

## 6202 Problem Set 1

### Commuter Van Express

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1.) Based on the simple linear regression model, the estimated regression equation to predict number of completed rides:

$$Y = 204.55 + 0.8404(\text{\# of Booked Rides})$$

```
Call:
lm(formula = rides ~ booked.ride, data = df)

Residuals:
    Min       1Q   Median       3Q      Max
-371.57  -64.47  -29.19   51.64  250.61

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  204.54863    68.30123     2.995  0.00399 **
booked.ride    0.84041     0.02252    37.312 < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 124.1 on 60 degrees of freedom
(2 observations deleted due to missingness)
Multiple R-squared:  0.9587,    Adjusted R-squared:  0.958
F-statistic: 1392 on 1 and 60 DF,  p-value: < 2.2e-16
```

In other words, holding all else constant, increasing a booked ride by 1 will increase a completed ride by 0.8404. The summary of the equation shows that estimated coefficient is highly significant with a p-value very close to 0. The  $R^2$  value is high at 0.9587. This means that the regression equation explains 95% of the sample variation in the model while 5% of the variation is explained by factors outside of the model. This high  $R^2$  suggests the regression line is a good fit.

2.) The estimated regression equation to predict revenue based on number of completed rides is:

$$Y = 232 + 3.807(\text{\# of Completed Rides})$$

```
Call:
lm(formula = revenue ~ rides, data = df)

Residuals:
    Min       1Q   Median       3Q      Max
-396.33 -166.32  -90.27  155.03  667.84

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 232.00208   147.28147   1.575    0.12
rides         3.80737    0.05331  71.418 <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 254.5 on 62 degrees of freedom
Multiple R-squared:  0.988,    Adjusted R-squared:  0.9878
F-statistic: 5101 on 1 and 62 DF,  p-value: < 2.2e-16
```

The equation suggests that, holding all else constant, increasing the amount of completed rides by 1 will increase revenue by approximately \$3.81. The coefficient of the variable is shown to be highly significant with a p-value less than 0.001. This particular regression equation also displays a high R<sup>2</sup> of 0.988, meaning the sample variation is explained by 98% of the model while only 2% is unexplained. The regression line is a very good fit.

**3.)** In this case, the full model is not the best model. The best model to predict booked rides is the one that regresses on starts session, tapped sidebar, and viewed ETA. Through backward-elimination, we found that the viewed stops variable wasn't significant in predicting booked rides. This is the best model among the others because it reported the highest multiple R<sup>2</sup> and adjusted R<sup>2</sup>. In addition, all three predictor variables are highly significant with a P-value less than 0.001. The regression equation is:

**Y = 82.99188 + 0.23936 (start sessions) – 0.63046 (tapped sidebar) – 0.15681 (viewed ETA)**

```
Call:
lm(formula = booked.ride ~ starts.session + tapped.sidebar +
    viewed.eta, data = df)

Residuals:
    Min       1Q   Median       3Q      Max
-445.89  -72.52   -6.79   85.25  273.93

Coefficients:
            Estimate Std. Error t value      Pr(>|t|)
(Intercept)  82.99188   81.87651   1.014      0.315
starts.session  0.23936    0.00796  30.071 < 2e-16 ***
tapped.sidebar -0.63046    0.11432  -5.515 0.0000008465 ***
viewed.eta    -0.15681    0.02409  -6.510 0.0000000194 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 140.8 on 58 degrees of freedom
(2 observations deleted due to missingness)
Multiple R-squared:  0.9621,    Adjusted R-squared:  0.9602
F-statistic: 491.3 on 3 and 58 DF,  p-value: < 2.2e-16
```

4.) We chose 5 for our k value because we found that seasonality occurs every 5 periods in the data. The following screenshots capture our predictions.

- MSE: 418118.536
- MAD:418.491525
- MAPE: 12.69%

date	dayofweek	rides	yhat	e	e^2	abs(e)	abs(e/y)
1/4/16	Monday	2652					
1/5/16	Tuesday	2655					
1/6/16	Wednesday	2656					
1/7/16	Thursday	2611					
1/8/16	Friday	2144					
1/11/16	Monday	2740	2543.6	196.4	38572.96	196.4	0.07167883
1/12/16	Tuesday	2662	2561.2	100.8	10160.64	100.8	0.03786627
1/13/16	Wednesday	2634	2562.6	71.4	5097.96	71.4	0.02710706
1/14/16	Thursday	2574	2558.2	15.8	249.64	15.8	0.00613831
1/15/16	Friday	2075	2550.8	-475.8	226385.64	475.8	0.2293012
1/18/16	Monday	0	2537	-2537	6436369	2537	
1/19/16	Tuesday	2812	1989	823	677329	823	0.29267425
1/20/16	Wednesday	2676	2019	657	431649	657	0.2455157
1/21/16	Thursday	2576	2027.4	548.6	300961.96	548.6	0.21296584
1/22/16	Friday	2166	2027.8	138.2	19099.24	138.2	0.06380425
1/25/16	Monday	2848	2046	802	643204	802	0.28160112
1/26/16	Tuesday	2851	2615.6	235.4	55413.16	235.4	0.08256752
1/27/16	Wednesday	2719	2623.4	95.6	9139.36	95.6	0.03515999
1/28/16	Thursday	2665	2632	33	1089	33	0.01238274
1/29/16	Friday	2075	2649.8	-574.8	330395.04	574.8	0.27701205
2/1/16	Monday	2953	2631.6	321.4	103297.96	321.4	0.10883847
2/2/16	Tuesday	2966	2652.6	313.4	98219.56	313.4	0.10566419
2/3/16	Wednesday	2825	2675.6	149.4	22320.36	149.4	0.05288496
2/4/16	Thursday	2612	2696.8	-84.8	7191.04	84.8	0.03246554
2/5/16	Friday	2042	2686.2	-644.2	414993.64	644.2	0.31547502
2/8/16	Monday	3075	2679.6	395.4	156341.16	395.4	0.12858537
2/9/16	Tuesday	3094	2704	390	152100	390	0.12605042
2/10/16	Wednesday	2969	2729.6	239.4	57312.36	239.4	0.08063321
2/11/16	Thursday	2841	2758.4	82.6	6822.76	82.6	0.02907427
2/12/16	Friday	2198	2804.2	-606.2	367478.44	606.2	0.27579618
2/15/16	Monday	0	2835.4	-2835.4	8039493.16	2835.4	
2/16/16	Tuesday	3027	2220.4	806.6	650603.56	806.6	0.26646845
2/17/16	Wednesday	2933	2207	726	527076	726	0.24752813
2/18/16	Thursday	2837	2199.8	637.2	406023.84	637.2	0.22460345
2/19/16	Friday	2350	2199	151	22801	151	0.06425532
2/22/16	Monday	3079	2229.4	849.6	721820.16	849.6	0.27593374
2/23/16	Tuesday	3072	2845.2	226.8	51438.24	226.8	0.07382813
2/24/16	Wednesday	2894	2854.2	39.8	1584.04	39.8	0.01375259
2/25/16	Thursday	2750	2846.4	-96.4	9292.96	96.4	0.03505455
2/26/16	Friday	2290	2829	-539	290521	539	0.23537118
2/29/16	Monday	3081	2817	264	69696	264	0.08568647
3/1/16	Tuesday	3268	2817.4	450.6	203040.36	450.6	0.1378825
3/2/16	Wednesday	3098	2856.6	241.4	58273.96	241.4	0.07792124
3/3/16	Thursday	2969	2897.4	71.6	5126.56	71.6	0.02411586
3/4/16	Friday	2268	2941.2	-673.2	453198.24	673.2	0.2968254
3/7/16	Monday	3011	2936.8	74.2	5505.64	74.2	0.02464298
3/8/16	Tuesday	3262	2922.8	339.2	115056.64	339.2	0.10398529
3/9/16	Wednesday	3081	2921.6	159.4	25408.36	159.4	0.05173645
3/10/16	Thursday	3026	2918.2	107.8	11620.84	107.8	0.03562459
3/11/16	Friday	2365	2929.6	-564.6	318773.16	564.6	0.2387315
3/14/16	Monday	3220	2949	271	73441	271	0.08416149
3/15/16	Tuesday	3189	2990.8	198.2	39283.24	198.2	0.06215114
3/16/16	Wednesday	3038	2976.2	61.8	3819.24	61.8	0.02034233
3/17/16	Thursday	2806	2967.6	-161.6	26114.56	161.6	0.05759088
3/18/16	Friday	2351	2923.6	-572.6	327870.76	572.6	0.24355593
3/21/16	Monday	3351	2920.8	430.2	185072.04	430.2	0.12837959
3/22/16	Tuesday	3297	2947	350	122500	350	0.10615711
3/23/16	Wednesday	3010	2968.6	41.4	1713.96	41.4	0.01375415
3/24/16	Thursday	2803	2963	-160	25600	160	0.0570817
3/25/16	Friday	2012	2962.4	-950.4	903260.16	950.4	0.47236581
3/28/16	Monday	3283	2894.6	388.4	150854.56	388.4	0.11830643
3/29/16	Tuesday	3340	2881	459	210681	459	0.13742515
3/30/16	Wednesday	3080	2889.6	190.4	36252.16	190.4	0.06181818
3/31/16	Thursday	2833	2903.6	-70.6	4984.36	70.6	0.02492058

MSE      MAD      MAPE  
418118.536   418.491525   0.12689826

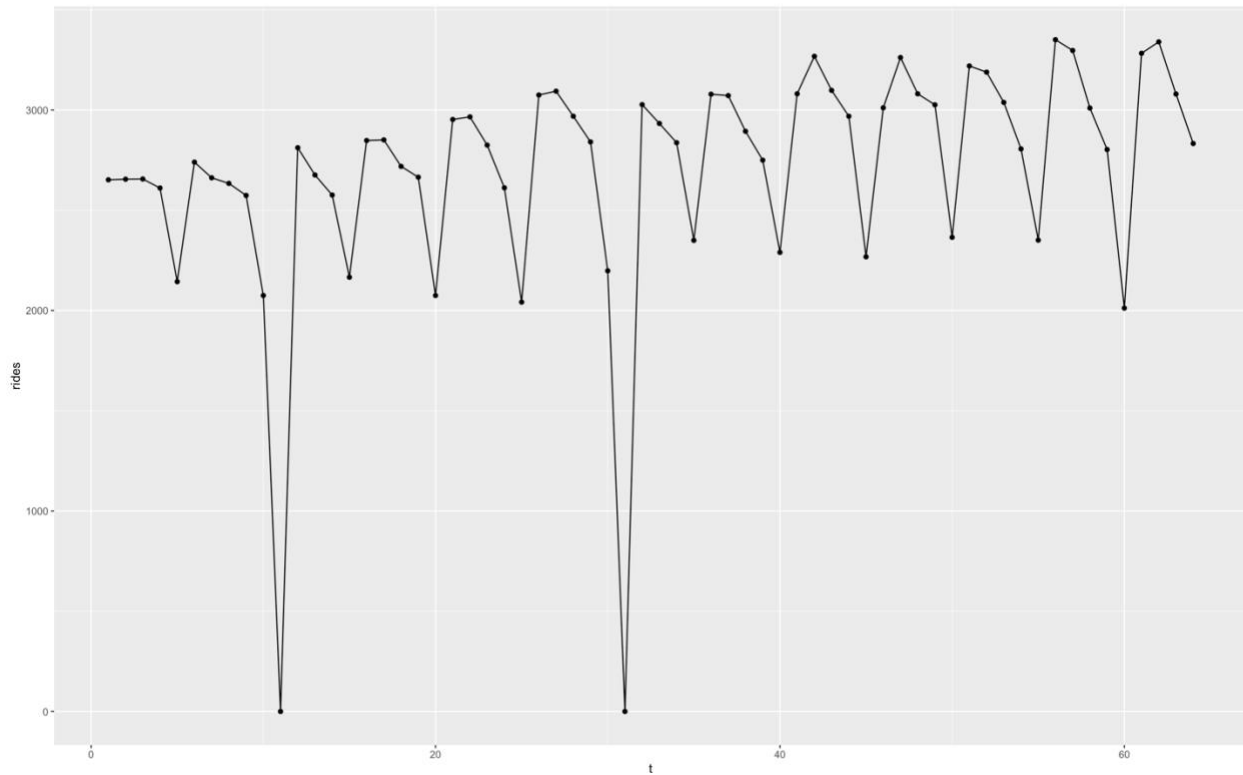
5.) For alpha, we chose 0.1 since it produced the smallest MSE compared to other alpha values. The following screenshots capture our predictions.

- **MSE:** 359393.973
- **MAD:** 404.833022
- **MAPE:** 12.27%

date	dayofweek	rides	yhat	e	e^2	abs(e)	abs(e/y)
1/4/16	Monday	2652					
1/5/16	Tuesday	2655	2652	3	9	3	0.00112994
1/6/16	Wednesday	2656	2652.3	3.7	13.69	3.7	0.00139307
1/7/16	Thursday	2611	2652.67	-41.67	1736.3889	41.67	0.0159594
1/8/16	Friday	2144	2648.503	-504.503	254523.277	504.503	0.23530924
1/11/16	Monday	2740	2598.0527	141.9473	20149.036	141.9473	0.05180558
1/12/16	Tuesday	2662	2612.24743	49.75257	2475.31822	49.75257	0.01868992
1/13/16	Wednesday	2634	2617.22269	16.777313	281.478231	16.777313	0.00636952
1/14/16	Thursday	2574	2618.90042	-44.900418	2016.04756	44.9004183	0.01744383
1/15/16	Friday	2075	2614.41038	-539.41038	290963.554	539.410376	0.25995681
1/18/16	Monday	0	2560.46934	-2560.4693	6556003.24	2560.46934	
1/19/16	Tuesday	2812	2304.4224	507.577595	257635.015	507.577595	0.18050412
1/20/16	Wednesday	2676	2355.18016	320.819836	102925.367	320.819836	0.11988783
1/21/16	Thursday	2576	2387.26215	188.737852	35621.9768	188.737852	0.0732678
1/22/16	Friday	2166	2406.13593	-240.13593	57665.2664	240.135933	0.11086608
1/25/16	Monday	2848	2382.12234	465.87766	217041.994	465.87766	0.16358064
1/26/16	Tuesday	2851	2428.71011	422.289894	178328.755	422.289894	0.14811992
1/27/16	Wednesday	2719	2470.9391	248.060905	61534.2124	248.060905	0.0912324
1/28/16	Thursday	2665	2495.74519	169.254814	28647.1921	169.254814	0.06351025
1/29/16	Friday	2075	2512.67067	-437.67067	191555.613	437.670667	0.21092562
2/1/16	Monday	2953	2468.9036	484.0964	234349.324	484.0964	0.16393376
2/2/16	Tuesday	2966	2517.31324	448.68676	201319.808	448.68676	0.15127672
2/3/16	Wednesday	2825	2562.18192	262.818084	69073.3451	262.818084	0.09303295
2/4/16	Thursday	2612	2588.46372	23.5362753	553.956253	23.5362753	0.00901083
2/5/16	Friday	2042	2590.81735	-548.81735	301200.486	548.817352	0.26876462
2/8/16	Monday	3075	2535.93562	539.064383	290590.409	539.064383	0.17530549
2/9/16	Tuesday	3094	2589.84206	504.157945	254175.233	504.157945	0.16294698
2/10/16	Wednesday	2969	2640.25785	328.74215	108071.401	328.74215	0.11072487
2/11/16	Thursday	2841	2673.13206	167.867935	28179.6437	167.867935	0.05908762
2/12/16	Friday	2198	2689.91886	-491.91886	241984.163	491.918858	0.22380294
2/15/16	Monday	0	2640.72697	-2640.727	6973438.94	2640.72697	
2/16/16	Tuesday	3027	2376.65428	650.345725	422949.562	650.345725	0.21484827
2/17/16	Wednesday	2933	2441.68885	491.311152	241386.648	491.311152	0.16751147
2/18/16	Thursday	2837	2490.81996	346.180037	119840.618	346.180037	0.12202328
2/19/16	Friday	2350	2525.43797	-175.43797	30778.4801	175.437967	0.07465445
2/22/16	Monday	3079	2507.89417	571.10583	326161.869	571.10583	0.18548419
2/23/16	Tuesday	3072	2565.00475	506.995247	257044.18	506.995247	0.16503752
2/24/16	Wednesday	2894	2615.70428	278.295722	77448.5091	278.295722	0.096163
2/25/16	Thursday	2750	2643.53385	106.46615	11335.0411	106.46615	0.03871496
2/26/16	Friday	2290	2654.18046	-364.18046	132627.411	364.180465	0.15903077
2/29/16	Monday	3081	2617.76242	463.237582	214589.057	463.237582	0.150353
3/1/16	Tuesday	3268	2664.08618	603.913823	364711.906	603.913823	0.18479615
3/2/16	Wednesday	3098	2724.47756	373.522441	139519.014	373.522441	0.1205689
3/3/16	Thursday	2969	2761.8298	207.170197	42919.4905	207.170197	0.06977777
3/4/16	Friday	2268	2782.54682	-514.54682	264758.433	514.546823	0.2268725
3/7/16	Monday	3011	2731.09214	279.90786	78348.4098	279.90786	0.09296176
3/8/16	Tuesday	3262	2759.08293	502.917074	252925.583	502.917074	0.15417446
3/9/16	Wednesday	3081	2809.37463	271.625366	73780.3396	271.625366	0.08816143
3/10/16	Thursday	3026	2836.53717	189.46283	35896.1638	189.46283	0.06261164
3/11/16	Friday	2365	2855.48345	-490.48345	240574.018	490.483453	0.20739258
3/14/16	Monday	3220	2806.43511	413.564892	171035.92	413.564892	0.1284363
3/15/16	Tuesday	3189	2847.7916	341.208403	116423.174	341.208403	0.10699542
3/16/16	Wednesday	3038	2881.91244	156.087563	24363.3272	156.087563	0.05137839
3/17/16	Thursday	2806	2897.52119	-91.521194	8376.12891	91.5211937	0.03261625
3/18/16	Friday	2351	2888.36907	-537.36907	288765.522	537.369074	0.22857043
3/21/16	Monday	3351	2834.63217	516.367833	266635.739	516.367833	0.15409365
3/22/16	Tuesday	3297	2886.26895	410.73105	168699.995	410.73105	0.12457721
3/23/16	Wednesday	3010	2927.34206	82.6579448	6832.33584	82.6579448	0.02746111
3/24/16	Thursday	2803	2935.60785	-132.60785	17584.8418	132.60785	0.04730926
3/25/16	Friday	2012	2922.34706	-910.34706	828731.778	910.347065	0.45245878
3/28/16	Monday	3283	2831.31236	451.687642	204021.726	451.687642	0.13758381
3/29/16	Tuesday	3340	2876.48112	463.518878	214849.75	463.518878	0.13877811
3/30/16	Wednesday	3080	2922.83301	157.16699	24701.4627	157.16699	0.05102824
3/31/16	Thursday	2833	2938.54971	-105.54971	11140.7411	105.549709	0.03725722

MSE            MAD            MAPE  
359393.973    404.833022    0.12274625

6.) There appears to be seasonality present and a slight upward trend. The plot clearly shows 5 day cycles with Friday being the lowest value. Two outliers are also visible due to system errors that occurred within the app.



7.) The estimated linear trend equation for number of daily completed rides is:

- $\hat{y}_t = 2352.650 + 10.611(t)$

By analyzing the linear trend equation we can conclude that on average, the number of rides increase by 10.6 per day. The  $R^2$  of the model is very low, at 0.09355. Which means that this linear trend equation only accounts for 9.355% of the dataset.

```
Call:
lm(formula = rides ~ t, data = df)

Residuals:
    Min       1Q   Median       3Q      Max
-2681.6  -133.6   183.0   320.4   469.7

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept) 2352.650     144.824  16.245  < 2e-16 ***
t           10.611       3.874   2.739  0.00804 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 572.5 on 62 degrees of freedom
Multiple R-squared:  0.1079,    Adjusted R-squared:  0.09355
F-statistic: 7.502 on 1 and 62 DF,  p-value: 0.008037
```

8.) The estimated equation is:

$$Y = 1853.226 + 382.092 (d1) + 848.663 (d2) + 693.388 (d3) + 551.344 (d4) + 10.506 (t)$$

The adjusted  $R^2$  for the model with seasonal dummy variables is low but it is still higher than the previous model's. The reported  $R^2$  for this model is 0.2828 compared to 0.09335 from the previous model. Which means that this regression model accounts for a larger portion of the dataset. By analyzing the P-values of our coefficients we can conclude that d1 (Monday) is insignificant due to the two missing values in our dataset; this is probably why the adjusted  $R$ -squared is only at 0.2828.

```
Residuals:
    Min       1Q   Median       3Q      Max
-2561.00  -53.38   29.85  128.43  566.53

Coefficients:
              Estimate Std. Error t value      Pr(>|t|)
(Intercept) 1853.226     184.909  10.022 0.0000000000000286 ***
d1           382.092     203.930   1.874    0.066021 .
d2           848.663     203.872   4.163    0.000106 ***
d3           693.388     203.872   3.401    0.001221 **
d4           551.344     203.930   2.704    0.008986 **
t            10.506       3.451   3.044    0.003504 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 509.3 on 58 degrees of freedom
Multiple R-squared:  0.3397,    Adjusted R-squared:  0.2828
F-statistic: 5.969 on 5 and 58 DF,  p-value: 0.0001612
```



9.) We used the estimated regression equation from (8) to calculate a forecast of daily completed rides for each day in our dataset. Based on the MSE, MAD and MAPE, we have concluded that the most accurate model is the regression model as it has the lowest MSE, MAD and MAPE.

- **MSE:** 235026.104
- **MAD:** 221.793484
- **MAPE:** 0.05350711

The following screenshots capture our predictions:

date	dayofweek	rides	t	Reg	Forecast	e	e^2	abs(e)	abs(e/y)
1/4/16	Monday	2652	1	2245.824	406.176	164978.943	406.176	0.15315837	
1/5/16	Tuesday	2655	2	2722.901	-67.901	4610.5458	67.901	0.02557476	
1/6/16	Wednesday	2656	3	2578.132	77.868	6063.42542	77.868	0.02931777	
1/7/16	Thursday	2611	4	2446.594	164.406	27029.3328	164.406	0.06296668	
1/8/16	Friday	2144	5	1905.756	238.244	56760.2035	238.244	0.11112127	
1/11/16	Monday	2740	6	2298.354	441.646	195051.189	441.646	0.16118467	
1/12/16	Tuesday	2662	7	2775.431	-113.431	12866.5918	113.431	0.04261119	
1/13/16	Wednesday	2634	8	2630.662	3.338	11.142244	3.338	0.00126727	
1/14/16	Thursday	2574	9	2499.124	74.876	5606.41538	74.876	0.02908936	
1/15/16	Friday	2075	10	1958.286	116.714	13622.1578	116.714	0.05624771	
1/18/16	Monday	0	11	2350.884	-2350.884	5526655.58	2350.884		
1/19/16	Tuesday	2812	12	2827.961	-15.961	254.753521	15.961	0.00567603	
1/20/16	Wednesday	2676	13	2683.192	-7.192	51.724864	7.192	0.00268759	
1/21/16	Thursday	2576	14	2551.654	24.346	592.727716	24.346	0.00945109	
1/22/16	Friday	2166	15	2010.816	155.184	24082.0739	155.184	0.07164543	
1/25/16	Monday	2848	16	2403.414	444.586	197656.711	444.586	0.15610463	
1/26/16	Tuesday	2851	17	2880.491	-29.491	869.719081	29.491	0.01034409	
1/27/16	Wednesday	2719	18	2735.722	-16.722	279.625284	16.722	0.00615006	
1/28/16	Thursday	2665	19	2604.184	60.816	3698.58586	60.816	0.02282026	
1/29/16	Friday	2075	20	2063.346	11.654	135.815716	11.654	0.00561639	
2/1/16	Monday	2953	21	2455.944	497.056	247064.667	497.056	0.16832238	
2/2/16	Tuesday	2966	22	2933.021	32.979	1087.61444	32.979	0.01111902	
2/3/16	Wednesday	2825	23	2788.252	36.748	1350.4155	36.748	0.01300814	
2/4/16	Thursday	2612	24	2656.714	-44.714	1999.3418	44.714	0.01711868	
2/5/16	Friday	2042	25	2115.876	-73.876	5457.66338	73.876	0.03617826	
2/8/16	Monday	3075	26	2508.474	566.526	320951.709	566.526	0.1842361	
2/9/16	Tuesday	3094	27	2985.551	108.449	11761.1856	108.449	0.03505139	
2/10/16	Wednesday	2969	28	2840.782	128.218	16439.8555	128.218	0.04318558	
2/11/16	Thursday	2841	29	2709.244	131.756	17359.6435	131.756	0.04637663	
2/12/16	Friday	2198	30	2168.406	29.594	875.804836	29.594	0.01346406	
2/15/16	Monday	0	31	2561.004	-2561.004	6558741.49	2561.004		
2/16/16	Tuesday	3027	32	3038.081	-11.081	122.788561	11.081	0.00366072	
2/17/16	Wednesday	2933	33	2893.312	39.688	1575.13734	39.688	0.01353154	
2/18/16	Thursday	2837	34	2761.774	75.226	5658.95108	75.226	0.02651604	
2/19/16	Friday	2350	35	2220.936	129.064	16657.5161	129.064	0.05492085	
2/22/16	Monday	3079	36	2613.534	465.466	216658.597	465.466	0.15117441	
2/23/16	Tuesday	3072	37	3090.611	-18.611	346.369321	18.611	0.00605827	
2/24/16	Wednesday	2894	38	2945.842	-51.842	2687.59296	51.842	0.01791361	
2/25/16	Thursday	2750	39	2814.304	-64.304	4135.00442	64.304	0.02338327	
2/26/16	Friday	2290	40	2273.466	16.534	273.373156	16.534	0.00722009	
2/29/16	Monday	3081	41	2666.064	414.936	172171.884	414.936	0.13467575	
3/1/16	Tuesday	3268	42	3143.141	124.859	15589.7699	124.859	0.03820655	
3/2/16	Wednesday	3098	43	2998.372	99.628	9925.73838	99.628	0.03215881	
3/3/16	Thursday	2969	44	2866.834	102.166	10437.8916	102.166	0.03441091	
3/4/16	Friday	2268	45	2325.996	-57.996	3363.53602	57.996	0.02557143	
3/7/16	Monday	3011	46	2718.594	292.406	85501.2688	292.406	0.09711259	
3/8/16	Tuesday	3262	47	3195.671	66.329	4399.53624	66.329	0.02033384	
3/9/16	Wednesday	3081	48	3050.902	30.098	905.889604	30.098	0.00976891	
3/10/16	Thursday	3026	49	2919.364	106.636	11371.2365	106.636	0.03523992	
3/11/16	Friday	2365	50	2378.526	-13.526	182.952676	13.526	0.00571924	
3/14/16	Monday	3220	51	2771.124	448.876	201489.663	448.876	0.13940248	
3/15/16	Tuesday	3189	52	3248.201	-59.201	3504.7584	59.201	0.01856413	
3/16/16	Wednesday	3038	53	3103.432	-65.432	4281.34662	65.432	0.02153785	
3/17/16	Thursday	2806	54	2971.894	-165.894	27520.8192	165.894	0.05912117	
3/18/16	Friday	2351	55	2431.056	-80.056	6408.96314	80.056	0.03405189	
3/21/16	Monday	3351	56	2823.654	527.346	278093.804	527.346	0.15736974	
3/22/16	Tuesday	3297	57	3300.731	-3.731	13.920361	3.731	0.00113163	
3/23/16	Wednesday	3010	58	3155.962	-145.962	21304.9054	145.962	0.04849236	
3/24/16	Thursday	2803	59	3024.424	-221.424	49028.5878	221.424	0.07899536	
3/25/16	Friday	2012	60	2483.586	-471.586	222393.355	471.586	0.23438668	
3/28/16	Monday	3283	61	2876.184	406.816	165499.258	406.816	0.12391593	
3/29/16	Tuesday	3340	62	3353.261	-13.261	175.854121	13.261	0.00397036	
3/30/16	Wednesday	3080	63	3208.492	-128.492	16510.1941	128.492	0.04171818	
3/31/16	Thursday	2833	64	3076.954	-243.954	59513.5541	243.954	0.08611154	

**MSE**      **MAD**      **MAPE**  
**235026.104**   **221.793484**   **0.05350711**

10) We used the estimated regression equation from (8) to forecast daily completed rides for each weekday in April 2016

date	dayofweek	t	Reg Forecast
1/4/16	Friday	65	2536.116
4/4/16	Monday	66	2928.714
5/4/16	Tuesday	67	3405.791
6/4/16	Wednesday	68	3261.022
7/4/16	Thursday	69	3129.484
8/4/16	Friday	70	2588.646
11/4/16	Monday	71	2981.244
12/4/16	Tuesday	72	3458.321
13/4/16	Wednesday	73	3313.552
14/4/16	Thursday	74	3182.014
15/4/16	Friday	75	2641.176
18/4/16	Monday	76	3033.774
19/4/16	Tuesday	77	3510.851
20/4/16	Wednesday	78	3366.082
21/4/16	Thursday	79	3234.544
22/4/16	Friday	80	2693.706
25/4/16	Monday	81	3086.304
26/4/16	Tuesday	82	3563.381
27/4/16	Wednesday	83	3418.612
28/4/16	Thursday	84	3287.074
29/4/16	Friday	85	2746.236