

Month/ Year	January	February	March	April	May	June	July	August	September	October	November	December
Year 2013												
Produced	31258	28281	31258	32747	32240	29770	32747	22327	29770	32747	28281	20839
Shipped	26203	33738	18977	40057	33429	18070	47283	1852	42170	30419	32223	22894
Naive Forecast		26203	33738	18977	40057	33429	18070	47283	1852	42170	30419	32223
Absolute Error		7535	14761	21080	6628	15359	29213	45431	40318	11751	1804	9329
Absolute Error Percentage		22.33%	77.78%	52.63%	19.83%	85.00%	61.78%	2453.08%	95.61%	38.63%	5.60%	40.75%
Squared Error		56776225	217887121	444366400	43930384	235898881	853399369	2063975761	1625541124	138086001	3254416	87030241
Calculated Squared Error (wrt Produced)		4319598	6148664	189608572	61102191	13389326	215409716	622782328	779406747	88795891	4569486	129597733
Cumulative Mean		26203	29971	26306	29744	30481	28412	31108	27451	29087	29220	29493
Absolute Error		7535	10994	13751	3685	12411	18871	29256	14719	1332	3003	6599
Absolute Error Percentage		22.33%	57.93%	34.33%	11.02%	68.68%	39.91%	1579.71%	34.90%	4.38%	9.32%	28.82%
Squared Error		56776225	120857042	189090001	13581068	154027957	356102060	855921895	216645281	1775408	9019210	43544401
Calculated Squared Error (wrt Produced)		4319598	1658558	41484457	6232317	505440	18787973	77101571	5376519	13397703	880662	74890300
Moving Average (2 Months)			29971	26358	29517	36743	25750	32677	24568	22011	36295	31321
Absolute Error			10994	13700	3912	18673	21534	30825	17603	8408	4072	8427
Absolute Error Percentage			57.93%	34.20%	11.70%	103.34%	45.54%	1664.39%	41.74%	27.64%	12.64%	36.81%
Squared Error			120857042	187676300	15303744	348680929	463691622	950149800	309848006	70694464	16577112	71014329
Calculated Squared Error (wrt Produced)			1658558	40823702	7415878	48624721	48962807	107104019	27064520	115258322	64210344	109874420
Moving Average (3 Months)				26306	30924	30821	30519	32927	22402	30435	24814	34937
Absolute Error				13751	2505	12751	16764	31075	19768	16	7409	12043
Absolute Error Percentage				34.33%	7.49%	70.56%	35.46%	1677.93%	46.88%	0.05%	22.99%	52.60%
Squared Error				189090001	6275025	162588001	281042872	965676342	390787003	256	54898220	145041878
Calculated Squared Error (wrt Produced)				41484457	1732411	1104901	4964769	112358738	54290231	5344617	12024927	198765822
Moving Average (5 Months)						30481	28854	31563	28138	28561	27959	30789
Absolute Error						12411	18429	29711	14032	1858	4264	7895
Absolute Error Percentage						68.68%	38.98%	1604.28%	33.27%	6.11%	13.23%	34.49%
Squared Error						154027957	339620669	882755405	196891411	3452907	18183402	62337341
Calculated Squared Error (wrt Produced)						505440	15152668	85300134	2662305	17522955	104048	99012450
Exponential (alpha = 0.1)	26203	26203	26957	26159	27548	28136	27130	29145	26416	27991	28234	28633
Absolute Error		7535	7980	13898	5881	10066	20153	27293	15754	2428	3989	5739
Absolute Error Percentage		22.33%	42.05%	34.70%	17.59%	55.71%	42.62%	1473.71%	37.36%	7.98%	12.38%	25.07%
Squared Error		56776225	63672420	193166912	34581515	101333526	406151069	744914888	248194312	5894046	15912033	32935087
Calculated Squared Error (wrt Produced)		4319598	18505913	43405603	22013137	2668001	31551059	46481526	11249592	22615811	2242	60746590
Exponential (alpha = 0.25)	26203	26203	28087	25809	29371	30386	27307	32301	24689	29059	29399	30105
Absolute Error		7535	9110	14248	4058	12316	19976	30449	17481	1360	2824	7211
Absolute Error Percentage		22.33%	48.00%	35.57%	12.14%	68.16%	42.25%	1644.10%	41.45%	4.47%	8.76%	31.50%
Squared Error		56776225	82987545	202996599	16465462	151675870	399050291	927130495	305598884	1849709	7975146	51998196
Calculated Squared Error (wrt Produced)		4319598	10059047	48129327	8231027	379233	29594536	99469202	25819040	13600481	1249042	85860191
Exponential (alpha = 0.5)	26203	26203	29971	24474	32265	32847	25459	36371	19111	30641	30530	31376
Absolute Error		7535	10994	15583	1164	14777	21824	34519	23059	222	1693	8482

Absolute Error Percentage		22.33%	57.93%	38.90%	3.48%	81.78%	46.16%	1863.87%	54.68%	0.73%	5.25%	37.05%
Squared Error		56776225	120857042	242837681	1354023	218365270	476304708	1191547338	531699106	49151	2866758	71951531
Calculated Squared Error (wrt Produced)		4319598	1658558	68444065	633	9469962	53118575	197217196	113602742	4435841	5055686	111039429
Exponential (alpha = 0.75)	26203	26203	31854	22196	35592	33970	22045	40973	11632	34536	31448	32029
Absolute Error		7535	12877	17861	2163	15900	25238	39121	30538	4117	775	9135
Absolute Error Percentage		22.33%	67.86%	44.59%	6.47%	87.99%	53.38%	2112.39%	72.42%	13.53%	2.40%	39.90%
Squared Error		56776225	165823568	319004158	4677825	252800684	636960341	1530490330	932546820	16946335	600395	83453469
Calculated Squared Error (wrt Produced)		4319598	355097	111313691	11233338	17638739	114531008	347676629	328968425	3199626	10028520	125224762
Year 2014												
Produced	32763	29642	32763	34323	32763	32763	34323	21842	32763	34323	28082	23402
Shipped	27135	34962	19637	41514	34581	18685	48953	1838	43675	31457	33346	23677
Naive Forecast	22894	27135	34962	19637	41514	34581	18685	48953	1838	43675	31457	33346
Absolute Error	4241	7827	15325	21877	6933	15896	30268	47115	41837	12218	1889	9669
Absolute Error Percentage	15.63%	22.39%	78.04%	52.70%	20.05%	85.07%	61.83%	2563.38%	95.79%	38.84%	5.66%	40.84%
Squared Error	17986081	61261929	234855625	478603129	48066489	252682816	916151824	2219823225	1750334569	149279524	3568321	93489561
Calculated Squared Error (wrt Produced)	97391858	6287412	4836783	215674524	76584704	3306101	244542708	735016034	956339006	87462497	11388323	98884112
Cumulative Mean	28943	28804	29244	28603	29410	29714	29102	30146	28731	29443	29534	29700
Absolute Error	1808	6158	9607	12911	5171	11029	19851	28308	14944	2014	3812	6023
Absolute Error Percentage	6.66%	17.61%	48.92%	31.10%	14.95%	59.03%	40.55%	1540.18%	34.22%	6.40%	11.43%	25.44%
Squared Error	3268563	37922859	92288959	166687035	26737302	121646626	394077641	801366702	223323136	4057731	14529958	36275482
Calculated Squared Error (wrt Produced)	14590984	703292	12383481	32713764	11239550	9292611	27261454	68966384	16254857	23816765	2107841	39664327
Moving Average (2 Months)	27559	25015	31049	27300	30576	38048	26633	33819	25396	22757	37566	32402
Absolute Error	424	9948	11412	14215	4006	19363	22320	31981	18280	8701	4220	8725
Absolute Error Percentage	1.56%	28.45%	58.11%	34.24%	11.58%	103.63%	45.59%	1739.99%	41.85%	27.66%	12.66%	36.85%
Squared Error	179352	98952756	130222332	202052010	16044030	374906406	498182400	1022784361	334140120	75698700	17808400	76116900
Calculated Squared Error (wrt Produced)	27084023	21418117	2938589	49327605	4783981	27928780	59133968	143452820	54276097	133780715	89939786	80991883
Moving Average (3 Months)	28512	27417	28330	27245	32038	31911	31593	34073	23159	31489	25657	36159
Absolute Error	1377	7545	8693	14269	2543	13226	17360	32235	20516	32	7689	12482
Absolute Error Percentage	5.07%	21.58%	44.27%	34.37%	7.35%	70.78%	35.46%	1753.81%	46.98%	0.10%	23.06%	52.72%
Squared Error	1896129	56921995	75574044	203613874	6468544	174918259	301358027	1039095225	420919933	1003	59125847	155808645
Calculated Squared Error (wrt Produced)	18068717	4951238	19646152	50100840	525719	726014	7450323	149601743	92238058	8032660	5883897	162750806
Moving Average (5 Months)	25912	30968	29527	27370	29228	31566	29876	32674	29114	29546	28922	31854
Absolute Error	1223	3994	9890	14144	5353	12881	19077	30836	14561	1911	4424	8177
Absolute Error Percentage	4.51%	11.42%	50.36%	34.07%	15.48%	68.94%	38.97%	1677.69%	33.34%	6.07%	13.27%	34.53%
Squared Error	1496708	15950438	97804188	200047078	28650327	165915009	363939560	950858896	212016897	3650392	19575315	66860058
Calculated Squared Error (wrt Produced)	46938000	1757557	10472546	48339500	12491498	1432645	19776355	117336105	13311781	22814583	704355	71433753
Exponential (alpha = 0.1)	28059	27967	28666	27763	29138	29683	28583	30620	27742	29335	29547	29927
Absolute Error	924	6995	9029	13751	5443	10998	20370	28782	15933	2122	3799	6250
Absolute Error Percentage	3.41%	20.01%	45.98%	33.12%	15.74%	58.86%	41.61%	1565.93%	36.48%	6.75%	11.39%	26.40%
Squared Error	853811	48935383	81525646	189083406	29622811	120946859	414943997	828394500	253871358	4502914	14430929	39063429

Calculated Squared Error (wrt Produced)	22124910	2808487	16781935	43028635	13136388	9487306	32948008	77053676	25211168	24878831	2145793	42577235
Exponential (alpha = 0.25)	28302	28010	29748	27220	30794	31741	28477	33596	25656	30161	30485	31200
Absolute Error	1167	6952	10111	14294	3787	13056	20476	31758	18019	1296	2861	7523
Absolute Error Percentage	4.30%	19.88%	51.49%	34.43%	10.95%	69.87%	41.83%	1727.85%	41.26%	4.12%	8.58%	31.77%
Squared Error	1362433	48324398	102238764	204304458	14342378	170449998	419277325	1008558061	324671663	1679579	8185260	56599411
Calculated Squared Error (wrt Produced)	19896044	2663575	9086684	50443694	3876428	1044650	34177164	138156099	50500622	17320971	5772821	60813594
Exponential (alpha = 0.5)	27135	27135	31049	25343	33428	34005	26345	37649	19743	31709	31583	32465
Absolute Error	0	7827	11412	16171	1153	15320	22608	35811	23932	252	1763	8788
Absolute Error Percentage	0.00%	22.39%	58.11%	38.95%	3.33%	81.99%	46.18%	1948.36%	54.79%	0.80%	5.29%	37.11%
Squared Error	0	61260267	130223544	261508468	1328514	234693028	511128579	1282422244	572718522	63620	3107762	77221171
Calculated Squared Error (wrt Produced)	31668969	6286879	2938407	80641923	443099	1542472	63648712	249864495	169501379	6831064	12255421	82130842
Exponential (alpha = 0.75)	25178	26646	32883	22948	36873	35154	22802	42415	11982	35752	32531	33142
Absolute Error	1957	8316	13246	18566	2292	16469	26151	40577	31693	4295	815	9465
Absolute Error Percentage	7.21%	23.79%	67.45%	44.72%	6.63%	88.14%	53.42%	2207.69%	72.56%	13.65%	2.44%	39.98%
Squared Error	3830547	69160755	175454565	344678474	5251524	271224835	683862966	1646517808	1004425545	18445579	664701	89589575
Calculated	57530853	8980605	14447	129376515	16891188	5717712	132725033	423268314	431825218	2041956	19787967	94872003
Naive Forecast MSE	334449040											
Naive Forecast CSE (Produced)	202297579											
Cumulative Mean MSE	171283589											
Cumulative Mean CSE	21896974											
Moving Average (2 Mo) MSE	229554313											
Moving Average (2 Mo) CSE (Produced)	57547893											
Moving Average (3 Mo) MSE	223385768											
Moving Average (3 Mo) CSE (Produced)	45335573											
Moving Average (5 Mo) MSE	199159682											
Moving Average (5 Mo) CSE (Produced)	30898351											
Exponential (α = 0.10) MSE	170856829											
Exponential (α = 0.10) CSE (Produced)	25032237											
Exponential (α = 0.25) MSE	198456441											
Exponential (α = 0.25) CSE (Produced)	31324481											
Exponential (α = 0.50) MSE	263055850											
Exponential (α = 0.50) CSE (Produced)	55483302											
Exponential (α = 0.75) MSE	361442914											
Exponential (α = 0.75) CSE (Produced)	104240054											
Minimum Forecast MSE	170856829											
Corresponding Forecast for MSE	α = 0.10											
Minimum CSE with respect to Produced	21896974											
Corresponding Forecast for CSE	Cumulative											