Sex	Smoker	Day	Time	size	total_bill	tip	Predictive tip	Error
1	0	3	0	2	16.99	1.01	2.630765768	1.620765768
0	0	3	0	3	10.34	1.66	2.207073406	0.5470734058
0	0	3	0	3	21.01	3.5	3.195514412	-0.3044855879
0	0	3	0	2	23.68	3.31	3.250509941	-0.05949005887
1	0	3	0	4	24.59	3.61	3.719502603	0.1095026028
0	0	3	0	4	25.29	4.71	3.784348779	-0.9256512206
0	0	3	0	2	8.77	2	1.869286379	-0.1307136206
0	0	3	0	4	26.88	3.12	3.931642238	0.8116422377
0	0	3	0	2	15.04	1.96	2.450122847	0.490122847
0	0	3	0	2	14.78	3.23	2.426037124	-0.8039628758
0	0	3	0	2	10.27	1.71	2.008242472	0.2982424721
1	0	3	0	4	35.26	5	4.707943609	-0.2920563909
0	0	3	0	2	15.42	1.57	2.485325057	0.9153250571
0	0	3	0	4	18.43	3	3.148856249	0.1488562487
1	0	3	0	2	14.83	3.02	2.430668994	-0.589331006
0	0	3	0	2	21.58	3.92	3.055971411	-0.8640285887
1	0	3	0	3	10.33	1.67	2.206147032	0.5361470319
0	0	3	0	3	16.29	3.71	2.758265907	-0.951734093
1	0	3	0	3	16.97	3.5	2.821259336	-0.6787406643
0	0	2	0	3	20.65	3.35	3.16216495	-0.1878350501
0	0	2	0	2	17.92	4.08	2.716918545	-1.363081455
1	0	2	0	2	20.29	2.75	2.936469172	0.1864691716
1	0	2	0	2	15.77	2.23	2.517748145	0.2877481455
0	0	2	0	4	39.42	7.58	5.093315173	-2.486684827
0	0	2	0	2	19.82	3.18	2.892929596	-0.2870704042
0	0	2	0	2	17.81	2.34	3.091421064	0.7514210637
0	0	2	0	2	13.37	2	2.295418397	0.2954183971
0	0	2	0	2	12.69	2	2.232424968	0.2324249684
0	0	2	0	2	21.7	4.3	3.067087899	-1.232912101
1	0	2	0	2	19.65	3	2.877181239	-0.1228187613
0	0	2	0	2	9.55	1.45	1.941543548	0.4915435476
0	0	2	0	4	18.35	2.5	3.141445257	0.6414452571
1	0	2	0	2	15.06	3	2.451975595	-0.5480244051
1	0	2	0	4	20.69	2.45	3.358216762	0.9082167617
0	0	2	0	2	17.78	3.27	2.70394931	-0.5660506903
0	0	2	0	3	24.06	3.6	3.478058467	-0.1219415327
0	0	2	0	3	16.31	2	2.760118655	0.7601186549
1	0	2	0	3	16.93	3.07	2.81755384	-0.2524461601
0	0	2	0	3	18.69	2.31	2.980595655	0.6705956554
0	0	2	0	3	31.27	5	4.145974086	-0.8540259136
0	0	2	0	3	16.04	2.24	2.735106558	0.4951065582
0	0	3	0	3	17.46	2.54	2.674305343	0.1343053433
0	0	3	0	2	13.94	3.06	2.348221712	-0.7117782877
0	0	3	0	2	9.68	1.32	1.953586409	0.633586409
0	0	3	0	4	30.4	5.6	4.257725869	-1.342274131
0	0	3	0	2	18.29	3	2.751194381	-0.2488056188
0	0	3	0	2	22.23	5	3.116185718	-1.883814282
0	0	3	0	4	32.4	6	4.443000659	-1.556999341
0	0	3	0	3	28.55	2.05	3.894000372	1.844000372
0	0	3	0	3	18.04	3	2.728035032	-0.2719649675
0	0	3	0	2	12.54	2.5	2.218529359	-0.2814706409
1	0	3	0	2	10.29	2.6	2.01009522	-0.58990478
1	0	3	0	4	34.81	5.2	4.666256781	-0.5337432187
0	0	3	0	2	9.94	1.56	1.977672132	0.4176721317
0	0	3	0	4	25.56	4.34	3.809360876	-0.5306391239
0	0	3	0	2	19.49	3.51	2.862359255	-0.6476407446
0	1	2	0	4	38.01	3	4.962696446	1.962696446
1	0	2	0	2	26.41	1.5	3.50341003	2.00341003
0	1	2	0	2	11.24	1.76	2.098100745	0.3381007454
0	0	2	0	4	48.27	6.73	5.91315612	-0.8168438799
0	1	2	0	2	20.29	3.21	2.936469172	-0.2735308284
0	1	2	0	2	13.81	2	2.336178851	0.3361788509
0	1	2	0	2	11.02	1.98	2.077720518	0.09772051847
0	1	2	0	4	18.29	3.76	3.135887013	-0.6241129866
0	0	2	0	3	17.59	2.64	2.878694521	0.2386945207
0	0	2	0	3	20.08	3.15	3.109361635	-0.04063836537
1	0	2	0	2	16.45	2.47	2.580741574	0.1107415742
1	1	2	0	1	3.07	1	1.148906911	0.1489069109
0	0	2	0	2	20.23	2.01	2.930910928	0.9209109278
0	1	2	0	2	15.01	2.09	2.447343725	0.3573437251
0	1	2	0	2	12.02	1.97	2.170357914	0.2003579136
1	0	2	0	3	17.07	3	2.830523075	-0.1694769248

Sum Square	247.486093
Count	243
RMSE	1.018461288

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.6832775233
R Square	0.4668681738
Adjusted R Square	0.4624254086
Standard Error	1.01547627
Observations	243

ANOVA

	df	SS	MS	F	Significance F
Regression	2	216.7257226	108.3628613	105.085043	0
Residual	240	247.486093	1.031192054		
Total	242	464.2118156			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.6721637917	0.1943918521	3.4577776	0.0006441819774	0.2892317421	1.055095841	0.2892317421	1.055095841
size	0.1923463161	0.08548604288	2.250031813	0.02535350852	0.02394756235	0.3607450698	0.02394756235	0.3607450698
total_bill	0.09263739516	0.00913720692	10.13848061	0	0.07463803285	0.1106367575	0.07463803285	0.1106367575

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.684226461
R Square	0.46816585
Adjusted R Square	0.4546446428
Standard Error	1.022798786
Observations	243

ANOVA

	df	SS	MS	F	Significance F
Regression	6	217.3281192	36.22135321	34.62455999	0
Residual	236	246.8836964	1.046117358		
Total	242	464.2118156			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	0.5754474739	0.3557784964	1.617431856	0.1071208726	-0.12545993	1.276354878
sex	0.03663251477	0.1416481773	0.2586162099	0.7961568312	-0.2424238566	0.3156888862
smoker	-0.07284433079	0.1410513294	-0.5164384562	0.606031754	-0.3507248718	0.2050362103
day	0.05300530498	0.1205826048	0.4395767123	0.6606459701	-0.1845504814	0.2905610913
time	0.1160062617	0.3085532157	0.3759684094	0.7072781413	-0.4918641845	0.723876708
size	0.1749643705	0.0893689649	1.957775507	0.05143483899	-0.00010984601	0.3510272012
total_bill	0.09426351861	0.009561371301	9.858786532	0	0.07542697845	0.1131000588

The p-values for Sex, Smoker, Day, and Time are all above 0.05, signifying that they can be safely ignored.

Subsequently, a multiple regression model was developed, utilizing only Size and Total Bill as independent variables.

To predict tips, a moving average was calculated for Size and Total Bills over the next three days.

The Size and Total Bill for the following day were estimated using this moving average.

A specific formula was employed to determine the predictive tip, and the result is presented beneath the Tips formula

Size	Total bill	Tips	Comment
3.666666667	22.90333333	3.499138758	This is the tip of next 245th row

Moving Average(Size)

Moving Average(Total Bill)

1	1	2	0	2	26.86	3.14	3.545096858	0.4050968577
1	1	2	0	2	25.28	5	3.398729773	-1.601270227
1	0	2	0	2	14.73	2.2	2.421405254	0.2214052545
0	0	2	0	2	10.51	1.25	2.030475447	0.7804754469
0	1	2	0	2	17.92	3.08	2.716918545	-0.363081455
0	0	0	1	4	27.2	4	3.961286204	-0.03871379581
0	0	0	1	2	22.76	3	3.165283538	0.1652835376
0	0	0	1	2	17.29	2.71	2.658556986	-0.05144301391
0	1	0	1	2	19.44	3	2.857727386	-0.1422726143
0	0	0	1	2	16.66	3.4	2.600195427	-0.7998045729
1	0	0	1	1	10.07	1.83	1.797368677	-0.03263132299
0	1	0	1	2	32.68	5	4.084246498	-0.9157535025
0	0	0	1	2	15.98	2.03	2.537201998	0.5072019984
1	0	0	1	4	34.83	5.17	4.668109529	-0.5018904708
0	0	0	1	2	13.03	2	2.263921683	0.2639216827
0	0	0	1	2	18.28	4	2.750268007	-1.249731993
0	0	0	1	2	24.71	5.85	3.345926458	-2.504073542
0	0	0	1	2	21.16	3	3.017063705	0.01706370534
0	1	1	0	2	28.97	3	3.740561762	0.7405617615
0	0	1	0	2	22.49	3.5	3.140271441	-0.3597285591
1	1	1	0	2	5.75	1	1.589521446	0.589521446
1	1	1	0	2	16.32	4.3	2.568698713	-1.731301287
1	0	1	0	2	22.75	3.25	3.164357164	-0.08564283636
0	1	1	0	4	40.17	4.73	5.162793219	0.4327932194
0	1	1	0	2	27.28	4	3.584004564	-0.4159954363
0	1	1	0	2	12.03	1.5	2.171284288	0.6712842876
0	1	1	0	2	21.01	3	3.003168096	0.003168096066
0	0	1	0	2	12.46	1.5	2.211118367	0.7111183675
1	1	1	0	2	11.35	2.5	2.108290859	-0.3917091411
1	1	1	0	2	15.38	3	2.481619561	-0.5183804387
1	1	2	0	3	44.3	2.5	5.353039345	2.853039345
1	1	2	0	2	22.42	3.48	3.133786823	-0.3462131768
1	0	2	0	2	20.92	4.08	2.994830731	-1.085169269
0	1	2	0	2	15.36	1.64	2.479766813	0.8397668134
0	1	2	0	2	20.49	4.06	2.954996651	-1.105003349
0	1	2	0	2	25.21	4.29	3.392245156	-0.8977548443
0	0	2	0	2	18.24	3.76	2.746562511	-1.013437489
1	1	2	0	2	14.31	4	2.382497549	-1.617502451
0	0	2	0	2	14	3	2.353779956	-0.646220044
1	0	2	0	1	7.25	1	1.536131223	0.5361312227
0	0	3	0	3	38.07	4	4.775908373	0.7759083735
0	0	3	0	2	23.95	2.55	3.275522038	0.7255220378
1	0	3	0	3	25.71	4	3.630910169	-0.3690898306
1	0	3	0	2	17.31	3.5	2.660409734	-0.839590266
0	0	3	0	4	29.93	5.07	4.214186293	-0.855813707
1	0	0	1	2	10.65	1.5	2.043444682	0.5434446823
1	0	0	1	2	12.43	1.8	2.208339246	0.4083392456
1	0	0	1	4	24.08	2.92	3.672257531	0.7522575313
0	0	0	1	2	11.69	2.31	2.139787573	-0.1702124268
1	0	0	1	2	13.42	1.68	2.300050267	0.6200502668
0	0	0	1	2	14.26	2.5	2.377865679	-0.1221343212
0	0	0	1	2	15.95	2	2.534422877	0.5344228766
1	0	0	1	2	12.48	2.52	2.212971115	-0.3070288846
1	0	0	1	6	29.8	4.2	4.586836064	0.3868360637
0	0	0	1	2	8.52	1.48	1.846127031	0.3661270306
1	0	0	1	2	14.52	2	2.401951402	0.4019514015
1	0	0	1	2	11.38	2	2.111069981	0.1110699807
0	0	0	1	3	22.82	2.18	3.363188097	1.183188097
0	0	0	1	2	19.08	1.5	2.824377923	1.324377923
1	0	0	1	2	20.27	2.83	2.934616424	0.1046164237
1	0	0	1	2	11.17	1.5	2.091616128	0.5916161277
1	0	0	1	2	12.26	2	2.192590888	0.1925908885
1	0	0	1	2	18.26	3.25	2.748415259	-0.5015847406
1	0	0	1	2	8.51	1.25	1.845200657	0.5952006566
1	0	0	1	2	10.33	2	2.013800716	0.01380071581
1	0	0	1	2	14.15	2	2.367675565	0.3676755653
0	1	0	1	2	16	2	2.539054746	0.5390547463
1	0	0	1	2	13.16	2.75	2.275964544	-0.4740354559
1	0	0	1	2	17.47	3.5	2.675231717	-0.8247682828
0	0	0	1	6	34.3	6.7	5.003704342	-1.696295658
0	0	0	1	5	41.19	5	5.449629678	0.4496296785
1	0	0	1	6	27.05	5	4.332083227	-0.667916773
1	0	0	1	2	16.43	2.3	2.578888826	0.2788888263

1	0	0	1	2	8.35	1.5	1.830378673	0.3303786734
1	0	0	1	3	18.64	1.36	2.975963786	1.615963786
1	0	0	1	2	11.87	1.63	2.156462304	0.5264623043
0	0	0	1	2	9.78	1.73	1.962850148	0.2328501485
0	0	0	1	2	7.51	2	1.752563261	-0.2474367385
0	0	3	0	2	14.07	2.5	2.360264574	-0.1397354263
0	0	3	0	2	13.13	2	2.273185422	0.2731854222
0	0	3	0	3	17.26	2.74	2.84812418	0.1081241803
0	0	3	0	4	24.55	2	3.715797107	1.715797107
0	0	3	0	4	19.77	2	3.272990358	1.272990358
1	0	3	0	5	29.85	5.14	4.399121617	-0.7408783826
0	0	3	0	6	48.17	5	6.288585013	1.288585013
1	0	3	0	4	25	3.75	3.757483935	0.007483934846
1	0	3	0	2	13.39	2.61	2.297271145	-0.312728855
0	0	3	0	4	16.49	2	2.969139702	0.9691397021
0	0	3	0	4	21.5	3.5	3.433253052	-0.0667469482
0	0	3	0	2	12.66	2.5	2.229645847	-0.2703541535
1	0	3	0	3	16.21	2	2.750854915	0.7508549154
0	0	3	0	2	13.81	2	2.336178851	0.3361788509
1	1	3	0	2	17.51	3	2.678937213	-0.321062787
0	0	3	0	3	24.52	3.48	3.520671669	0.04067166912
0	0	3	0	2	20.76	2.24	2.980008747	0.7400087473
0	0	3	0	4	31.71	4.5	4.379080856	-0.1209191437
1	1	2	0	2	10.59	1.61	2.037886439	0.4278864385
1	1	2	0	2	10.63	2	2.041591934	0.04159193435
0	1	2	0	3	50.81	10	5.956108788	-4.043891212
0	1	2	0	2	15.81	3.16	2.521453641	-0.6385463587
0	1	3	0	2	7.25	5.15	1.728477539	-3.421522461
0	1	3	0	2	31.85	3.18	4.00735746	0.8273574595
0	1	3	0	2	16.82	4	2.61501741	-1.38498259
0	1	3	0	2	32.9	3.11	4.104626724	0.9946267245
0	1	3	0	2	17.89	2	2.714139423	0.7141394232
0	1	3	0	2	14.48	2	2.398245906	0.3982459057
1	1	3	0	2	9.6	4	1.946175417	-2.053824583
0	1	3	0	2	34.63	3.55	4.264889418	0.7148894181
0	1	3	0	4	34.65	3.68	4.651434798	0.9714347981
0	1	3	0	2	23.33	5.65	3.218086853	-2.431913147
0	1	3	0	3	45.35	3.5	5.45030861	1.95030861
0	1	3	0	4	23.17	6.5	3.587957502	-2.912042498
0	1	3	0	2	40.55	3	4.813302797	1.813302797
0	0	3	0	5	20.69	5	3.550563078	-1.449436922
1	1	3	0	3	20.9	3.5	3.185324299	-0.3146757013
0	1	3	0	5	30.46	2	4.455630428	2.455630428
1	1	3	0	3	18.15	3.5	2.930571462	-0.569428538
0	1	3	0	3	23.1	4	3.389126568	-0.610873432
0	1	3	0	2	15.69	1.5	2.510337154	1.010337154
1	1	0	1	2	19.81	4.19	2.892003222	-1.297996778
0	1	0	1	2	28.44	2.56	3.691463942	1.131463942
0	1	0	1	2	15.48	2.02	2.490883301	0.4708833009
0	1	0	1	2	16.58	4	2.592784436	-1.407215564
0	0	0	1	2	7.56	1.44	1.757195131	0.3171951312
0	1	0	1	2	10.34	2	2.01472709	0.01472708976
1	1	0	1	4	43.11	5	5.435147161	0.4351471611
1	1	0	1	2	13	2	2.261142561	0.2611425609
0	1	0	1	2	13.51	2	2.308387632	0.3083876324
0	1	0	1	3	18.71	4	2.982448403	-1.017551597
1	1	0	1	2	12.74	2.01	2.237056838	0.2270568381
1	1	0	1	2	16.4	2.5	2.576109704	0.0761097044
1	1	0	1	4	20.53	4	3.343394779	-0.6566052215
0	1	0	1	3	16.47	3.23	2.774940638	-0.4550593619
1	1	0	1	3	26.59	3.41	3.712431077	0.3024310771
0	1	2	0	4	38.73	3	5.02939537	2.02939537
0	1	2	0	2	24.27	2.03	3.305166004	1.275166004
0	1	2	0	2	12.76	2.23	2.238909586	0.008909586036
1	1	2	0	3	30.06	2	4.033882838	2.033882838
0	1	2	0	4	25.89	5.16	3.839931217	-1.320068783
0	1	2	0	4	48.33	9	5.918714364	-3.081285636
0	0	2	0	2	13.27	2.5	2.286154658	-0.2138453424
1	1	2	0	3	28.17	6.5	3.858798161	-2.641201839
1	1	2	0	2	12.9	1.1	2.251878821	1.151878821
1	1	2	0	5	28.15	3	4.241638046	1.241638046
0	1	2	0	2	11.59	1.5	2.130523834	0.6305238337
0	1	2	0	2	7.74	1.44	1.773869862	0.3338698624

0	1	2	0	4	30.14	3.09	4.233640146	1.143640146
1	1	2	0	2	12.16	2.2	2.183327149	-0.01667285106
0	1	1	1	2	13.42	3.48	2.300050267	-1.179949733
1	1	1	1	1	8.58	1.92	1.659338958	-0.2606610418
0	1	1	1	3	15.98	3	2.729548314	-0.2704516855
1	0	1	1	2	13.42	1.58	2.300050267	0.7200502668
0	1	1	1	2	16.27	2.5	2.564066843	0.06406684303
1	1	1	1	2	10.09	2	1.991567741	-0.008432259029
1	1	1	1	4	20.45	3	3.335983787	0.3359837869
0	0	2	0	2	13.28	2.72	2.287081032	-0.4329189685
0	0	2	0	2	22.12	2.88	3.105995605	0.2259956047
1	1	2	0	4	24.01	2	3.665772914	1.665772914
0	1	2	0	3	15.69	3	2.70268347	-0.2973165301
0	1	2	0	2	11.61	3.39	2.132376582	-1.257623418
0	0	2	0	2	10.77	1.47	2.05456117	0.5845611697
0	0	2	0	2	15.53	3	2.495515171	-0.5044848294
0	1	2	0	2	10.07	1.25	1.989714993	0.7397149931
0	0	2	0	2	12.6	1	2.224087603	1.224087603
0	1	2	0	2	32.83	1.17	4.098142107	2.928142107
0	1	2	0	3	35.83	4.67	4.568400608	-0.1015993917
1	0	2	0	3	29.03	5.92	3.938466321	-1.981533679
0	0	2	0	2	27.18	2	3.574740824	1.574740824
1	1	2	0	2	22.67	2	3.156946172	1.156946172
0	1	2	0	2	17.82	1.75	2.707654806	0.9576548055
0	0	2	0	2	18.78	3	2.796586705	-0.2034132951