5.1

First, the overall regression is significant, because the “Pr>ChiSq” for the “Likelihood Ratio” is “<0.0001”. Therefore, the overall model is useful for classifying churn. However, when the “V_CSC” equals to 1, it is not significant, because the “Pr>ChiSq” is not smaller than 0.05. The “Odds Ratio” for (V_CSC=1) is 0.964 and for (V_CSC=2) is 8.318.

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	231.5567	2	<.0001
Score	324.1188	2	<.0001
Wald	249.0884	2	<.0001

Type 3 Analysis of Effects			
Effect	DF	Wald Chi-Square	Pr > ChiSq
V_CSC	2	249.0884	<.0001

Analysis of Maximum Likelihood Estimates						
Parameter		DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept		1	-2.0510	0.0726	797.6353	<.0001
V_CSC	1	1	-0.0370	0.1177	0.0988	0.7533
V_CSC	2	1	2.1184	0.1424	221.3777	<.0001

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
V_CSC 1 vs 0	0.964	0.765	1.214
V_CSC 2 vs 0	8.318	6.293	10.996

5.2

First, these two overall regressions are significant, because all the “Pr>ChiSq” for the “Likelihood Ratio” are “<0.0001”. Therefore, these two models are useful for classifying churn. And the “Odds Ratio” for these two model are similar and are a little bigger than 1, which means the event is more likely than not to occur. As a result, these two models are similar. (left: odd record, right: even record)

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	117.3843	1	<.0001
Score	113.1561	1	<.0001
Wald	104.2868	1	<.0001

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	38.0448	1	<.0001
Score	37.3803	1	<.0001
Wald	36.4687	1	<.0001

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-4.6103	0.3056	227.6530	<.0001
day_minutes	1	0.0147	0.00144	104.2868	<.0001

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-3.3066	0.2710	148.8665	<.0001
day_minutes	1	0.00807	0.00134	36.4687	<.0001

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
day_minutes	1.015	1.012	1.018

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
day_minutes	1.008	1.005	1.011

5.3

First, the overall regression is significant, because the “Pr>ChiSq” for the “Likelihood Ratio” is “<0.0001”. Therefore, the overall model is useful for classifying churn. However, not all variables contained in the model need necessarily be useful. The “Pr>ChiSq” for the “length” is not smaller than 0.05, which means that this variable is not useful for classifying churn.

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	576.8234	8	<.0001
Score	584.3725	8	<.0001
Wald	423.6524	8	<.0001

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-8.1777	0.5697	206.0143	<.0001
intl_ind	1	2.0061	0.1446	192.5881	<.0001
voice_ind	1	-0.9235	0.1436	41.3359	<.0001
V_CSC2	1	1.0632	0.0822	167.2847	<.0001
length	1	0.0538	0.1079	0.2486	0.6181
day_minutes	1	0.0127	0.00107	139.5145	<.0001
eve_minutes	1	0.00716	0.00114	39.6735	<.0001
night_minutes	1	0.00363	0.00111	10.7374	0.0010
intl_minutes	1	0.0798	0.0203	15.4322	<.0001

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
intl_ind	7.434	5.600	9.869
voice_ind	0.397	0.300	0.526
V_CSC2	2.895	2.465	3.402
length	1.055	0.854	1.304
day_minutes	1.013	1.011	1.015
eve_minutes	1.007	1.005	1.009
night_minutes	1.004	1.001	1.006
intl_minutes	1.083	1.041	1.127