc: 0.5256  
Epoch 3/20  
 - 0s - loss: 0.4420 - acc: 0.5722 - val\_loss: 0.4264 - val\_acc: 0.6026  
Epoch 4/20  
 - 0s - loss: 0.4005 - acc: 0.6333 - val\_loss: 0.3897 - val\_acc: 0.6923  
Epoch 5/20  
 - 0s - loss: 0.3703 - acc: 0.6667 - val\_loss: 0.3598 - val\_acc: 0.7179  
Epoch 6/20  
 - 0s - loss: 0.3449 - acc: 0.6944 - val\_loss: 0.3365 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3334 - acc: 0.7056 - val\_loss: 0.3197 - val\_acc: 0.7564  
Epoch 8/20  
 - 0s - loss: 0.3085 - acc: 0.7278 - val\_loss: 0.3059 - val\_acc: 0.7692  
Epoch 9/20  
 - 0s - loss: 0.3127 - acc: 0.7167 - val\_loss: 0.2942 - val\_acc: 0.7821  
Epoch 10/20  
 - 0s - loss: 0.3139 - acc: 0.7444 - val\_loss: 0.2843 - val\_acc: 0.7821  
Epoch 11/20  
 - 0s - loss: 0.2884 - acc: 0.7389 - val\_loss: 0.2755 - val\_acc: 0.7949  
Epoch 12/20  
 - 0s - loss: 0.2846 - acc: 0.7722 - val\_loss: 0.2668 - val\_acc: 0.7821  
Epoch 13/20  
 - 0s - loss: 0.2772 - acc: 0.7500 - val\_loss: 0.2588 - val\_acc: 0.7821  
Epoch 14/20  
 - 0s - loss: 0.2658 - acc: 0.7556 - val\_loss: 0.2503 - val\_acc: 0.7821  
Epoch 15/20  
 - 0s - loss: 0.2561 - acc: 0.8056 - val\_loss: 0.2416 - val\_acc: 0.7692  
Epoch 16/20  
 - 0s - loss: 0.2576 - acc: 0.7778 - val\_loss: 0.2286 - val\_acc: 0.7949  
Epoch 17/20  
 - 0s - loss: 0.2361 - acc: 0.8111 - val\_loss: 0.2213 - val\_acc: 0.8205  
Epoch 18/20  
 - 0s - loss: 0.2337 - acc: 0.8611 - val\_loss: 0.2142 - val\_acc: 0.8846  
Epoch 19/20  
 - 0s - loss: 0.2266 - acc: 0.8389 - val\_loss: 0.2061 - val\_acc: 0.8846  
Epoch 20/20  
 - 0s - loss: 0.2225 - acc: 0.8833 - val\_loss: 0.1988 - val\_acc: 0.8718  
86/86 [==============================] - 0s 108us/step  
acc: 86.05%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4952 - acc: 0.3111 - val\_loss: 0.4916 - val\_acc: 0.1667  
Epoch 2/20  
 - 0s - loss: 0.4809 - acc: 0.4000 - val\_loss: 0.4700 - val\_acc: 0.3846  
Epoch 3/20  
 - 0s - loss: 0.4566 - acc: 0.4611 - val\_loss: 0.4331 - val\_acc: 0.6026  
Epoch 4/20  
 - 0s - loss: 0.4098 - acc: 0.6111 - val\_loss: 0.3899 - val\_acc: 0.6410  
Epoch 5/20  
 - 0s - loss: 0.3713 - acc: 0.6611 - val\_loss: 0.3506 - val\_acc: 0.6538  
Epoch 6/20  
 - 0s - loss: 0.3337 - acc: 0.7278 - val\_loss: 0.3200 - val\_acc: 0.7051  
Epoch 7/20  
 - 0s - loss: 0.3206 - acc: 0.7333 - val\_loss: 0.2968 - val\_acc: 0.7436  
Epoch 8/20  
 - 0s - loss: 0.3022 - acc: 0.7611 - val\_loss: 0.2796 - val\_acc: 0.7564  
Epoch 9/20  
 - 0s - loss: 0.2904 - acc: 0.7944 - val\_loss: 0.2660 - val\_acc: 0.8077  
Epoch 10/20  
 - 0s - loss: 0.3000 - acc: 0.8000 - val\_loss: 0.2548 - val\_acc: 0.8718  
Epoch 11/20  
 - 0s - loss: 0.2615 - acc: 0.8611 - val\_loss: 0.2453 - val\_acc: 0.8718  
Epoch 12/20  
 - 0s - loss: 0.2571 - acc: 0.8833 - val\_loss: 0.2364 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2413 - acc: 0.8778 - val\_loss: 0.2276 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2386 - acc: 0.8833 - val\_loss: 0.2196 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2240 - acc: 0.8889 - val\_loss: 0.2118 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2424 - acc: 0.8889 - val\_loss: 0.2052 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2150 - acc: 0.8889 - val\_loss: 0.1989 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2136 - acc: 0.8889 - val\_loss: 0.1932 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.1992 - acc: 0.8889 - val\_loss: 0.1881 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2177 - acc: 0.8889 - val\_loss: 0.1838 - val\_acc: 0.8718  
86/86 [==============================] - 0s 129us/step  
acc: 86.05%  
(344, 36)  
(344, 15)  
15  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4944 - acc: 0.3000 - val\_loss: 0.4903 - val\_acc: 0.1795  
Epoch 2/20  
 - 0s - loss: 0.4774 - acc: 0.4722 - val\_loss: 0.4640 - val\_acc: 0.5641  
Epoch 3/20  
 - 0s - loss: 0.4453 - acc: 0.6056 - val\_loss: 0.4299 - val\_acc: 0.6282  
Epoch 4/20  
 - 0s - loss: 0.4082 - acc: 0.6722 - val\_loss: 0.3955 - val\_acc: 0.7179  
Epoch 5/20  
 - 0s - loss: 0.3752 - acc: 0.6889 - val\_loss: 0.3653 - val\_acc: 0.7436  
Epoch 6/20  
 - 0s - loss: 0.3493 - acc: 0.7167 - val\_loss: 0.3397 - val\_acc: 0.7436  
Epoch 7/20  
 - 0s - loss: 0.3296 - acc: 0.7222 - val\_loss: 0.3193 - val\_acc: 0.7564  
Epoch 8/20  
 - 0s - loss: 0.3183 - acc: 0.7389 - val\_loss: 0.3051 - val\_acc: 0.7564  
Epoch 9/20  
 - 0s - loss: 0.3079 - acc: 0.7389 - val\_loss: 0.2946 - val\_acc: 0.7692  
Epoch 10/20  
 - 0s - loss: 0.3176 - acc: 0.7500 - val\_loss: 0.2860 - val\_acc: 0.7692  
Epoch 11/20  
 - 0s - loss: 0.2872 - acc: 0.7333 - val\_loss: 0.2782 - val\_acc: 0.7821  
Epoch 12/20  
 - 0s - loss: 0.2838 - acc: 0.7556 - val\_loss: 0.2706 - val\_acc: 0.7821  
Epoch 13/20  
 - 0s - loss: 0.2735 - acc: 0.7444 - val\_loss: 0.2625 - val\_acc: 0.7821  
Epoch 14/20  
 - 0s - loss: 0.2695 - acc: 0.7500 - val\_loss: 0.2528 - val\_acc: 0.7821  
Epoch 15/20  
 - 0s - loss: 0.2519 - acc: 0.7944 - val\_loss: 0.2369 - val\_acc: 0.7949  
Epoch 16/20  
 - 0s - loss: 0.2573 - acc: 0.7833 - val\_loss: 0.2268 - val\_acc: 0.7692  
Epoch 17/20  
 - 0s - loss: 0.2333 - acc: 0.8167 - val\_loss: 0.2189 - val\_acc: 0.8462  
Epoch 18/20  
 - 0s - loss: 0.2307 - acc: 0.8611 - val\_loss: 0.2123 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2149 - acc: 0.8611 - val\_loss: 0.2046 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2202 - acc: 0.8722 - val\_loss: 0.1994 - val\_acc: 0.8718  
86/86 [==============================] - 0s 108us/step  
acc: 86.05%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4940 - acc: 0.3000 - val\_loss: 0.4894 - val\_acc: 0.2564  
Epoch 2/20  
 - 0s - loss: 0.4759 - acc: 0.4833 - val\_loss: 0.4638 - val\_acc: 0.5513  
Epoch 3/20  
 - 0s - loss: 0.4434 - acc: 0.6056 - val\_loss: 0.4305 - val\_acc: 0.6410  
Epoch 4/20  
 - 0s - loss: 0.4047 - acc: 0.6778 - val\_loss: 0.3959 - val\_acc: 0.6923  
Epoch 5/20  
 - 0s - loss: 0.3733 - acc: 0.7111 - val\_loss: 0.3645 - val\_acc: 0.7308  
Epoch 6/20  
 - 0s - loss: 0.3451 - acc: 0.7278 - val\_loss: 0.3391 - val\_acc: 0.7692  
Epoch 7/20  
 - 0s - loss: 0.3248 - acc: 0.7389 - val\_loss: 0.3197 - val\_acc: 0.7821  
Epoch 8/20  
 - 0s - loss: 0.3039 - acc: 0.7444 - val\_loss: 0.3049 - val\_acc: 0.7821  
Epoch 9/20  
 - 0s - loss: 0.2998 - acc: 0.7444 - val\_loss: 0.2926 - val\_acc: 0.7821  
Epoch 10/20  
 - 0s - loss: 0.3062 - acc: 0.7611 - val\_loss: 0.2824 - val\_acc: 0.7821  
Epoch 11/20  
 - 0s - loss: 0.2831 - acc: 0.7556 - val\_loss: 0.2738 - val\_acc: 0.7821  
Epoch 12/20  
 - 0s - loss: 0.2799 - acc: 0.7833 - val\_loss: 0.2658 - val\_acc: 0.7821  
Epoch 13/20  
 - 0s - loss: 0.2673 - acc: 0.7500 - val\_loss: 0.2586 - val\_acc: 0.7692  
Epoch 14/20  
 - 0s - loss: 0.2622 - acc: 0.7611 - val\_loss: 0.2502 - val\_acc: 0.7692  
Epoch 15/20  
 - 0s - loss: 0.2490 - acc: 0.7944 - val\_loss: 0.2369 - val\_acc: 0.7692  
Epoch 16/20  
 - 0s - loss: 0.2537 - acc: 0.7889 - val\_loss: 0.2271 - val\_acc: 0.8077  
Epoch 17/20  
 - 0s - loss: 0.2312 - acc: 0.8167 - val\_loss: 0.2194 - val\_acc: 0.7949  
Epoch 18/20  
 - 0s - loss: 0.2238 - acc: 0.8833 - val\_loss: 0.2127 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2151 - acc: 0.8667 - val\_loss: 0.2059 - val\_acc: 0.8846  
Epoch 20/20  
 - 0s - loss: 0.2243 - acc: 0.8833 - val\_loss: 0.1998 - val\_acc: 0.8718  
86/86 [==============================] - 0s 103us/step  
acc: 86.05%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4920 - acc: 0.3667 - val\_loss: 0.4874 - val\_acc: 0.3205  
Epoch 2/20  
 - 0s - loss: 0.4739 - acc: 0.4500 - val\_loss: 0.4612 - val\_acc: 0.5385  
Epoch 3/20  
 - 0s - loss: 0.4425 - acc: 0.5833 - val\_loss: 0.4271 - val\_acc: 0.6282  
Epoch 4/20  
 - 0s - loss: 0.4012 - acc: 0.6556 - val\_loss: 0.3925 - val\_acc: 0.6667  
Epoch 5/20  
 - 0s - loss: 0.3710 - acc: 0.6667 - val\_loss: 0.3628 - val\_acc: 0.7308  
Epoch 6/20  
 - 0s - loss: 0.3441 - acc: 0.6944 - val\_loss: 0.3395 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3312 - acc: 0.7000 - val\_loss: 0.3227 - val\_acc: 0.7436  
Epoch 8/20  
 - 0s - loss: 0.3111 - acc: 0.7056 - val\_loss: 0.3096 - val\_acc: 0.7821  
Epoch 9/20  
 - 0s - loss: 0.3082 - acc: 0.7278 - val\_loss: 0.2989 - val\_acc: 0.7949  
Epoch 10/20  
 - 0s - loss: 0.3157 - acc: 0.7278 - val\_loss: 0.2896 - val\_acc: 0.7949  
Epoch 11/20  
 - 0s - loss: 0.2915 - acc: 0.7278 - val\_loss: 0.2816 - val\_acc: 0.7949  
Epoch 12/20  
 - 0s - loss: 0.2856 - acc: 0.7611 - val\_loss: 0.2738 - val\_acc: 0.7821  
Epoch 13/20  
 - 0s - loss: 0.2740 - acc: 0.7333 - val\_loss: 0.2664 - val\_acc: 0.7821  
Epoch 14/20  
 - 0s - loss: 0.2685 - acc: 0.7556 - val\_loss: 0.2577 - val\_acc: 0.7821  
Epoch 15/20  
 - 0s - loss: 0.2570 - acc: 0.8000 - val\_loss: 0.2473 - val\_acc: 0.7821  
Epoch 16/20  
 - 0s - loss: 0.2580 - acc: 0.7889 - val\_loss: 0.2334 - val\_acc: 0.8205  
Epoch 17/20  
 - 0s - loss: 0.2353 - acc: 0.8278 - val\_loss: 0.2246 - val\_acc: 0.8590  
Epoch 18/20  
 - 0s - loss: 0.2286 - acc: 0.8500 - val\_loss: 0.2170 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2182 - acc: 0.8500 - val\_loss: 0.2096 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2229 - acc: 0.8778 - val\_loss: 0.2024 - val\_acc: 0.8718  
86/86 [==============================] - 0s 120us/step  
acc: 86.05%  
(344, 36)  
(344, 17)  
17  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4957 - acc: 0.2722 - val\_loss: 0.4934 - val\_acc: 0.1282  
Epoch 2/20  
 - 0s - loss: 0.4857 - acc: 0.3889 - val\_loss: 0.4729 - val\_acc: 0.5000  
Epoch 3/20  
 - 0s - loss: 0.4588 - acc: 0.5611 - val\_loss: 0.4425 - val\_acc: 0.5385  
Epoch 4/20  
 - 0s - loss: 0.4261 - acc: 0.6278 - val\_loss: 0.4090 - val\_acc: 0.6538  
Epoch 5/20  
 - 0s - loss: 0.3949 - acc: 0.6722 - val\_loss: 0.3778 - val\_acc: 0.6923  
Epoch 6/20  
 - 0s - loss: 0.3653 - acc: 0.6944 - val\_loss: 0.3499 - val\_acc: 0.7564  
Epoch 7/20  
 - 0s - loss: 0.3392 - acc: 0.7056 - val\_loss: 0.3280 - val\_acc: 0.7692  
Epoch 8/20  
 - 0s - loss: 0.3224 - acc: 0.7222 - val\_loss: 0.3123 - val\_acc: 0.7692  
Epoch 9/20  
 - 0s - loss: 0.3087 - acc: 0.7167 - val\_loss: 0.3001 - val\_acc: 0.7821  
Epoch 10/20  
 - 0s - loss: 0.3146 - acc: 0.7333 - val\_loss: 0.2906 - val\_acc: 0.7821  
Epoch 11/20  
 - 0s - loss: 0.2971 - acc: 0.7333 - val\_loss: 0.2825 - val\_acc: 0.7692  
Epoch 12/20  
 - 0s - loss: 0.2869 - acc: 0.7611 - val\_loss: 0.2740 - val\_acc: 0.7821  
Epoch 13/20  
 - 0s - loss: 0.2715 - acc: 0.7389 - val\_loss: 0.2638 - val\_acc: 0.7821  
Epoch 14/20  
 - 0s - loss: 0.2675 - acc: 0.7500 - val\_loss: 0.2524 - val\_acc: 0.7821  
Epoch 15/20  
 - 0s - loss: 0.2564 - acc: 0.7833 - val\_loss: 0.2353 - val\_acc: 0.7949  
Epoch 16/20  
 - 0s - loss: 0.2555 - acc: 0.7944 - val\_loss: 0.2250 - val\_acc: 0.7949  
Epoch 17/20  
 - 0s - loss: 0.2296 - acc: 0.7944 - val\_loss: 0.2166 - val\_acc: 0.8462  
Epoch 18/20  
 - 0s - loss: 0.2235 - acc: 0.8500 - val\_loss: 0.2097 - val\_acc: 0.8590  
Epoch 19/20  
 - 0s - loss: 0.2141 - acc: 0.8278 - val\_loss: 0.2022 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2223 - acc: 0.8889 - val\_loss: 0.1958 - val\_acc: 0.8718  
86/86 [==============================] - 0s 125us/step  
acc: 86.05%  
1 7 [0.2652971 0.86046512] [4.48175786e-02 2.22044605e-16] [0.20675626 0.86046512] [0.3053235 0.86046512]  
(344, 36)  
(344, 21)  
21  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4948 - acc: 0.2722 - val\_loss: 0.4912 - val\_acc: 0.2436  
Epoch 2/20  
 - 0s - loss: 0.4823 - acc: 0.3722 - val\_loss: 0.4699 - val\_acc: 0.5000  
Epoch 3/20  
 - 0s - loss: 0.4524 - acc: 0.5222 - val\_loss: 0.4387 - val\_acc: 0.6026  
Epoch 4/20  
 - 0s - loss: 0.4163 - acc: 0.6167 - val\_loss: 0.4061 - val\_acc: 0.6795  
Epoch 5/20  
 - 0s - loss: 0.3838 - acc: 0.6833 - val\_loss: 0.3763 - val\_acc: 0.6923  
Epoch 6/20  
 - 0s - loss: 0.3594 - acc: 0.7167 - val\_loss: 0.3499 - val\_acc: 0.7179  
Epoch 7/20  
 - 0s - loss: 0.3352 - acc: 0.7167 - val\_loss: 0.3293 - val\_acc: 0.7436  
Epoch 8/20  
 - 0s - loss: 0.3125 - acc: 0.7444 - val\_loss: 0.3114 - val\_acc: 0.7821  
Epoch 9/20  
 - 0s - loss: 0.3083 - acc: 0.7500 - val\_loss: 0.2975 - val\_acc: 0.7949  
Epoch 10/20  
 - 0s - loss: 0.3142 - acc: 0.7611 - val\_loss: 0.2883 - val\_acc: 0.7949  
Epoch 11/20  
 - 0s - loss: 0.2911 - acc: 0.7444 - val\_loss: 0.2759 - val\_acc: 0.7949  
Epoch 12/20  
 - 0s - loss: 0.2740 - acc: 0.7611 - val\_loss: 0.2632 - val\_acc: 0.7821  
Epoch 13/20  
 - 0s - loss: 0.2574 - acc: 0.7944 - val\_loss: 0.2524 - val\_acc: 0.8077  
Epoch 14/20  
 - 0s - loss: 0.2519 - acc: 0.8111 - val\_loss: 0.2420 - val\_acc: 0.8333  
Epoch 15/20  
 - 0s - loss: 0.2384 - acc: 0.8444 - val\_loss: 0.2320 - val\_acc: 0.8590  
Epoch 16/20  
 - 0s - loss: 0.2374 - acc: 0.8556 - val\_loss: 0.2233 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2290 - acc: 0.8556 - val\_loss: 0.2155 - val\_acc: 0.8846  
Epoch 18/20  
 - 0s - loss: 0.2282 - acc: 0.8667 - val\_loss: 0.2080 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2127 - acc: 0.8889 - val\_loss: 0.2013 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2161 - acc: 0.8833 - val\_loss: 0.1954 - val\_acc: 0.8718  
86/86 [==============================] - 0s 132us/step  
acc: 86.05%  
(344, 36)  
(344, 13)  
13  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4967 - acc: 0.2222 - val\_loss: 0.4921 - val\_acc: 0.1538  
Epoch 2/20  
 - 0s - loss: 0.4900 - acc: 0.1722 - val\_loss: 0.4851 - val\_acc: 0.1538  
Epoch 3/20  
 - 0s - loss: 0.4800 - acc: 0.1944 - val\_loss: 0.4755 - val\_acc: 0.1410  
Epoch 4/20  
 - 0s - loss: 0.4687 - acc: 0.2944 - val\_loss: 0.4649 - val\_acc: 0.1795  
Epoch 5/20  
 - 0s - loss: 0.4594 - acc: 0.2889 - val\_loss: 0.4535 - val\_acc: 0.2564  
Epoch 6/20  
 - 0s - loss: 0.4510 - acc: 0.3278 - val\_loss: 0.4394 - val\_acc: 0.3077  
Epoch 7/20  
 - 0s - loss: 0.4320 - acc: 0.4778 - val\_loss: 0.4176 - val\_acc: 0.3974  
Epoch 8/20  
 - 0s - loss: 0.4145 - acc: 0.5556 - val\_loss: 0.3881 - val\_acc: 0.7564  
Epoch 9/20  
 - 0s - loss: 0.3800 - acc: 0.7667 - val\_loss: 0.3553 - val\_acc: 0.8462  
Epoch 10/20  
 - 0s - loss: 0.3510 - acc: 0.8500 - val\_loss: 0.3223 - val\_acc: 0.8590  
Epoch 11/20  
 - 0s - loss: 0.3228 - acc: 0.8556 - val\_loss: 0.2903 - val\_acc: 0.8718  
Epoch 12/20  
 - 0s - loss: 0.2841 - acc: 0.8889 - val\_loss: 0.2604 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2620 - acc: 0.8778 - val\_loss: 0.2364 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2585 - acc: 0.8889 - val\_loss: 0.2178 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2344 - acc: 0.8889 - val\_loss: 0.2042 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2354 - acc: 0.8889 - val\_loss: 0.1937 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2340 - acc: 0.8889 - val\_loss: 0.1852 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2096 - acc: 0.8889 - val\_loss: 0.1794 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2112 - acc: 0.8889 - val\_loss: 0.1749 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2071 - acc: 0.8889 - val\_loss: 0.1711 - val\_acc: 0.8718  
86/86 [==============================] - 0s 140us/step  
acc: 86.05%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4952 - acc: 0.3167 - val\_loss: 0.4913 - val\_acc: 0.2051  
Epoch 2/20  
 - 0s - loss: 0.4812 - acc: 0.4333 - val\_loss: 0.4680 - val\_acc: 0.4615  
Epoch 3/20  
 - 0s - loss: 0.4544 - acc: 0.5111 - val\_loss: 0.4299 - val\_acc: 0.6026  
Epoch 4/20  
 - 0s - loss: 0.4047 - acc: 0.6389 - val\_loss: 0.3863 - val\_acc: 0.6410  
Epoch 5/20  
 - 0s - loss: 0.3684 - acc: 0.6611 - val\_loss: 0.3461 - val\_acc: 0.6667  
Epoch 6/20  
 - 0s - loss: 0.3294 - acc: 0.7444 - val\_loss: 0.3155 - val\_acc: 0.6923  
Epoch 7/20  
 - 0s - loss: 0.3180 - acc: 0.7333 - val\_loss: 0.2926 - val\_acc: 0.7692  
Epoch 8/20  
 - 0s - loss: 0.2950 - acc: 0.7500 - val\_loss: 0.2754 - val\_acc: 0.7692  
Epoch 9/20  
 - 0s - loss: 0.2927 - acc: 0.7944 - val\_loss: 0.2618 - val\_acc: 0.8333  
Epoch 10/20  
 - 0s - loss: 0.2975 - acc: 0.8389 - val\_loss: 0.2505 - val\_acc: 0.8462  
Epoch 11/20  
 - 0s - loss: 0.2609 - acc: 0.8500 - val\_loss: 0.2406 - val\_acc: 0.8590  
Epoch 12/20  
 - 0s - loss: 0.2528 - acc: 0.8778 - val\_loss: 0.2325 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2377 - acc: 0.8667 - val\_loss: 0.2240 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2374 - acc: 0.8778 - val\_loss: 0.2161 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2219 - acc: 0.8889 - val\_loss: 0.2089 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2397 - acc: 0.8889 - val\_loss: 0.2029 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2117 - acc: 0.8889 - val\_loss: 0.1974 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2190 - acc: 0.8889 - val\_loss: 0.1922 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2084 - acc: 0.8889 - val\_loss: 0.1860 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2143 - acc: 0.8889 - val\_loss: 0.1810 - val\_acc: 0.8718  
86/86 [==============================] - 0s 135us/step  
acc: 86.05%  
(344, 36)  
(344, 17)  
17  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4962 - acc: 0.2611 - val\_loss: 0.4924 - val\_acc: 0.1795  
Epoch 2/20  
 - 0s - loss: 0.4858 - acc: 0.3389 - val\_loss: 0.4750 - val\_acc: 0.4615  
Epoch 3/20  
 - 0s - loss: 0.4623 - acc: 0.4667 - val\_loss: 0.4437 - val\_acc: 0.5513  
Epoch 4/20  
 - 0s - loss: 0.4232 - acc: 0.6500 - val\_loss: 0.4048 - val\_acc: 0.6667  
Epoch 5/20  
 - 0s - loss: 0.3847 - acc: 0.6778 - val\_loss: 0.3679 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3472 - acc: 0.7222 - val\_loss: 0.3342 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3248 - acc: 0.7389 - val\_loss: 0.3059 - val\_acc: 0.7821  
Epoch 8/20  
 - 0s - loss: 0.3085 - acc: 0.7944 - val\_loss: 0.2840 - val\_acc: 0.7949  
Epoch 9/20  
 - 0s - loss: 0.2858 - acc: 0.8111 - val\_loss: 0.2674 - val\_acc: 0.8462  
Epoch 10/20  
 - 0s - loss: 0.2968 - acc: 0.8389 - val\_loss: 0.2544 - val\_acc: 0.8590  
Epoch 11/20  
 - 0s - loss: 0.2654 - acc: 0.8278 - val\_loss: 0.2442 - val\_acc: 0.8718  
Epoch 12/20  
 - 0s - loss: 0.2575 - acc: 0.8778 - val\_loss: 0.2356 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2354 - acc: 0.8667 - val\_loss: 0.2272 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2314 - acc: 0.8833 - val\_loss: 0.2183 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2201 - acc: 0.8889 - val\_loss: 0.2099 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2326 - acc: 0.8889 - val\_loss: 0.2035 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2108 - acc: 0.8889 - val\_loss: 0.1984 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2166 - acc: 0.8889 - val\_loss: 0.1934 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2131 - acc: 0.8889 - val\_loss: 0.1860 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2150 - acc: 0.8889 - val\_loss: 0.1807 - val\_acc: 0.8718  
86/86 [==============================] - 0s 137us/step  
acc: 86.05%  
(344, 36)  
(344, 17)  
17  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4951 - acc: 0.3111 - val\_loss: 0.4917 - val\_acc: 0.2051  
Epoch 2/20  
 - 0s - loss: 0.4810 - acc: 0.4000 - val\_loss: 0.4695 - val\_acc: 0.4487  
Epoch 3/20  
 - 0s - loss: 0.4506 - acc: 0.5444 - val\_loss: 0.4395 - val\_acc: 0.5641  
Epoch 4/20  
 - 0s - loss: 0.4178 - acc: 0.6056 - val\_loss: 0.4083 - val\_acc: 0.6667  
Epoch 5/20  
 - 0s - loss: 0.3875 - acc: 0.6833 - val\_loss: 0.3804 - val\_acc: 0.6795  
Epoch 6/20  
 - 0s - loss: 0.3642 - acc: 0.6889 - val\_loss: 0.3558 - val\_acc: 0.7179  
Epoch 7/20  
 - 0s - loss: 0.3382 - acc: 0.7111 - val\_loss: 0.3357 - val\_acc: 0.7436  
Epoch 8/20  
 - 0s - loss: 0.3200 - acc: 0.7333 - val\_loss: 0.3206 - val\_acc: 0.7436  
Epoch 9/20  
 - 0s - loss: 0.3100 - acc: 0.7333 - val\_loss: 0.3082 - val\_acc: 0.7436  
Epoch 10/20  
 - 0s - loss: 0.3152 - acc: 0.7556 - val\_loss: 0.2979 - val\_acc: 0.7564  
Epoch 11/20  
 - 0s - loss: 0.2966 - acc: 0.7444 - val\_loss: 0.2893 - val\_acc: 0.7692  
Epoch 12/20  
 - 0s - loss: 0.2891 - acc: 0.7611 - val\_loss: 0.2809 - val\_acc: 0.7692  
Epoch 13/20  
 - 0s - loss: 0.2760 - acc: 0.7389 - val\_loss: 0.2713 - val\_acc: 0.7564  
Epoch 14/20  
 - 0s - loss: 0.2733 - acc: 0.7667 - val\_loss: 0.2609 - val\_acc: 0.7821  
Epoch 15/20  
 - 0s - loss: 0.2676 - acc: 0.7944 - val\_loss: 0.2489 - val\_acc: 0.8077  
Epoch 16/20  
 - 0s - loss: 0.2564 - acc: 0.7889 - val\_loss: 0.2346 - val\_acc: 0.8462  
Epoch 17/20  
 - 0s - loss: 0.2354 - acc: 0.8167 - val\_loss: 0.2250 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2229 - acc: 0.8667 - val\_loss: 0.2169 - val\_acc: 0.8846  
Epoch 19/20  
 - 0s - loss: 0.2109 - acc: 0.8333 - val\_loss: 0.2090 - val\_acc: 0.8846  
Epoch 20/20  
 - 0s - loss: 0.2269 - acc: 0.8889 - val\_loss: 0.2021 - val\_acc: 0.8718  
86/86 [==============================] - 0s 148us/step  
acc: 86.05%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4950 - acc: 0.3333 - val\_loss: 0.4905 - val\_acc: 0.2179  
Epoch 2/20  
 - 0s - loss: 0.4801 - acc: 0.4389 - val\_loss: 0.4642 - val\_acc: 0.5385  
Epoch 3/20  
 - 0s - loss: 0.4494 - acc: 0.5944 - val\_loss: 0.4313 - val\_acc: 0.6538  
Epoch 4/20  
 - 0s - loss: 0.4153 - acc: 0.6389 - val\_loss: 0.3975 - val\_acc: 0.6667  
Epoch 5/20  
 - 0s - loss: 0.3846 - acc: 0.6833 - val\_loss: 0.3675 - val\_acc: 0.7179  
Epoch 6/20  
 - 0s - loss: 0.3578 - acc: 0.7000 - val\_loss: 0.3415 - val\_acc: 0.7949  
Epoch 7/20  
 - 0s - loss: 0.3347 - acc: 0.7111 - val\_loss: 0.3216 - val\_acc: 0.7821  
Epoch 8/20  
 - 0s - loss: 0.3177 - acc: 0.7278 - val\_loss: 0.3074 - val\_acc: 0.7821  
Epoch 9/20  
 - 0s - loss: 0.3057 - acc: 0.7389 - val\_loss: 0.2961 - val\_acc: 0.7821  
Epoch 10/20  
 - 0s - loss: 0.3111 - acc: 0.7389 - val\_loss: 0.2868 - val\_acc: 0.7821  
Epoch 11/20  
 - 0s - loss: 0.2918 - acc: 0.7444 - val\_loss: 0.2785 - val\_acc: 0.7692  
Epoch 12/20  
 - 0s - loss: 0.2845 - acc: 0.7611 - val\_loss: 0.2699 - val\_acc: 0.7692  
Epoch 13/20  
 - 0s - loss: 0.2715 - acc: 0.7722 - val\_loss: 0.2616 - val\_acc: 0.7692  
Epoch 14/20  
 - 0s - loss: 0.2649 - acc: 0.7556 - val\_loss: 0.2524 - val\_acc: 0.7692  
Epoch 15/20  
 - 0s - loss: 0.2549 - acc: 0.7722 - val\_loss: 0.2369 - val\_acc: 0.7692  
Epoch 16/20  
 - 0s - loss: 0.2520 - acc: 0.7778 - val\_loss: 0.2272 - val\_acc: 0.8077  
Epoch 17/20  
 - 0s - loss: 0.2295 - acc: 0.8278 - val\_loss: 0.2196 - val\_acc: 0.8462  
Epoch 18/20  
 - 0s - loss: 0.2257 - acc: 0.8778 - val\_loss: 0.2127 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2141 - acc: 0.8611 - val\_loss: 0.2053 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2209 - acc: 0.8889 - val\_loss: 0.1989 - val\_acc: 0.8718  
86/86 [==============================] - 0s 112us/step  
acc: 86.05%  
(344, 36)  
(344, 17)  
17  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4957 - acc: 0.2722 - val\_loss: 0.4934 - val\_acc: 0.1282  
Epoch 2/20  
 - 0s - loss: 0.4857 - acc: 0.3889 - val\_loss: 0.4729 - val\_acc: 0.5000  
Epoch 3/20  
 - 0s - loss: 0.4588 - acc: 0.5611 - val\_loss: 0.4425 - val\_acc: 0.5385  
Epoch 4/20  
 - 0s - loss: 0.4261 - acc: 0.6278 - val\_loss: 0.4090 - val\_acc: 0.6538  
Epoch 5/20  
 - 0s - loss: 0.3949 - acc: 0.6722 - val\_loss: 0.3778 - val\_acc: 0.6923  
Epoch 6/20  
 - 0s - loss: 0.3653 - acc: 0.6944 - val\_loss: 0.3499 - val\_acc: 0.7564  
Epoch 7/20  
 - 0s - loss: 0.3392 - acc: 0.7056 - val\_loss: 0.3280 - val\_acc: 0.7692  
Epoch 8/20  
 - 0s - loss: 0.3224 - acc: 0.7222 - val\_loss: 0.3123 - val\_acc: 0.7692  
Epoch 9/20  
 - 0s - loss: 0.3087 - acc: 0.7167 - val\_loss: 0.3001 - val\_acc: 0.7821  
Epoch 10/20  
 - 0s - loss: 0.3146 - acc: 0.7333 - val\_loss: 0.2906 - val\_acc: 0.7821  
Epoch 11/20  
 - 0s - loss: 0.2971 - acc: 0.7333 - val\_loss: 0.2825 - val\_acc: 0.7692  
Epoch 12/20  
 - 0s - loss: 0.2869 - acc: 0.7611 - val\_loss: 0.2740 - val\_acc: 0.7821  
Epoch 13/20  
 - 0s - loss: 0.2715 - acc: 0.7389 - val\_loss: 0.2638 - val\_acc: 0.7821  
Epoch 14/20  
 - 0s - loss: 0.2675 - acc: 0.7500 - val\_loss: 0.2524 - val\_acc: 0.7821  
Epoch 15/20  
 - 0s - loss: 0.2564 - acc: 0.7833 - val\_loss: 0.2353 - val\_acc: 0.7949  
Epoch 16/20  
 - 0s - loss: 0.2555 - acc: 0.7944 - val\_loss: 0.2250 - val\_acc: 0.7949  
Epoch 17/20  
 - 0s - loss: 0.2296 - acc: 0.7944 - val\_loss: 0.2166 - val\_acc: 0.8462  
Epoch 18/20  
 - 0s - loss: 0.2235 - acc: 0.8500 - val\_loss: 0.2097 - val\_acc: 0.8590  
Epoch 19/20  
 - 0s - loss: 0.2141 - acc: 0.8278 - val\_loss: 0.2022 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2223 - acc: 0.8889 - val\_loss: 0.1958 - val\_acc: 0.8718  
86/86 [==============================] - 0s 126us/step  
acc: 86.05%  
(344, 36)  
(344, 15)  
15  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 1s - loss: 0.4958 - acc: 0.2556 - val\_loss: 0.4938 - val\_acc: 0.1282  
Epoch 2/20  
 - 0s - loss: 0.4879 - acc: 0.3111 - val\_loss: 0.4814 - val\_acc: 0.2821  
Epoch 3/20  
 - 0s - loss: 0.4696 - acc: 0.4556 - val\_loss: 0.4548 - val\_acc: 0.5256  
Epoch 4/20  
 - 0s - loss: 0.4351 - acc: 0.5556 - val\_loss: 0.4202 - val\_acc: 0.6154  
Epoch 5/20  
 - 0s - loss: 0.4018 - acc: 0.6944 - val\_loss: 0.3823 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3649 - acc: 0.7389 - val\_loss: 0.3438 - val\_acc: 0.7949  
Epoch 7/20  
 - 0s - loss: 0.3306 - acc: 0.7722 - val\_loss: 0.3090 - val\_acc: 0.8077  
Epoch 8/20  
 - 0s - loss: 0.3088 - acc: 0.7556 - val\_loss: 0.2831 - val\_acc: 0.7949  
Epoch 9/20  
 - 0s - loss: 0.2895 - acc: 0.7944 - val\_loss: 0.2635 - val\_acc: 0.8333  
Epoch 10/20  
 - 0s - loss: 0.2991 - acc: 0.8222 - val\_loss: 0.2489 - val\_acc: 0.8077  
Epoch 11/20  
 - 0s - loss: 0.2663 - acc: 0.8278 - val\_loss: 0.2381 - val\_acc: 0.8718  
Epoch 12/20  
 - 0s - loss: 0.2643 - acc: 0.8667 - val\_loss: 0.2289 - val\_acc: 0.8846  
Epoch 13/20  
 - 0s - loss: 0.2451 - acc: 0.8667 - val\_loss: 0.2208 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2534 - acc: 0.8778 - val\_loss: 0.2138 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2449 - acc: 0.8778 - val\_loss: 0.2085 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2451 - acc: 0.8889 - val\_loss: 0.2065 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2300 - acc: 0.8833 - val\_loss: 0.2074 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2225 - acc: 0.8889 - val\_loss: 0.2028 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2176 - acc: 0.8889 - val\_loss: 0.1923 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2115 - acc: 0.8889 - val\_loss: 0.1861 - val\_acc: 0.8718  
86/86 [==============================] - 0s 137us/step  
acc: 81.40%  
(344, 36)  
(344, 17)  
17  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4957 - acc: 0.3111 - val\_loss: 0.4925 - val\_acc: 0.1795  
Epoch 2/20  
 - 0s - loss: 0.4846 - acc: 0.3722 - val\_loss: 0.4747 - val\_acc: 0.4359  
Epoch 3/20  
 - 0s - loss: 0.4612 - acc: 0.4722 - val\_loss: 0.4401 - val\_acc: 0.6026  
Epoch 4/20  
 - 0s - loss: 0.4162 - acc: 0.6278 - val\_loss: 0.3980 - val\_acc: 0.6410  
Epoch 5/20  
 - 0s - loss: 0.3795 - acc: 0.6500 - val\_loss: 0.3555 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3357 - acc: 0.7333 - val\_loss: 0.3200 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3204 - acc: 0.7389 - val\_loss: 0.2942 - val\_acc: 0.7436  
Epoch 8/20  
 - 0s - loss: 0.2959 - acc: 0.7389 - val\_loss: 0.2753 - val\_acc: 0.8077  
Epoch 9/20  
 - 0s - loss: 0.2911 - acc: 0.7889 - val\_loss: 0.2603 - val\_acc: 0.8462  
Epoch 10/20  
 - 0s - loss: 0.2968 - acc: 0.8278 - val\_loss: 0.2482 - val\_acc: 0.8590  
Epoch 11/20  
 - 0s - loss: 0.2643 - acc: 0.8500 - val\_loss: 0.2381 - val\_acc: 0.8590  
Epoch 12/20  
 - 0s - loss: 0.2566 - acc: 0.8722 - val\_loss: 0.2289 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2384 - acc: 0.8722 - val\_loss: 0.2208 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2461 - acc: 0.8778 - val\_loss: 0.2133 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2377 - acc: 0.8889 - val\_loss: 0.2065 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2432 - acc: 0.8889 - val\_loss: 0.2014 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2381 - acc: 0.8889 - val\_loss: 0.1986 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2287 - acc: 0.8889 - val\_loss: 0.1971 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2245 - acc: 0.8889 - val\_loss: 0.1902 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2086 - acc: 0.8889 - val\_loss: 0.1849 - val\_acc: 0.8718  
86/86 [==============================] - 0s 121us/step  
acc: 86.05%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4953 - acc: 0.2667 - val\_loss: 0.4908 - val\_acc: 0.1410  
Epoch 2/20  
 - 0s - loss: 0.4819 - acc: 0.2944 - val\_loss: 0.4760 - val\_acc: 0.2308  
Epoch 3/20  
 - 0s - loss: 0.4631 - acc: 0.4000 - val\_loss: 0.4466 - val\_acc: 0.4872  
Epoch 4/20  
 - 0s - loss: 0.4219 - acc: 0.5778 - val\_loss: 0.4073 - val\_acc: 0.6154  
Epoch 5/20  
 - 0s - loss: 0.3804 - acc: 0.6944 - val\_loss: 0.3657 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3371 - acc: 0.7444 - val\_loss: 0.3295 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3184 - acc: 0.7556 - val\_loss: 0.3025 - val\_acc: 0.7308  
Epoch 8/20  
 - 0s - loss: 0.2934 - acc: 0.7833 - val\_loss: 0.2826 - val\_acc: 0.7821  
Epoch 9/20  
 - 0s - loss: 0.2909 - acc: 0.8222 - val\_loss: 0.2671 - val\_acc: 0.7564  
Epoch 10/20  
 - 0s - loss: 0.2974 - acc: 0.8222 - val\_loss: 0.2545 - val\_acc: 0.8333  
Epoch 11/20  
 - 0s - loss: 0.2642 - acc: 0.8500 - val\_loss: 0.2441 - val\_acc: 0.8590  
Epoch 12/20  
 - 0s - loss: 0.2584 - acc: 0.8833 - val\_loss: 0.2347 - val\_acc: 0.8590  
Epoch 13/20  
 - 0s - loss: 0.2368 - acc: 0.8833 - val\_loss: 0.2261 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2433 - acc: 0.8889 - val\_loss: 0.2186 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2244 - acc: 0.8889 - val\_loss: 0.2118 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2342 - acc: 0.8889 - val\_loss: 0.2056 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2131 - acc: 0.8889 - val\_loss: 0.1997 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2183 - acc: 0.8889 - val\_loss: 0.1941 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2120 - acc: 0.8889 - val\_loss: 0.1876 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2176 - acc: 0.8889 - val\_loss: 0.1824 - val\_acc: 0.8718  
86/86 [==============================] - 0s 128us/step  
acc: 80.23%  
(344, 36)  
(344, 20)  
20  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4950 - acc: 0.2833 - val\_loss: 0.4886 - val\_acc: 0.1410  
Epoch 2/20  
 - 0s - loss: 0.4840 - acc: 0.2556 - val\_loss: 0.4777 - val\_acc: 0.1282  
Epoch 3/20  
 - 0s - loss: 0.4732 - acc: 0.2556 - val\_loss: 0.4678 - val\_acc: 0.1410  
Epoch 4/20  
 - 0s - loss: 0.4588 - acc: 0.2556 - val\_loss: 0.4577 - val\_acc: 0.2436  
Epoch 5/20  
 - 0s - loss: 0.4458 - acc: 0.3611 - val\_loss: 0.4409 - val\_acc: 0.3590  
Epoch 6/20  
 - 0s - loss: 0.4234 - acc: 0.5333 - val\_loss: 0.4006 - val\_acc: 0.6538  
Epoch 7/20  
 - 0s - loss: 0.3768 - acc: 0.7333 - val\_loss: 0.3488 - val\_acc: 0.7949  
Epoch 8/20  
 - 0s - loss: 0.3282 - acc: 0.8333 - val\_loss: 0.3030 - val\_acc: 0.8462  
Epoch 9/20  
 - 0s - loss: 0.2925 - acc: 0.8556 - val\_loss: 0.2721 - val\_acc: 0.8718  
Epoch 10/20  
 - 0s - loss: 0.2945 - acc: 0.8556 - val\_loss: 0.2531 - val\_acc: 0.8718  
Epoch 11/20  
 - 0s - loss: 0.2638 - acc: 0.8611 - val\_loss: 0.2389 - val\_acc: 0.8718  
Epoch 12/20  
 - 0s - loss: 0.2543 - acc: 0.8944 - val\_loss: 0.2275 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2302 - acc: 0.8778 - val\_loss: 0.2181 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2360 - acc: 0.8833 - val\_loss: 0.2105 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2352 - acc: 0.8889 - val\_loss: 0.2046 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2421 - acc: 0.8889 - val\_loss: 0.2002 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2362 - acc: 0.8889 - val\_loss: 0.1971 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2201 - acc: 0.8889 - val\_loss: 0.1964 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2117 - acc: 0.8889 - val\_loss: 0.1921 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2203 - acc: 0.8889 - val\_loss: 0.1855 - val\_acc: 0.8718  
86/86 [==============================] - 0s 137us/step  
acc: 20.93%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4942 - acc: 0.2889 - val\_loss: 0.4911 - val\_acc: 0.1923  
Epoch 2/20  
 - 0s - loss: 0.4791 - acc: 0.3944 - val\_loss: 0.4640 - val\_acc: 0.5256  
Epoch 3/20  
 - 0s - loss: 0.4507 - acc: 0.5500 - val\_loss: 0.4321 - val\_acc: 0.6538  
Epoch 4/20  
 - 0s - loss: 0.4146 - acc: 0.6167 - val\_loss: 0.3983 - val\_acc: 0.6923  
Epoch 5/20  
 - 0s - loss: 0.3822 - acc: 0.6667 - val\_loss: 0.3690 - val\_acc: 0.7179  
Epoch 6/20  
 - 0s - loss: 0.3545 - acc: 0.6889 - val\_loss: 0.3419 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3388 - acc: 0.7000 - val\_loss: 0.3196 - val\_acc: 0.7564  
Epoch 8/20  
 - 0s - loss: 0.3187 - acc: 0.7111 - val\_loss: 0.2980 - val\_acc: 0.7821  
Epoch 9/20  
 - 0s - loss: 0.3001 - acc: 0.7333 - val\_loss: 0.2778 - val\_acc: 0.7949  
Epoch 10/20  
 - 0s - loss: 0.2964 - acc: 0.7444 - val\_loss: 0.2613 - val\_acc: 0.7821  
Epoch 11/20  
 - 0s - loss: 0.2670 - acc: 0.7500 - val\_loss: 0.2476 - val\_acc: 0.8205  
Epoch 12/20  
 - 0s - loss: 0.2596 - acc: 0.8556 - val\_loss: 0.2359 - val\_acc: 0.8462  
Epoch 13/20  
 - 0s - loss: 0.2412 - acc: 0.8556 - val\_loss: 0.2261 - val\_acc: 0.8590  
Epoch 14/20  
 - 0s - loss: 0.2426 - acc: 0.8778 - val\_loss: 0.2173 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2249 - acc: 0.8889 - val\_loss: 0.2089 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2360 - acc: 0.8889 - val\_loss: 0.2020 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2113 - acc: 0.8889 - val\_loss: 0.1960 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2139 - acc: 0.8889 - val\_loss: 0.1908 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2084 - acc: 0.8889 - val\_loss: 0.1848 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2220 - acc: 0.8889 - val\_loss: 0.1800 - val\_acc: 0.8718  
86/86 [==============================] - 0s 137us/step  
acc: 86.05%  
(344, 36)  
(344, 19)  
19  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4948 - acc: 0.3000 - val\_loss: 0.4886 - val\_acc: 0.1410  
Epoch 2/20  
 - 0s - loss: 0.4783 - acc: 0.3389 - val\_loss: 0.4670 - val\_acc: 0.3846  
Epoch 3/20  
 - 0s - loss: 0.4563 - acc: 0.4889 - val\_loss: 0.4319 - val\_acc: 0.5897  
Epoch 4/20  
 - 0s - loss: 0.4073 - acc: 0.6778 - val\_loss: 0.3911 - val\_acc: 0.6795  
Epoch 5/20  
 - 0s - loss: 0.3687 - acc: 0.7000 - val\_loss: 0.3515 - val\_acc: 0.7308  
Epoch 6/20  
 - 0s - loss: 0.3308 - acc: 0.7500 - val\_loss: 0.3174 - val\_acc: 0.7821  
Epoch 7/20  
 - 0s - loss: 0.3126 - acc: 0.7556 - val\_loss: 0.2914 - val\_acc: 0.7692  
Epoch 8/20  
 - 0s - loss: 0.2889 - acc: 0.7611 - val\_loss: 0.2732 - val\_acc: 0.7564  
Epoch 9/20  
 - 0s - loss: 0.2864 - acc: 0.8000 - val\_loss: 0.2591 - val\_acc: 0.7821  
Epoch 10/20  
 - 0s - loss: 0.2889 - acc: 0.8000 - val\_loss: 0.2477 - val\_acc: 0.8718  
Epoch 11/20  
 - 0s - loss: 0.2555 - acc: 0.8333 - val\_loss: 0.2381 - val\_acc: 0.8846  
Epoch 12/20  
 - 0s - loss: 0.2531 - acc: 0.8778 - val\_loss: 0.2296 - val\_acc: 0.8846  
Epoch 13/20  
 - 0s - loss: 0.2346 - acc: 0.8722 - val\_loss: 0.2222 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2366 - acc: 0.8778 - val\_loss: 0.2150 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2237 - acc: 0.8889 - val\_loss: 0.2077 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2350 - acc: 0.8889 - val\_loss: 0.2018 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2081 - acc: 0.8889 - val\_loss: 0.1971 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2134 - acc: 0.8889 - val\_loss: 0.1926 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2041 - acc: 0.8889 - val\_loss: 0.1855 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2158 - acc: 0.8889 - val\_loss: 0.1811 - val\_acc: 0.8718  
86/86 [==============================] - 0s 143us/step  
acc: 86.05%  
(344, 36)  
(344, 14)  
14  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4969 - acc: 0.2167 - val\_loss: 0.4950 - val\_acc: 0.1282  
Epoch 2/20  
 - 0s - loss: 0.4907 - acc: 0.2778 - val\_loss: 0.4845 - val\_acc: 0.2179  
Epoch 3/20  
 - 0s - loss: 0.4727 - acc: 0.4389 - val\_loss: 0.4584 - val\_acc: 0.5385  
Epoch 4/20  
 - 0s - loss: 0.4452 - acc: 0.6167 - val\_loss: 0.4278 - val\_acc: 0.6410  
Epoch 5/20  
 - 0s - loss: 0.4112 - acc: 0.6889 - val\_loss: 0.3961 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3805 - acc: 0.7333 - val\_loss: 0.3659 - val\_acc: 0.7692  
Epoch 7/20  
 - 0s - loss: 0.3536 - acc: 0.7278 - val\_loss: 0.3391 - val\_acc: 0.8077  
Epoch 8/20  
 - 0s - loss: 0.3320 - acc: 0.7444 - val\_loss: 0.3174 - val\_acc: 0.7821  
Epoch 9/20  
 - 0s - loss: 0.3119 - acc: 0.7444 - val\_loss: 0.3000 - val\_acc: 0.7949  
Epoch 10/20  
 - 0s - loss: 0.3098 - acc: 0.7611 - val\_loss: 0.2868 - val\_acc: 0.7949  
Epoch 11/20  
 - 0s - loss: 0.2887 - acc: 0.7556 - val\_loss: 0.2761 - val\_acc: 0.7821  
Epoch 12/20  
 - 0s - loss: 0.2799 - acc: 0.7667 - val\_loss: 0.2658 - val\_acc: 0.7821  
Epoch 13/20  
 - 0s - loss: 0.2681 - acc: 0.7611 - val\_loss: 0.2537 - val\_acc: 0.7692  
Epoch 14/20  
 - 0s - loss: 0.2589 - acc: 0.7778 - val\_loss: 0.2398 - val\_acc: 0.7821  
Epoch 15/20  
 - 0s - loss: 0.2418 - acc: 0.8111 - val\_loss: 0.2290 - val\_acc: 0.8462  
Epoch 16/20  
 - 0s - loss: 0.2450 - acc: 0.8333 - val\_loss: 0.2208 - val\_acc: 0.8590  
Epoch 17/20  
 - 0s - loss: 0.2304 - acc: 0.8389 - val\_loss: 0.2135 - val\_acc: 0.8590  
Epoch 18/20  
 - 0s - loss: 0.2205 - acc: 0.8833 - val\_loss: 0.2067 - val\_acc: 0.8590  
Epoch 19/20  
 - 0s - loss: 0.2131 - acc: 0.8778 - val\_loss: 0.1990 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2203 - acc: 0.8889 - val\_loss: 0.1926 - val\_acc: 0.8718  
86/86 [==============================] - 0s 186us/step  
acc: 86.05%  
(344, 36)  
(344, 17)  
17  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4936 - acc: 0.2833 - val\_loss: 0.4902 - val\_acc: 0.2564  
Epoch 2/20  
 - 0s - loss: 0.4779 - acc: 0.4389 - val\_loss: 0.4666 - val\_acc: 0.5000  
Epoch 3/20  
 - 0s - loss: 0.4502 - acc: 0.6000 - val\_loss: 0.4354 - val\_acc: 0.6026  
Epoch 4/20  
 - 0s - loss: 0.4152 - acc: 0.6500 - val\_loss: 0.4032 - val\_acc: 0.6923  
Epoch 5/20  
 - 0s - loss: 0.3852 - acc: 0.6667 - val\_loss: 0.3739 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3582 - acc: 0.6778 - val\_loss: 0.3488 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3392 - acc: 0.7056 - val\_loss: 0.3288 - val\_acc: 0.7308  
Epoch 8/20  
 - 0s - loss: 0.3188 - acc: 0.7056 - val\_loss: 0.3133 - val\_acc: 0.7436  
Epoch 9/20  
 - 0s - loss: 0.3094 - acc: 0.7222 - val\_loss: 0.3009 - val\_acc: 0.7692  
Epoch 10/20  
 - 0s - loss: 0.3143 - acc: 0.7556 - val\_loss: 0.2909 - val\_acc: 0.7821  
Epoch 11/20  
 - 0s - loss: 0.2894 - acc: 0.7389 - val\_loss: 0.2820 - val\_acc: 0.7949  
Epoch 12/20  
 - 0s - loss: 0.2842 - acc: 0.7667 - val\_loss: 0.2730 - val\_acc: 0.7821  
Epoch 13/20  
 - 0s - loss: 0.2753 - acc: 0.7444 - val\_loss: 0.2642 - val\_acc: 0.7821  
Epoch 14/20  
 - 0s - loss: 0.2675 - acc: 0.7444 - val\_loss: 0.2535 - val\_acc: 0.7949  
Epoch 15/20  
 - 0s - loss: 0.2524 - acc: 0.7833 - val\_loss: 0.2383 - val\_acc: 0.8077  
Epoch 16/20  
 - 0s - loss: 0.2541 - acc: 0.8056 - val\_loss: 0.2285 - val\_acc: 0.8462  
Epoch 17/20  
 - 0s - loss: 0.2338 - acc: 0.8611 - val\_loss: 0.2205 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2319 - acc: 0.8722 - val\_loss: 0.2129 - val\_acc: 0.8590  
Epoch 19/20  
 - 0s - loss: 0.2224 - acc: 0.8889 - val\_loss: 0.2052 - val\_acc: 0.8590  
Epoch 20/20  
 - 0s - loss: 0.2252 - acc: 0.8889 - val\_loss: 0.1983 - val\_acc: 0.8718  
86/86 [==============================] - 0s 144us/step  
acc: 86.05%  
(344, 36)  
(344, 17)  
17  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4952 - acc: 0.2556 - val\_loss: 0.4904 - val\_acc: 0.1282  
Epoch 2/20  
 - 0s - loss: 0.4823 - acc: 0.2778 - val\_loss: 0.4749 - val\_acc: 0.1667  
Epoch 3/20  
 - 0s - loss: 0.4699 - acc: 0.3389 - val\_loss: 0.4597 - val\_acc: 0.2436  
Epoch 4/20  
 - 0s - loss: 0.4486 - acc: 0.3667 - val\_loss: 0.4401 - val\_acc: 0.3462  
Epoch 5/20  
 - 0s - loss: 0.4239 - acc: 0.5056 - val\_loss: 0.4042 - val\_acc: 0.6282  
Epoch 6/20  
 - 0s - loss: 0.3852 - acc: 0.7111 - val\_loss: 0.3601 - val\_acc: 0.6923  
Epoch 7/20  
 - 0s - loss: 0.3457 - acc: 0.7389 - val\_loss: 0.3175 - val\_acc: 0.7692  
Epoch 8/20  
 - 0s - loss: 0.3074 - acc: 0.7778 - val\_loss: 0.2866 - val\_acc: 0.8462  
Epoch 9/20  
 - 0s - loss: 0.2851 - acc: 0.8556 - val\_loss: 0.2648 - val\_acc: 0.8590  
Epoch 10/20  
 - 0s - loss: 0.2933 - acc: 0.8611 - val\_loss: 0.2495 - val\_acc: 0.8590  
Epoch 11/20  
 - 0s - loss: 0.2569 - acc: 0.8722 - val\_loss: 0.2377 - val\_acc: 0.8590  
Epoch 12/20  
 - 0s - loss: 0.2551 - acc: 0.8833 - val\_loss: 0.2274 - val\_acc: 0.8590  
Epoch 13/20  
 - 0s - loss: 0.2390 - acc: 0.8778 - val\_loss: 0.2185 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2393 - acc: 0.8833 - val\_loss: 0.2098 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2332 - acc: 0.8889 - val\_loss: 0.2028 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2328 - acc: 0.8889 - val\_loss: 0.1976 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2353 - acc: 0.8889 - val\_loss: 0.1942 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2214 - acc: 0.8889 - val\_loss: 0.1937 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2185 - acc: 0.8889 - val\_loss: 0.1944 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2059 - acc: 0.8889 - val\_loss: 0.1906 - val\_acc: 0.8718  
86/86 [==============================] - 0s 146us/step  
acc: 56.98%  
(344, 36)  
(344, 20)  
20  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4944 - acc: 0.2500 - val\_loss: 0.4897 - val\_acc: 0.1282  
Epoch 2/20  
 - 0s - loss: 0.4818 - acc: 0.2556 - val\_loss: 0.4729 - val\_acc: 0.1410  
Epoch 3/20  
 - 0s - loss: 0.4646 - acc: 0.3722 - val\_loss: 0.4425 - val\_acc: 0.5769  
Epoch 4/20  
 - 0s - loss: 0.4247 - acc: 0.5722 - val\_loss: 0.4001 - val\_acc: 0.6538  
Epoch 5/20  
 - 0s - loss: 0.3921 - acc: 0.6000 - val\_loss: 0.3569 - val\_acc: 0.6923  
Epoch 6/20  
 - 0s - loss: 0.3477 - acc: 0.6944 - val\_loss: 0.3241 - val\_acc: 0.7051  
Epoch 7/20  
 - 0s - loss: 0.3271 - acc: 0.7278 - val\_loss: 0.2995 - val\_acc: 0.7308  
Epoch 8/20  
 - 0s - loss: 0.2954 - acc: 0.7722 - val\_loss: 0.2801 - val\_acc: 0.7692  
Epoch 9/20  
 - 0s - loss: 0.2837 - acc: 0.7944 - val\_loss: 0.2642 - val\_acc: 0.8205  
Epoch 10/20  
 - 0s - loss: 0.2863 - acc: 0.8278 - val\_loss: 0.2508 - val\_acc: 0.8590  
Epoch 11/20  
 - 0s - loss: 0.2548 - acc: 0.8722 - val\_loss: 0.2399 - val\_acc: 0.8590  
Epoch 12/20  
 - 0s - loss: 0.2478 - acc: 0.8833 - val\_loss: 0.2316 - val\_acc: 0.8590  
Epoch 13/20  
 - 0s - loss: 0.2215 - acc: 0.8778 - val\_loss: 0.2242 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2320 - acc: 0.8889 - val\_loss: 0.2164 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2131 - acc: 0.8889 - val\_loss: 0.2092 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2300 - acc: 0.8889 - val\_loss: 0.2028 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2134 - acc: 0.8889 - val\_loss: 0.1967 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2011 - acc: 0.8889 - val\_loss: 0.1911 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2060 - acc: 0.8889 - val\_loss: 0.1842 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2156 - acc: 0.8889 - val\_loss: 0.1791 - val\_acc: 0.8718  
86/86 [==============================] - 0s 131us/step  
acc: 59.30%  
  
(344, 36)  
(344, 19)  
19  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4958 - acc: 0.2389 - val\_loss: 0.4928 - val\_acc: 0.1667  
Epoch 2/20  
 - 0s - loss: 0.4849 - acc: 0.2722 - val\_loss: 0.4802 - val\_acc: 0.2179  
Epoch 3/20  
 - 0s - loss: 0.4697 - acc: 0.3556 - val\_loss: 0.4593 - val\_acc: 0.3462  
Epoch 4/20  
 - 0s - loss: 0.4335 - acc: 0.4889 - val\_loss: 0.4219 - val\_acc: 0.6026  
Epoch 5/20  
 - 0s - loss: 0.3991 - acc: 0.6556 - val\_loss: 0.3758 - val\_acc: 0.6667  
Epoch 6/20  
 - 0s - loss: 0.3463 - acc: 0.7389 - val\_loss: 0.3337 - val\_acc: 0.7179  
Epoch 7/20  
 - 0s - loss: 0.3218 - acc: 0.7389 - val\_loss: 0.3010 - val\_acc: 0.7949  
Epoch 8/20  
 - 0s - loss: 0.2837 - acc: 0.7944 - val\_loss: 0.2781 - val\_acc: 0.8590  
Epoch 9/20  
 - 0s - loss: 0.2791 - acc: 0.8611 - val\_loss: 0.2622 - val\_acc: 0.8462  
Epoch 10/20  
 - 0s - loss: 0.2760 - acc: 0.8556 - val\_loss: 0.2518 - val\_acc: 0.8718  
Epoch 11/20  
 - 0s - loss: 0.2500 - acc: 0.8778 - val\_loss: 0.2423 - val\_acc: 0.8718  
Epoch 12/20  
 - 0s - loss: 0.2412 - acc: 0.8889 - val\_loss: 0.2330 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2245 - acc: 0.8833 - val\_loss: 0.2240 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2311 - acc: 0.8778 - val\_loss: 0.2156 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2147 - acc: 0.8889 - val\_loss: 0.2082 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2372 - acc: 0.8889 - val\_loss: 0.2020 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2168 - acc: 0.8889 - val\_loss: 0.1967 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2204 - acc: 0.8889 - val\_loss: 0.1920 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2056 - acc: 0.8889 - val\_loss: 0.1871 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2183 - acc: 0.8889 - val\_loss: 0.1835 - val\_acc: 0.8718  
86/86 [==============================] - 0s 127us/step  
acc: 50.00%  
(344, 36)  
(344, 17)  
17  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4946 - acc: 0.3111 - val\_loss: 0.4904 - val\_acc: 0.2821  
Epoch 2/20  
 - 0s - loss: 0.4790 - acc: 0.4111 - val\_loss: 0.4625 - val\_acc: 0.5256  
Epoch 3/20  
 - 0s - loss: 0.4472 - acc: 0.5333 - val\_loss: 0.4272 - val\_acc: 0.6154  
Epoch 4/20  
 - 0s - loss: 0.4113 - acc: 0.5889 - val\_loss: 0.3918 - val\_acc: 0.6923  
Epoch 5/20  
 - 0s - loss: 0.3797 - acc: 0.6722 - val\_loss: 0.3621 - val\_acc: 0.7308  
Epoch 6/20  
 - 0s - loss: 0.3568 - acc: 0.6889 - val\_loss: 0.3380 - val\_acc: 0.7564  
Epoch 7/20  
 - 0s - loss: 0.3425 - acc: 0.6944 - val\_loss: 0.3190 - val\_acc: 0.7692  
Epoch 8/20  
 - 0s - loss: 0.3246 - acc: 0.7167 - val\_loss: 0.3053 - val\_acc: 0.7821  
Epoch 9/20  
 - 0s - loss: 0.3096 - acc: 0.7333 - val\_loss: 0.2943 - val\_acc: 0.7821  
Epoch 10/20  
 - 0s - loss: 0.3159 - acc: 0.7333 - val\_loss: 0.2848 - val\_acc: 0.7949  
Epoch 11/20  
 - 0s - loss: 0.2940 - acc: 0.7333 - val\_loss: 0.2766 - val\_acc: 0.7949  
Epoch 12/20  
 - 0s - loss: 0.2885 - acc: 0.7722 - val\_loss: 0.2682 - val\_acc: 0.7949  
Epoch 13/20  
 - 0s - loss: 0.2753 - acc: 0.7556 - val\_loss: 0.2602 - val\_acc: 0.7821  
Epoch 14/20  
 - 0s - loss: 0.2658 - acc: 0.7667 - val\_loss: 0.2459 - val\_acc: 0.7821  
Epoch 15/20  
 - 0s - loss: 0.2553 - acc: 0.7889 - val\_loss: 0.2332 - val\_acc: 0.8077  
Epoch 16/20  
 - 0s - loss: 0.2518 - acc: 0.8000 - val\_loss: 0.2235 - val\_acc: 0.8333  
Epoch 17/20  
 - 0s - loss: 0.2325 - acc: 0.8389 - val\_loss: 0.2160 - val\_acc: 0.8462  
Epoch 18/20  
 - 0s - loss: 0.2182 - acc: 0.8667 - val\_loss: 0.2094 - val\_acc: 0.8590  
Epoch 19/20  
 - 0s - loss: 0.2057 - acc: 0.8778 - val\_loss: 0.2019 - val\_acc: 0.8590  
Epoch 20/20  
 - 0s - loss: 0.2244 - acc: 0.8889 - val\_loss: 0.1960 - val\_acc: 0.8590  
86/86 [==============================] - 0s 141us/step  
acc: 86.05%  
(344, 36)  
(344, 19)  
19  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4954 - acc: 0.2667 - val\_loss: 0.4917 - val\_acc: 0.1667  
Epoch 2/20  
 - 0s - loss: 0.4803 - acc: 0.4222 - val\_loss: 0.4682 - val\_acc: 0.5256  
Epoch 3/20  
 - 0s - loss: 0.4499 - acc: 0.5778 - val\_loss: 0.4348 - val\_acc: 0.6154  
Epoch 4/20  
 - 0s - loss: 0.4079 - acc: 0.6778 - val\_loss: 0.4006 - val\_acc: 0.6667  
Epoch 5/20  
 - 0s - loss: 0.3738 - acc: 0.7056 - val\_loss: 0.3700 - val\_acc: 0.6923  
Epoch 6/20  
 - 0s - loss: 0.3450 - acc: 0.7222 - val\_loss: 0.3445 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3291 - acc: 0.7278 - val\_loss: 0.3253 - val\_acc: 0.7436  
Epoch 8/20  
 - 0s - loss: 0.3131 - acc: 0.7333 - val\_loss: 0.3120 - val\_acc: 0.7692  
Epoch 9/20  
 - 0s - loss: 0.3062 - acc: 0.7278 - val\_loss: 0.3016 - val\_acc: 0.7692  
Epoch 10/20  
 - 0s - loss: 0.3128 - acc: 0.7333 - val\_loss: 0.2926 - val\_acc: 0.7821  
Epoch 11/20  
 - 0s - loss: 0.2864 - acc: 0.7333 - val\_loss: 0.2847 - val\_acc: 0.7821  
Epoch 12/20  
 - 0s - loss: 0.2815 - acc: 0.7444 - val\_loss: 0.2770 - val\_acc: 0.7692  
Epoch 13/20  
 - 0s - loss: 0.2741 - acc: 0.7389 - val\_loss: 0.2700 - val\_acc: 0.7821  
Epoch 14/20  
 - 0s - loss: 0.2679 - acc: 0.7444 - val\_loss: 0.2615 - val\_acc: 0.7821  
Epoch 15/20  
 - 0s - loss: 0.2574 - acc: 0.7944 - val\_loss: 0.2521 - val\_acc: 0.7949  
Epoch 16/20  
 - 0s - loss: 0.2627 - acc: 0.7889 - val\_loss: 0.2367 - val\_acc: 0.8333  
Epoch 17/20  
 - 0s - loss: 0.2379 - acc: 0.8111 - val\_loss: 0.2279 - val\_acc: 0.8462  
Epoch 18/20  
 - 0s - loss: 0.2309 - acc: 0.8611 - val\_loss: 0.2206 - val\_acc: 0.8333  
Epoch 19/20  
 - 0s - loss: 0.2202 - acc: 0.8389 - val\_loss: 0.2122 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2231 - acc: 0.8889 - val\_loss: 0.2060 - val\_acc: 0.8718  
86/86 [==============================] - 0s 149us/step  
acc: 86.05%  
(344, 36)  
(344, 16)  
16  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 2s - loss: 0.4929 - acc: 0.3556 - val\_loss: 0.4884 - val\_acc: 0.1923  
Epoch 2/20  
 - 0s - loss: 0.4760 - acc: 0.4389 - val\_loss: 0.4660 - val\_acc: 0.5128  
Epoch 3/20  
 - 0s - loss: 0.4474 - acc: 0.5667 - val\_loss: 0.4350 - val\_acc: 0.6154  
Epoch 4/20  
 - 0s - loss: 0.4098 - acc: 0.6556 - val\_loss: 0.4015 - val\_acc: 0.6667  
Epoch 5/20  
 - 0s - loss: 0.3783 - acc: 0.6944 - val\_loss: 0.3704 - val\_acc: 0.6923  
Epoch 6/20  
 - 0s - loss: 0.3485 - acc: 0.7222 - val\_loss: 0.3438 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3306 - acc: 0.7111 - val\_loss: 0.3231 - val\_acc: 0.7692  
Epoch 8/20  
 - 0s - loss: 0.3113 - acc: 0.7278 - val\_loss: 0.3086 - val\_acc: 0.7692  
Epoch 9/20  
 - 0s - loss: 0.3117 - acc: 0.7333 - val\_loss: 0.2977 - val\_acc: 0.7692  
Epoch 10/20  
 - 0s - loss: 0.3174 - acc: 0.7389 - val\_loss: 0.2896 - val\_acc: 0.7821  
Epoch 11/20  
 - 0s - loss: 0.2926 - acc: 0.7389 - val\_loss: 0.2833 - val\_acc: 0.7821  
Epoch 12/20  
 - 0s - loss: 0.2827 - acc: 0.7556 - val\_loss: 0.2764 - val\_acc: 0.7692  
Epoch 13/20  
 - 0s - loss: 0.2754 - acc: 0.7389 - val\_loss: 0.2676 - val\_acc: 0.7692  
Epoch 14/20  
 - 0s - loss: 0.2720 - acc: 0.7500 - val\_loss: 0.2578 - val\_acc: 0.7692  
Epoch 15/20  
 - 0s - loss: 0.2600 - acc: 0.7889 - val\_loss: 0.2477 - val\_acc: 0.7692  
Epoch 16/20  
 - 0s - loss: 0.2573 - acc: 0.7944 - val\_loss: 0.2336 - val\_acc: 0.7949  
Epoch 17/20  
 - 0s - loss: 0.2385 - acc: 0.8444 - val\_loss: 0.2255 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2341 - acc: 0.8889 - val\_loss: 0.2171 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2214 - acc: 0.8778 - val\_loss: 0.2075 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2214 - acc: 0.8889 - val\_loss: 0.1999 - val\_acc: 0.8846  
86/86 [==============================] - 0s 168us/step  
acc: 86.05%  
(344, 36)  
(344, 16)  
16  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 3s - loss: 0.4950 - acc: 0.2889 - val\_loss: 0.4929 - val\_acc: 0.1282  
Epoch 2/20  
 - 0s - loss: 0.4826 - acc: 0.3944 - val\_loss: 0.4674 - val\_acc: 0.5128  
Epoch 3/20  
 - 0s - loss: 0.4512 - acc: 0.5389 - val\_loss: 0.4332 - val\_acc: 0.5897  
Epoch 4/20  
 - 0s - loss: 0.4171 - acc: 0.6000 - val\_loss: 0.3984 - val\_acc: 0.6538  
Epoch 5/20  
 - 0s - loss: 0.3873 - acc: 0.6556 - val\_loss: 0.3693 - val\_acc: 0.7179  
Epoch 6/20  
 - 0s - loss: 0.3620 - acc: 0.6778 - val\_loss: 0.3450 - val\_acc: 0.7436  
Epoch 7/20  
 - 0s - loss: 0.3433 - acc: 0.7056 - val\_loss: 0.3259 - val\_acc: 0.7821  
Epoch 8/20  
 - 0s - loss: 0.3266 - acc: 0.7111 - val\_loss: 0.3118 - val\_acc: 0.7821  
Epoch 9/20  
 - 0s - loss: 0.3092 - acc: 0.7333 - val\_loss: 0.3001 - val\_acc: 0.7949  
Epoch 10/20  
 - 0s - loss: 0.3130 - acc: 0.7444 - val\_loss: 0.2909 - val\_acc: 0.7821  
Epoch 11/20  
 - 0s - loss: 0.2903 - acc: 0.7333 - val\_loss: 0.2824 - val\_acc: 0.7821  
Epoch 12/20  
 - 0s - loss: 0.2866 - acc: 0.7611 - val\_loss: 0.2720 - val\_acc: 0.7692  
Epoch 13/20  
 - 0s - loss: 0.2705 - acc: 0.7500 - val\_loss: 0.2574 - val\_acc: 0.7692  
Epoch 14/20  
 - 0s - loss: 0.2577 - acc: 0.7833 - val\_loss: 0.2445 - val\_acc: 0.7949  
Epoch 15/20  
 - 0s - loss: 0.2411 - acc: 0.8167 - val\_loss: 0.2331 - val\_acc: 0.8462  
Epoch 16/20  
 - 0s - loss: 0.2430 - acc: 0.8444 - val\_loss: 0.2236 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2250 - acc: 0.8944 - val\_loss: 0.2143 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2162 - acc: 0.8889 - val\_loss: 0.2060 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2086 - acc: 0.8889 - val\_loss: 0.1985 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2130 - acc: 0.8889 - val\_loss: 0.1925 - val\_acc: 0.8718  
86/86 [==============================] - 0s 129us/step  
acc: 86.05%  
(344, 36)  
(344, 17)  
17  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 3s - loss: 0.4948 - acc: 0.2833 - val\_loss: 0.4895 - val\_acc: 0.2308  
Epoch 2/20  
 - 0s - loss: 0.4754 - acc: 0.4500 - val\_loss: 0.4604 - val\_acc: 0.5641  
Epoch 3/20  
 - 0s - loss: 0.4419 - acc: 0.6056 - val\_loss: 0.4243 - val\_acc: 0.6410  
Epoch 4/20  
 - 0s - loss: 0.4027 - acc: 0.6722 - val\_loss: 0.3885 - val\_acc: 0.6795  
Epoch 5/20  
 - 0s - loss: 0.3656 - acc: 0.6944 - val\_loss: 0.3599 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3411 - acc: 0.7222 - val\_loss: 0.3380 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3291 - acc: 0.7167 - val\_loss: 0.3225 - val\_acc: 0.7692  
Epoch 8/20  
 - 0s - loss: 0.3188 - acc: 0.7278 - val\_loss: 0.3113 - val\_acc: 0.7692  
Epoch 9/20  
 - 0s - loss: 0.3090 - acc: 0.7278 - val\_loss: 0.3020 - val\_acc: 0.7692  
Epoch 10/20  
 - 0s - loss: 0.3183 - acc: 0.7278 - val\_loss: 0.2942 - val\_acc: 0.7564  
Epoch 11/20  
 - 0s - loss: 0.2906 - acc: 0.7222 - val\_loss: 0.2870 - val\_acc: 0.7564  
Epoch 12/20  
 - 0s - loss: 0.2845 - acc: 0.7333 - val\_loss: 0.2793 - val\_acc: 0.7564  
Epoch 13/20  
 - 0s - loss: 0.2767 - acc: 0.7278 - val\_loss: 0.2721 - val\_acc: 0.7692  
Epoch 14/20  
 - 0s - loss: 0.2681 - acc: 0.7333 - val\_loss: 0.2630 - val\_acc: 0.7692  
Epoch 15/20  
 - 0s - loss: 0.2581 - acc: 0.7778 - val\_loss: 0.2527 - val\_acc: 0.8077  
Epoch 16/20  
 - 0s - loss: 0.2649 - acc: 0.7778 - val\_loss: 0.2381 - val\_acc: 0.8333  
Epoch 17/20  
 - 0s - loss: 0.2389 - acc: 0.8278 - val\_loss: 0.2296 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2304 - acc: 0.8778 - val\_loss: 0.2230 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2182 - acc: 0.8833 - val\_loss: 0.2154 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2233 - acc: 0.8889 - val\_loss: 0.2095 - val\_acc: 0.8718  
86/86 [==============================] - 0s 195us/step  
acc: 86.05%  
(344, 36)  
(344, 17)  
17  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 3s - loss: 0.4957 - acc: 0.3111 - val\_loss: 0.4925 - val\_acc: 0.1795  
Epoch 2/20  
 - 0s - loss: 0.4846 - acc: 0.3722 - val\_loss: 0.4747 - val\_acc: 0.4359  
Epoch 3/20  
 - 0s - loss: 0.4612 - acc: 0.4722 - val\_loss: 0.4401 - val\_acc: 0.6026  
Epoch 4/20  
 - 0s - loss: 0.4162 - acc: 0.6278 - val\_loss: 0.3980 - val\_acc: 0.6410  
Epoch 5/20  
 - 0s - loss: 0.3795 - acc: 0.6500 - val\_loss: 0.3555 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3357 - acc: 0.7333 - val\_loss: 0.3200 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3204 - acc: 0.7389 - val\_loss: 0.2942 - val\_acc: 0.7436  
Epoch 8/20  
 - 0s - loss: 0.2959 - acc: 0.7389 - val\_loss: 0.2753 - val\_acc: 0.8077  
Epoch 9/20  
 - 0s - loss: 0.2911 - acc: 0.7889 - val\_loss: 0.2603 - val\_acc: 0.8462  
Epoch 10/20  
 - 0s - loss: 0.2968 - acc: 0.8278 - val\_loss: 0.2482 - val\_acc: 0.8590  
Epoch 11/20  
 - 0s - loss: 0.2643 - acc: 0.8500 - val\_loss: 0.2381 - val\_acc: 0.8590  
Epoch 12/20  
 - 0s - loss: 0.2566 - acc: 0.8722 - val\_loss: 0.2289 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2384 - acc: 0.8722 - val\_loss: 0.2208 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2461 - acc: 0.8778 - val\_loss: 0.2133 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2377 - acc: 0.8889 - val\_loss: 0.2065 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2432 - acc: 0.8889 - val\_loss: 0.2014 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2381 - acc: 0.8889 - val\_loss: 0.1986 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2287 - acc: 0.8889 - val\_loss: 0.1971 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2245 - acc: 0.8889 - val\_loss: 0.1902 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2086 - acc: 0.8889 - val\_loss: 0.1849 - val\_acc: 0.8718  
86/86 [==============================] - 0s 141us/step  
acc: 86.05%  
(344, 36)  
(344, 19)  
19  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 3s - loss: 0.4948 - acc: 0.3000 - val\_loss: 0.4886 - val\_acc: 0.1410  
Epoch 2/20  
 - 0s - loss: 0.4783 - acc: 0.3389 - val\_loss: 0.4670 - val\_acc: 0.3846  
Epoch 3/20  
 - 0s - loss: 0.4563 - acc: 0.4889 - val\_loss: 0.4319 - val\_acc: 0.5897  
Epoch 4/20  
 - 0s - loss: 0.4073 - acc: 0.6778 - val\_loss: 0.3911 - val\_acc: 0.6795  
Epoch 5/20  
 - 0s - loss: 0.3687 - acc: 0.7000 - val\_loss: 0.3515 - val\_acc: 0.7308  
Epoch 6/20  
 - 0s - loss: 0.3308 - acc: 0.7500 - val\_loss: 0.3174 - val\_acc: 0.7821  
Epoch 7/20  
 - 0s - loss: 0.3126 - acc: 0.7556 - val\_loss: 0.2914 - val\_acc: 0.7692  
Epoch 8/20  
 - 0s - loss: 0.2889 - acc: 0.7611 - val\_loss: 0.2732 - val\_acc: 0.7564  
Epoch 9/20  
 - 0s - loss: 0.2864 - acc: 0.8000 - val\_loss: 0.2591 - val\_acc: 0.7821  
Epoch 10/20  
 - 0s - loss: 0.2889 - acc: 0.8000 - val\_loss: 0.2477 - val\_acc: 0.8718  
Epoch 11/20  
 - 0s - loss: 0.2555 - acc: 0.8333 - val\_loss: 0.2381 - val\_acc: 0.8846  
Epoch 12/20  
 - 0s - loss: 0.2531 - acc: 0.8778 - val\_loss: 0.2296 - val\_acc: 0.8846  
Epoch 13/20  
 - 0s - loss: 0.2346 - acc: 0.8722 - val\_loss: 0.2222 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2366 - acc: 0.8778 - val\_loss: 0.2150 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2237 - acc: 0.8889 - val\_loss: 0.2077 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2350 - acc: 0.8889 - val\_loss: 0.2018 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2081 - acc: 0.8889 - val\_loss: 0.1971 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2134 - acc: 0.8889 - val\_loss: 0.1926 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2041 - acc: 0.8889 - val\_loss: 0.1855 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2158 - acc: 0.8889 - val\_loss: 0.1811 - val\_acc: 0.8718  
86/86 [==============================] - 0s 154us/step  
acc: 86.05%  
(344, 36)  
(344, 19)  
19  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 3s - loss: 0.4962 - acc: 0.2500 - val\_loss: 0.4899 - val\_acc: 0.1538  
Epoch 2/20  
 - 0s - loss: 0.4865 - acc: 0.2278 - val\_loss: 0.4786 - val\_acc: 0.1538  
Epoch 3/20  
 - 0s - loss: 0.4728 - acc: 0.2778 - val\_loss: 0.4666 - val\_acc: 0.1538  
Epoch 4/20  
 - 0s - loss: 0.4552 - acc: 0.3111 - val\_loss: 0.4523 - val\_acc: 0.1795  
Epoch 5/20  
 - 0s - loss: 0.4395 - acc: 0.4667 - val\_loss: 0.4182 - val\_acc: 0.6667  
Epoch 6/20  
 - 0s - loss: 0.4012 - acc: 0.7500 - val\_loss: 0.3689 - val\_acc: 0.8333  
Epoch 7/20  
 - 0s - loss: 0.3547 - acc: 0.8444 - val\_loss: 0.3206 - val\_acc: 0.8718  
Epoch 8/20  
 - 0s - loss: 0.3077 - acc: 0.8611 - val\_loss: 0.2874 - val\_acc: 0.8846  
Epoch 9/20  
 - 0s - loss: 0.2810 - acc: 0.8611 - val\_loss: 0.2651 - val\_acc: 0.8846  
Epoch 10/20  
 - 0s - loss: 0.2820 - acc: 0.8778 - val\_loss: 0.2494 - val\_acc: 0.8846  
Epoch 11/20  
 - 0s - loss: 0.2456 - acc: 0.8611 - val\_loss: 0.2366 - val\_acc: 0.8718  
Epoch 12/20  
 - 0s - loss: 0.2426 - acc: 0.8889 - val\_loss: 0.2260 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2302 - acc: 0.8778 - val\_loss: 0.2167 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2198 - acc: 0.8833 - val\_loss: 0.2086 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2081 - acc: 0.8889 - val\_loss: 0.2016 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2240 - acc: 0.8889 - val\_loss: 0.1947 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2095 - acc: 0.8889 - val\_loss: 0.1884 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2039 - acc: 0.8889 - val\_loss: 0.1830 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.1922 - acc: 0.8889 - val\_loss: 0.1778 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2105 - acc: 0.8889 - val\_loss: 0.1738 - val\_acc: 0.8718  
86/86 [==============================] - 0s 128us/step  
acc: 13.95%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 3s - loss: 0.4952 - acc: 0.3167 - val\_loss: 0.4913 - val\_acc: 0.2051  
Epoch 2/20  
 - 0s - loss: 0.4812 - acc: 0.4333 - val\_loss: 0.4680 - val\_acc: 0.4615  
Epoch 3/20  
 - 0s - loss: 0.4544 - acc: 0.5111 - val\_loss: 0.4299 - val\_acc: 0.6026  
Epoch 4/20  
 - 0s - loss: 0.4047 - acc: 0.6389 - val\_loss: 0.3863 - val\_acc: 0.6410  
Epoch 5/20  
 - 0s - loss: 0.3684 - acc: 0.6611 - val\_loss: 0.3461 - val\_acc: 0.6667  
Epoch 6/20  
 - 0s - loss: 0.3294 - acc: 0.7444 - val\_loss: 0.3155 - val\_acc: 0.6923  
Epoch 7/20  
 - 0s - loss: 0.3180 - acc: 0.7333 - val\_loss: 0.2926 - val\_acc: 0.7692  
Epoch 8/20  
 - 0s - loss: 0.2950 - acc: 0.7500 - val\_loss: 0.2754 - val\_acc: 0.7692  
Epoch 9/20  
 - 0s - loss: 0.2927 - acc: 0.7944 - val\_loss: 0.2618 - val\_acc: 0.8333  
Epoch 10/20  
 - 0s - loss: 0.2975 - acc: 0.8389 - val\_loss: 0.2505 - val\_acc: 0.8462  
Epoch 11/20  
 - 0s - loss: 0.2609 - acc: 0.8500 - val\_loss: 0.2406 - val\_acc: 0.8590  
Epoch 12/20  
 - 0s - loss: 0.2528 - acc: 0.8778 - val\_loss: 0.2325 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2377 - acc: 0.8667 - val\_loss: 0.2240 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2374 - acc: 0.8778 - val\_loss: 0.2161 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2219 - acc: 0.8889 - val\_loss: 0.2089 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2397 - acc: 0.8889 - val\_loss: 0.2029 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2117 - acc: 0.8889 - val\_loss: 0.1974 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2190 - acc: 0.8889 - val\_loss: 0.1922 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2084 - acc: 0.8889 - val\_loss: 0.1860 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2143 - acc: 0.8889 - val\_loss: 0.1810 - val\_acc: 0.8718  
86/86 [==============================] - 0s 135us/step  
acc: 86.05%  
  
(344, 36)  
(344, 19)  
19  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 3s - loss: 0.4958 - acc: 0.2889 - val\_loss: 0.4932 - val\_acc: 0.1795  
Epoch 2/20  
 - 0s - loss: 0.4816 - acc: 0.4000 - val\_loss: 0.4675 - val\_acc: 0.4615  
Epoch 3/20  
 - 0s - loss: 0.4525 - acc: 0.5389 - val\_loss: 0.4287 - val\_acc: 0.6282  
Epoch 4/20  
 - 0s - loss: 0.4036 - acc: 0.6556 - val\_loss: 0.3862 - val\_acc: 0.6923  
Epoch 5/20  
 - 0s - loss: 0.3633 - acc: 0.6889 - val\_loss: 0.3468 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3300 - acc: 0.7556 - val\_loss: 0.3174 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3181 - acc: 0.7500 - val\_loss: 0.2952 - val\_acc: 0.7949  
Epoch 8/20  
 - 0s - loss: 0.2998 - acc: 0.8056 - val\_loss: 0.2782 - val\_acc: 0.8077  
Epoch 9/20  
 - 0s - loss: 0.2847 - acc: 0.8222 - val\_loss: 0.2645 - val\_acc: 0.8462  
Epoch 10/20  
 - 0s - loss: 0.2907 - acc: 0.8500 - val\_loss: 0.2533 - val\_acc: 0.8590  
Epoch 11/20  
 - 0s - loss: 0.2566 - acc: 0.8444 - val\_loss: 0.2434 - val\_acc: 0.8590  
Epoch 12/20  
 - 0s - loss: 0.2539 - acc: 0.8667 - val\_loss: 0.2344 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2375 - acc: 0.8611 - val\_loss: 0.2264 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2332 - acc: 0.8778 - val\_loss: 0.2188 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2243 - acc: 0.8889 - val\_loss: 0.2114 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2389 - acc: 0.8889 - val\_loss: 0.2052 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2169 - acc: 0.8889 - val\_loss: 0.1998 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2224 - acc: 0.8889 - val\_loss: 0.1957 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2162 - acc: 0.8889 - val\_loss: 0.1894 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2177 - acc: 0.8889 - val\_loss: 0.1848 - val\_acc: 0.8718  
86/86 [==============================] - 0s 151us/step  
acc: 79.07%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 3s - loss: 0.4955 - acc: 0.3056 - val\_loss: 0.4926 - val\_acc: 0.2179  
Epoch 2/20  
 - 0s - loss: 0.4809 - acc: 0.4278 - val\_loss: 0.4687 - val\_acc: 0.4487  
Epoch 3/20  
 - 0s - loss: 0.4531 - acc: 0.5111 - val\_loss: 0.4326 - val\_acc: 0.6154  
Epoch 4/20  
 - 0s - loss: 0.4083 - acc: 0.6556 - val\_loss: 0.3924 - val\_acc: 0.6538  
Epoch 5/20  
 - 0s - loss: 0.3715 - acc: 0.6722 - val\_loss: 0.3564 - val\_acc: 0.6667  
Epoch 6/20  
 - 0s - loss: 0.3335 - acc: 0.7278 - val\_loss: 0.3258 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3203 - acc: 0.7333 - val\_loss: 0.3015 - val\_acc: 0.7564  
Epoch 8/20  
 - 0s - loss: 0.2994 - acc: 0.7611 - val\_loss: 0.2826 - val\_acc: 0.7821  
Epoch 9/20  
 - 0s - loss: 0.2849 - acc: 0.8056 - val\_loss: 0.2672 - val\_acc: 0.8205  
Epoch 10/20  
 - 0s - loss: 0.2946 - acc: 0.8389 - val\_loss: 0.2554 - val\_acc: 0.8590  
Epoch 11/20  
 - 0s - loss: 0.2550 - acc: 0.8222 - val\_loss: 0.2458 - val\_acc: 0.8718  
Epoch 12/20  
 - 0s - loss: 0.2515 - acc: 0.8667 - val\_loss: 0.2364 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2388 - acc: 0.8667 - val\_loss: 0.2275 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2296 - acc: 0.8722 - val\_loss: 0.2193 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2188 - acc: 0.8889 - val\_loss: 0.2116 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2331 - acc: 0.8889 - val\_loss: 0.2052 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2098 - acc: 0.8889 - val\_loss: 0.1995 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2088 - acc: 0.8889 - val\_loss: 0.1945 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2043 - acc: 0.8889 - val\_loss: 0.1884 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2109 - acc: 0.8889 - val\_loss: 0.1837 - val\_acc: 0.8718  
86/86 [==============================] - 0s 135us/step  
acc: 86.05%  
(344, 36)  
(344, 17)  
17  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 3s - loss: 0.4957 - acc: 0.3111 - val\_loss: 0.4925 - val\_acc: 0.1795  
Epoch 2/20  
 - 0s - loss: 0.4846 - acc: 0.3722 - val\_loss: 0.4747 - val\_acc: 0.4359  
Epoch 3/20  
 - 0s - loss: 0.4612 - acc: 0.4722 - val\_loss: 0.4401 - val\_acc: 0.6026  
Epoch 4/20  
 - 0s - loss: 0.4162 - acc: 0.6278 - val\_loss: 0.3980 - val\_acc: 0.6410  
Epoch 5/20  
 - 0s - loss: 0.3795 - acc: 0.6500 - val\_loss: 0.3555 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3357 - acc: 0.7333 - val\_loss: 0.3200 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3204 - acc: 0.7389 - val\_loss: 0.2942 - val\_acc: 0.7436  
Epoch 8/20  
 - 0s - loss: 0.2959 - acc: 0.7389 - val\_loss: 0.2753 - val\_acc: 0.8077  
Epoch 9/20  
 - 0s - loss: 0.2911 - acc: 0.7889 - val\_loss: 0.2603 - val\_acc: 0.8462  
Epoch 10/20  
 - 0s - loss: 0.2968 - acc: 0.8278 - val\_loss: 0.2482 - val\_acc: 0.8590  
Epoch 11/20  
 - 0s - loss: 0.2643 - acc: 0.8500 - val\_loss: 0.2381 - val\_acc: 0.8590  
Epoch 12/20  
 - 0s - loss: 0.2566 - acc: 0.8722 - val\_loss: 0.2289 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2384 - acc: 0.8722 - val\_loss: 0.2208 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2461 - acc: 0.8778 - val\_loss: 0.2133 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2377 - acc: 0.8889 - val\_loss: 0.2065 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2432 - acc: 0.8889 - val\_loss: 0.2014 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2381 - acc: 0.8889 - val\_loss: 0.1986 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2287 - acc: 0.8889 - val\_loss: 0.1971 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2245 - acc: 0.8889 - val\_loss: 0.1902 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2086 - acc: 0.8889 - val\_loss: 0.1849 - val\_acc: 0.8718  
86/86 [==============================] - 0s 138us/step  
acc: 86.05%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 3s - loss: 0.4959 - acc: 0.2444 - val\_loss: 0.4929 - val\_acc: 0.1667  
Epoch 2/20  
 - 0s - loss: 0.4854 - acc: 0.2667 - val\_loss: 0.4806 - val\_acc: 0.2179  
Epoch 3/20  
 - 0s - loss: 0.4712 - acc: 0.3500 - val\_loss: 0.4630 - val\_acc: 0.2564  
Epoch 4/20  
 - 0s - loss: 0.4407 - acc: 0.4444 - val\_loss: 0.4332 - val\_acc: 0.4872  
Epoch 5/20  
 - 0s - loss: 0.4119 - acc: 0.6167 - val\_loss: 0.3890 - val\_acc: 0.6410  
Epoch 6/20  
 - 0s - loss: 0.3597 - acc: 0.7278 - val\_loss: 0.3425 - val\_acc: 0.7051  
Epoch 7/20  
 - 0s - loss: 0.3304 - acc: 0.7389 - val\_loss: 0.3045 - val\_acc: 0.7821  
Epoch 8/20  
 - 0s - loss: 0.2918 - acc: 0.7833 - val\_loss: 0.2798 - val\_acc: 0.8205  
Epoch 9/20  
 - 0s - loss: 0.2894 - acc: 0.8556 - val\_loss: 0.2632 - val\_acc: 0.8205  
Epoch 10/20  
 - 0s - loss: 0.2833 - acc: 0.8556 - val\_loss: 0.2507 - val\_acc: 0.8590  
Epoch 11/20  
 - 0s - loss: 0.2502 - acc: 0.8778 - val\_loss: 0.2402 - val\_acc: 0.8718  
Epoch 12/20  
 - 0s - loss: 0.2431 - acc: 0.8889 - val\_loss: 0.2301 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2257 - acc: 0.8833 - val\_loss: 0.2221 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2292 - acc: 0.8833 - val\_loss: 0.2136 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2145 - acc: 0.8889 - val\_loss: 0.2056 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2370 - acc: 0.8889 - val\_loss: 0.1989 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2173 - acc: 0.8889 - val\_loss: 0.1931 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2232 - acc: 0.8889 - val\_loss: 0.1890 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2050 - acc: 0.8889 - val\_loss: 0.1860 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2162 - acc: 0.8889 - val\_loss: 0.1818 - val\_acc: 0.8718  
86/86 [==============================] - 0s 138us/step  
acc: 51.16%  
(344, 36)  
(344, 21)  
21  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 3s - loss: 0.4933 - acc: 0.3000 - val\_loss: 0.4857 - val\_acc: 0.1667  
Epoch 2/20  
 - 0s - loss: 0.4760 - acc: 0.2722 - val\_loss: 0.4668 - val\_acc: 0.2179  
Epoch 3/20  
 - 0s - loss: 0.4571 - acc: 0.3500 - val\_loss: 0.4421 - val\_acc: 0.4231  
Epoch 4/20  
 - 0s - loss: 0.4120 - acc: 0.5222 - val\_loss: 0.3971 - val\_acc: 0.6538  
Epoch 5/20  
 - 0s - loss: 0.3735 - acc: 0.7111 - val\_loss: 0.3502 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3252 - acc: 0.7556 - val\_loss: 0.3140 - val\_acc: 0.7436  
Epoch 7/20  
 - 0s - loss: 0.3115 - acc: 0.7722 - val\_loss: 0.2887 - val\_acc: 0.8333  
Epoch 8/20  
 - 0s - loss: 0.2832 - acc: 0.8056 - val\_loss: 0.2713 - val\_acc: 0.8462  
Epoch 9/20  
 - 0s - loss: 0.2799 - acc: 0.8500 - val\_loss: 0.2581 - val\_acc: 0.8333  
Epoch 10/20  
 - 0s - loss: 0.2834 - acc: 0.8500 - val\_loss: 0.2471 - val\_acc: 0.8462  
Epoch 11/20  
 - 0s - loss: 0.2503 - acc: 0.8667 - val\_loss: 0.2370 - val\_acc: 0.8718  
Epoch 12/20  
 - 0s - loss: 0.2481 - acc: 0.8833 - val\_loss: 0.2283 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2338 - acc: 0.8833 - val\_loss: 0.2200 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2312 - acc: 0.8889 - val\_loss: 0.2138 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2168 - acc: 0.8889 - val\_loss: 0.2073 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2387 - acc: 0.8889 - val\_loss: 0.2019 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2138 - acc: 0.8889 - val\_loss: 0.1958 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2203 - acc: 0.8889 - val\_loss: 0.1905 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2060 - acc: 0.8889 - val\_loss: 0.1849 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2177 - acc: 0.8889 - val\_loss: 0.1815 - val\_acc: 0.8718  
86/86 [==============================] - 0s 145us/step  
acc: 86.05%  
(344, 36)  
(344, 17)  
17  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 3s - loss: 0.4957 - acc: 0.3111 - val\_loss: 0.4925 - val\_acc: 0.1795  
Epoch 2/20  
 - 0s - loss: 0.4846 - acc: 0.3722 - val\_loss: 0.4747 - val\_acc: 0.4359  
Epoch 3/20  
 - 0s - loss: 0.4612 - acc: 0.4722 - val\_loss: 0.4401 - val\_acc: 0.6026  
Epoch 4/20  
 - 0s - loss: 0.4162 - acc: 0.6278 - val\_loss: 0.3980 - val\_acc: 0.6410  
Epoch 5/20  
 - 0s - loss: 0.3795 - acc: 0.6500 - val\_loss: 0.3555 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3357 - acc: 0.7333 - val\_loss: 0.3200 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3204 - acc: 0.7389 - val\_loss: 0.2942 - val\_acc: 0.7436  
Epoch 8/20  
 - 0s - loss: 0.2959 - acc: 0.7389 - val\_loss: 0.2753 - val\_acc: 0.8077  
Epoch 9/20  
 - 0s - loss: 0.2911 - acc: 0.7889 - val\_loss: 0.2603 - val\_acc: 0.8462  
Epoch 10/20  
 - 0s - loss: 0.2968 - acc: 0.8278 - val\_loss: 0.2482 - val\_acc: 0.8590  
Epoch 11/20  
 - 0s - loss: 0.2643 - acc: 0.8500 - val\_loss: 0.2381 - val\_acc: 0.8590  
Epoch 12/20  
 - 0s - loss: 0.2566 - acc: 0.8722 - val\_loss: 0.2289 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2384 - acc: 0.8722 - val\_loss: 0.2208 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2461 - acc: 0.8778 - val\_loss: 0.2133 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2377 - acc: 0.8889 - val\_loss: 0.2065 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2432 - acc: 0.8889 - val\_loss: 0.2014 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2381 - acc: 0.8889 - val\_loss: 0.1986 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2287 - acc: 0.8889 - val\_loss: 0.1971 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2245 - acc: 0.8889 - val\_loss: 0.1902 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2086 - acc: 0.8889 - val\_loss: 0.1849 - val\_acc: 0.8718  
86/86 [==============================] - 0s 130us/step  
acc: 86.05%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 3s - loss: 0.4952 - acc: 0.2944 - val\_loss: 0.4922 - val\_acc: 0.1410  
Epoch 2/20  
 - 0s - loss: 0.4872 - acc: 0.3111 - val\_loss: 0.4774 - val\_acc: 0.3077  
Epoch 3/20  
 - 0s - loss: 0.4655 - acc: 0.4333 - val\_loss: 0.4439 - val\_acc: 0.5385  
Epoch 4/20  
 - 0s - loss: 0.4223 - acc: 0.5722 - val\_loss: 0.4013 - val\_acc: 0.6410  
Epoch 5/20  
 - 0s - loss: 0.3818 - acc: 0.6222 - val\_loss: 0.3565 - val\_acc: 0.6795  
Epoch 6/20  
 - 0s - loss: 0.3445 - acc: 0.7000 - val\_loss: 0.3202 - val\_acc: 0.7436  
Epoch 7/20  
 - 0s - loss: 0.3301 - acc: 0.7389 - val\_loss: 0.2933 - val\_acc: 0.7436  
Epoch 8/20  
 - 0s - loss: 0.3113 - acc: 0.7500 - val\_loss: 0.2742 - val\_acc: 0.7564  
Epoch 9/20  
 - 0s - loss: 0.2942 - acc: 0.7944 - val\_loss: 0.2588 - val\_acc: 0.7949  
Epoch 10/20  
 - 0s - loss: 0.3039 - acc: 0.8167 - val\_loss: 0.2469 - val\_acc: 0.8462  
Epoch 11/20  
 - 0s - loss: 0.2704 - acc: 0.8556 - val\_loss: 0.2372 - val\_acc: 0.8846  
Epoch 12/20  
 - 0s - loss: 0.2671 - acc: 0.8833 - val\_loss: 0.2286 - val\_acc: 0.8846  
Epoch 13/20  
 - 0s - loss: 0.2425 - acc: 0.8833 - val\_loss: 0.2210 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2397 - acc: 0.8889 - val\_loss: 0.2135 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2286 - acc: 0.8889 - val\_loss: 0.2063 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2431 - acc: 0.8889 - val\_loss: 0.1992 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2084 - acc: 0.8889 - val\_loss: 0.1929 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2145 - acc: 0.8889 - val\_loss: 0.1882 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2046 - acc: 0.8889 - val\_loss: 0.1832 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2206 - acc: 0.8889 - val\_loss: 0.1790 - val\_acc: 0.8718  
86/86 [==============================] - 0s 157us/step  
acc: 67.44%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 4s - loss: 0.4955 - acc: 0.3056 - val\_loss: 0.4926 - val\_acc: 0.2179  
Epoch 2/20  
 - 0s - loss: 0.4809 - acc: 0.4278 - val\_loss: 0.4687 - val\_acc: 0.4487  
Epoch 3/20  
 - 0s - loss: 0.4531 - acc: 0.5111 - val\_loss: 0.4326 - val\_acc: 0.6154  
Epoch 4/20  
 - 0s - loss: 0.4083 - acc: 0.6556 - val\_loss: 0.3924 - val\_acc: 0.6538  
Epoch 5/20  
 - 0s - loss: 0.3715 - acc: 0.6722 - val\_loss: 0.3564 - val\_acc: 0.6667  
Epoch 6/20  
 - 0s - loss: 0.3335 - acc: 0.7278 - val\_loss: 0.3258 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3203 - acc: 0.7333 - val\_loss: 0.3015 - val\_acc: 0.7564  
Epoch 8/20  
 - 0s - loss: 0.2994 - acc: 0.7611 - val\_loss: 0.2826 - val\_acc: 0.7821  
Epoch 9/20  
 - 0s - loss: 0.2849 - acc: 0.8056 - val\_loss: 0.2672 - val\_acc: 0.8205  
Epoch 10/20  
 - 0s - loss: 0.2946 - acc: 0.8389 - val\_loss: 0.2554 - val\_acc: 0.8590  
Epoch 11/20  
 - 0s - loss: 0.2550 - acc: 0.8222 - val\_loss: 0.2458 - val\_acc: 0.8718  
Epoch 12/20  
 - 0s - loss: 0.2515 - acc: 0.8667 - val\_loss: 0.2364 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2388 - acc: 0.8667 - val\_loss: 0.2275 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2296 - acc: 0.8722 - val\_loss: 0.2193 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2188 - acc: 0.8889 - val\_loss: 0.2116 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2331 - acc: 0.8889 - val\_loss: 0.2052 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2098 - acc: 0.8889 - val\_loss: 0.1995 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2088 - acc: 0.8889 - val\_loss: 0.1945 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2043 - acc: 0.8889 - val\_loss: 0.1884 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2109 - acc: 0.8889 - val\_loss: 0.1837 - val\_acc: 0.8718  
86/86 [==============================] - 0s 154us/step  
acc: 86.05%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 4s - loss: 0.4957 - acc: 0.2833 - val\_loss: 0.4913 - val\_acc: 0.1667  
Epoch 2/20  
 - 0s - loss: 0.4821 - acc: 0.4111 - val\_loss: 0.4725 - val\_acc: 0.4744  
Epoch 3/20  
 - 0s - loss: 0.4550 - acc: 0.5722 - val\_loss: 0.4408 - val\_acc: 0.5897  
Epoch 4/20  
 - 0s - loss: 0.4132 - acc: 0.6611 - val\_loss: 0.4039 - val\_acc: 0.6795  
Epoch 5/20  
 - 0s - loss: 0.3777 - acc: 0.7056 - val\_loss: 0.3685 - val\_acc: 0.7179  
Epoch 6/20  
 - 0s - loss: 0.3453 - acc: 0.7278 - val\_loss: 0.3385 - val\_acc: 0.7308  
Epoch 7/20  
 - 0s - loss: 0.3247 - acc: 0.7389 - val\_loss: 0.3114 - val\_acc: 0.7564  
Epoch 8/20  
 - 0s - loss: 0.2977 - acc: 0.7389 - val\_loss: 0.2880 - val\_acc: 0.7692  
Epoch 9/20  
 - 0s - loss: 0.2911 - acc: 0.7722 - val\_loss: 0.2709 - val\_acc: 0.7821  
Epoch 10/20  
 - 0s - loss: 0.2933 - acc: 0.7778 - val\_loss: 0.2576 - val\_acc: 0.8462  
Epoch 11/20  
 - 0s - loss: 0.2573 - acc: 0.7556 - val\_loss: 0.2467 - val\_acc: 0.8590  
Epoch 12/20  
 - 0s - loss: 0.2539 - acc: 0.8500 - val\_loss: 0.2369 - val\_acc: 0.8846  
Epoch 13/20  
 - 0s - loss: 0.2369 - acc: 0.8556 - val\_loss: 0.2282 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2392 - acc: 0.8556 - val\_loss: 0.2200 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2268 - acc: 0.8833 - val\_loss: 0.2125 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2366 - acc: 0.8833 - val\_loss: 0.2060 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2106 - acc: 0.8889 - val\_loss: 0.2002 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2114 - acc: 0.8889 - val\_loss: 0.1953 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.2039 - acc: 0.8889 - val\_loss: 0.1895 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2155 - acc: 0.8889 - val\_loss: 0.1849 - val\_acc: 0.8718  
86/86 [==============================] - 0s 163us/step  
acc: 86.05%  
(344, 36)  
(344, 18)  
18  
Train on 180 samples, validate on 78 samples  
Epoch 1/20  
 - 4s - loss: 0.4953 - acc: 0.2611 - val\_loss: 0.4892 - val\_acc: 0.1410  
Epoch 2/20  
 - 0s - loss: 0.4838 - acc: 0.2333 - val\_loss: 0.4754 - val\_acc: 0.1410  
Epoch 3/20  
 - 0s - loss: 0.4714 - acc: 0.3167 - val\_loss: 0.4602 - val\_acc: 0.2051  
Epoch 4/20  
 - 0s - loss: 0.4478 - acc: 0.4278 - val\_loss: 0.4330 - val\_acc: 0.5897  
Epoch 5/20  
 - 0s - loss: 0.4223 - acc: 0.5833 - val\_loss: 0.3879 - val\_acc: 0.7051  
Epoch 6/20  
 - 0s - loss: 0.3740 - acc: 0.6889 - val\_loss: 0.3393 - val\_acc: 0.7179  
Epoch 7/20  
 - 0s - loss: 0.3458 - acc: 0.7056 - val\_loss: 0.3070 - val\_acc: 0.7308  
Epoch 8/20  
 - 0s - loss: 0.3209 - acc: 0.7278 - val\_loss: 0.2864 - val\_acc: 0.7692  
Epoch 9/20  
 - 0s - loss: 0.3013 - acc: 0.7611 - val\_loss: 0.2668 - val\_acc: 0.8077  
Epoch 10/20  
 - 0s - loss: 0.3034 - acc: 0.7889 - val\_loss: 0.2499 - val\_acc: 0.8462  
Epoch 11/20  
 - 0s - loss: 0.2662 - acc: 0.8278 - val\_loss: 0.2366 - val\_acc: 0.8462  
Epoch 12/20  
 - 0s - loss: 0.2553 - acc: 0.8778 - val\_loss: 0.2259 - val\_acc: 0.8718  
Epoch 13/20  
 - 0s - loss: 0.2210 - acc: 0.8778 - val\_loss: 0.2181 - val\_acc: 0.8718  
Epoch 14/20  
 - 0s - loss: 0.2270 - acc: 0.8889 - val\_loss: 0.2089 - val\_acc: 0.8718  
Epoch 15/20  
 - 0s - loss: 0.2078 - acc: 0.8889 - val\_loss: 0.1995 - val\_acc: 0.8718  
Epoch 16/20  
 - 0s - loss: 0.2288 - acc: 0.8889 - val\_loss: 0.1926 - val\_acc: 0.8718  
Epoch 17/20  
 - 0s - loss: 0.2095 - acc: 0.8889 - val\_loss: 0.1866 - val\_acc: 0.8718  
Epoch 18/20  
 - 0s - loss: 0.2086 - acc: 0.8889 - val\_loss: 0.1819 - val\_acc: 0.8718  
Epoch 19/20  
 - 0s - loss: 0.1940 - acc: 0.8889 - val\_loss: 0.1794 - val\_acc: 0.8718  
Epoch 20/20  
 - 0s - loss: 0.2129 - acc: 0.8889 - val\_loss: 0.1750 - val\_acc: 0.8718  
86/86 [==============================] - 0s 126us/step  
acc: 53.49%