	The company still undecided between two possible marketing campaigns. In order to determine which promotion has the greater effect on sales, a different promotion is used at each location and weekly sales are recorded for the first four weeks.  We run A/B testing to help company decide which promotion has the greater effect on sales.													
					The check box below use to random sampling as the simulation.									
			Sales in 1	Thousands		Do a hypothesis	s test with a confide	ence interval of	95%.					
Promotio	on 1	Week	Promotion 1	Promotion 2	DIFF	Assumption 1								
week	SUM of SalesInThousands	1	2176.3	2619.2	442.93	IF p-value <= 0	.05, Reject HO							
1	2243.32	2	2231.4	2622.4	390.94	HO: equal vars assumed								
2	2236.38	3	2196.5	2566.0	369.51	H1: equal vars r	not assumed							
3	2242.94	4	2221.2	2644.1	422.92									
4	2175.29					Test equality of variances								
						F.Test	Do not reject HO	> We will not	reject HO since	value is greater the	an 0.05, two sam	ple have equal va	riance.	
MEAN	2224.48													
SD	32.95													
						Assumption 2								
Promotio	on 2					IF p-value <= 0	.05, Reject HO							
week	SUM of SalesInThousands					HO: mean pron	notion1 = mean pro	motion2						
1	2621.48					H1: mean prom	otion1 != mean pro	motion2						
2	2629.61													
3	2555.76					Test equality of means (two-sample equal variance)								
4	2601.67					T.Test	Reject HO	> We reject H	O since p value	is less than 0.05, the	at mean the aver	age sales of prom	otion 1 is not equal	to promotion 2.
MEAN	2602.13					MEAN DIFF	406.58	> The value of	of mean difference	e of sales from pron	notion 1 & 2			
SD	33.07													
						Conclusion								
						With the confider	nce of 95%, we can	onclude that the	promotion 2 ha	s the greater effect of	n sales and help	to increase sales	significantly.	
							Promotion 2 - Promot							ina)

Dataset			
Promotion	week		SalesInThousands
	2	1	33.73
	2	2	35.67
	2	3	29.03
	2	4	39.25
	1	1	27.81
	1	2	34.67
	1	3	27.98
	1	4	27.72
	1	1	39.28
	1	2	39.8
	1	3	24.77
	1	4	30.98
	1	1	30.37
	1	2	24.82
	1	3	37.47
	1	4	23.35
	2	1	32.9
	2	2	22.18
	2	3	42.98
	2	4	26.68
	1	1	30.08
	1	2	28.62
	1	3	25.4
	1	4	27.26
	1	1	34.27
	1	2	29.3
	1	3	23.93
	1	4	35.16

2	1	33.42	
2	2	37.93	
2	3	33.85	
2	4	40.25	
2	1	61.59	
2	2	63.64	
2	3	54.68	
2	4	61.24	
2	1	62.93	
2	2	58.77	
2	3	70.6	
2	4	65.06	
2	1	59.76	
2	2	66.11	
2	3	62.16	
2	4	64.04	
2	1	59.65	
2	2	57.04	
2	3	59.73	
2	4	56.72	
2	1	58.55	
2	2	62.19	
2	3	53.14	
2	4	62.27	
2	1	86.14	
2	2	82.56	
2	3	79.36	
2	4	77.17	
2	1	89.7	
2	2	78.43	
2	3	84.05	

2	4	81.18	
1	1	87.43	
1	2	81.79	
1	3	88.12	
1	4	75.29	
2	1	83.02	
2	2	90.3	
2	3	85.18	
2	4	89.77	
2	1	82.64	
2	2	82.89	
2	3	82.13	
2	4	88.91	
2	1	87.7	
2	2	81.16	
2	3	81.58	
2	4	94.21	
2	1	96.48	
2	2	84.13	
2	3	91.98	
2	4	81.72	
1	1	88.64	
1	2	81.37	
1	3	82.14	
1	4	79.64	
2	1	84.34	
2	2	87.9	
2	3	76.12	
2	4	82.72	
1	1	73.22	
1	2	75.88	

1	3	78.01	
4		7 0.0 1	
1	4	80.17	
1	1	82.65	
1	2	77.39	
1	3	80.83	
1	4	80.75	
2	1	94.89	
2	2	74.75	
2	3	93.63	
2	4	80.82	
2	1	91.61	
2	2	79.02	
2	3	86.11	
2	4	82.88	
1	1	66.22	
1	2	82.86	
1	3	83.4	
1	4	75.61	
1	1	79.53	
1	2	74.03	
1	3	78.53	
1	4	76.71	
1	1	49.61	
1	2	43.69	
1	3	54.49	
1	4	61.25	
2	1	51.47	
2	2	53.47	
2	3	46.83	
2	4	56.7	
1	1	47.89	

1       2       52.37         1       3       49.11         1       4       52.88         1       1       46.98         1       2       53.41         1       3       36.17         1       4       55.98         1       1       51.87         1       2       58.01         1       3       47.93         1       4       51.33         2       1       52.23         2       2       51.68         2       3       46.22         2       4       46.03         1       40.4         1       2       50.28         1       3       52.72         1       4       38.3         1       1       51.79         1       2       42.56         1       3       44.64         1       4       45.11         1       42.15       42.59         1       39.25
1       4       52.88         1       1       46.98         1       2       53.41         1       3       36.17         1       4       55.98         1       1       51.87         1       2       58.01         1       3       47.93         1       4       51.33         2       1       52.23         2       2       51.68         2       3       46.22         2       4       46.03         1       1       40.4         1       2       50.28         1       3       52.72         1       4       38.3         1       1       51.79         1       2       42.56         1       3       44.64         1       4       45.11         1       42.15       42.59         1       3       49.56
1       1       46.98         1       2       53.41         1       3       36.17         1       4       55.98         1       1       51.87         1       2       58.01         1       3       47.93         1       4       51.33         2       1       52.23         2       2       51.68         2       3       46.22         2       4       46.03         1       1       40.4         1       2       50.28         1       3       52.72         1       4       38.3         1       1       51.79         1       2       42.56         1       3       44.64         1       4       45.11         1       42.59         1       3       49.56
1       2       53.41         1       3       36.17         1       4       55.98         1       1       51.87         1       2       58.01         1       3       47.93         1       4       51.33         2       1       52.23         2       2       51.68         2       3       46.22         2       4       46.03         1       1       40.4         2       50.28         1       3       52.72         1       4       38.3         1       1       51.79         1       2       42.56         1       3       44.64         1       4       45.11         1       42.15         1       2       42.59         1       3       49.56
1       3       36.17         1       4       55.98         1       1       51.87         1       2       58.01         1       3       47.93         1       4       51.33         2       1       52.23         2       2       51.68         2       3       46.22         2       4       46.03         1       1       40.4         1       2       50.28         1       3       52.72         1       4       38.3         1       1       51.79         1       2       42.56         1       3       44.64         1       4       45.11         1       42.15       42.59         1       3       49.56
1       4       55.98         1       1       51.87         1       2       58.01         1       3       47.93         1       4       51.33         2       1       52.23         2       2       51.68         2       3       46.22         2       4       46.03         1       1       40.4         1       2       50.28         1       3       52.72         1       4       38.3         1       1       51.79         1       2       42.56         1       3       44.64         1       4       45.11         1       42.15       42.59         1       3       49.56
1       1       51.87         1       2       58.01         1       3       47.93         1       4       51.33         2       1       52.23         2       2       51.68         2       3       46.22         2       4       46.03         1       1       40.4         1       2       50.28         1       3       52.72         1       4       38.3         1       1       51.79         1       2       42.56         1       3       44.64         1       4       45.11         1       42.15         1       2       42.59         1       3       49.56
1       2       58.01         1       3       47.93         1       4       51.33         2       1       52.23         2       2       51.68         2       3       46.22         2       4       46.03         1       1       40.4         1       2       50.28         1       3       52.72         1       4       38.3         1       1       51.79         1       2       42.56         1       3       44.64         1       4       45.11         1       42.15         1       2       42.59         1       3       49.56
1       3       47.93         1       4       51.33         2       1       52.23         2       2       51.68         2       3       46.22         2       4       46.03         1       1       40.4         1       2       50.28         1       3       52.72         1       4       38.3         1       1       51.79         1       2       42.56         1       3       44.64         1       4       45.11         1       42.15         1       2       42.59         1       3       49.56
1       4       51.33         2       1       52.23         2       2       51.68         2       3       46.22         2       4       46.03         1       1       40.4         1       2       50.28         1       3       52.72         1       4       38.3         1       1       51.79         1       2       42.56         1       3       44.64         1       4       45.11         1       42.15         1       2       42.59         1       3       49.56
2       1       52.23         2       51.68         2       3       46.22         2       4       46.03         1       1       40.4         1       2       50.28         1       3       52.72         1       4       38.3         1       1       51.79         1       2       42.56         1       3       44.64         1       4       45.11         1       42.15         1       2       42.59         1       3       49.56
2       2       51.68         2       3       46.22         2       4       46.03         1       1       40.4         1       2       50.28         1       3       52.72         1       4       38.3         1       1       51.79         1       2       42.56         1       3       44.64         1       4       45.11         1       42.15         1       2       42.59         1       3       49.56
2
2     4     46.03       1     1     40.4       1     2     50.28       1     3     52.72       1     4     38.3       1     1     51.79       1     2     42.56       1     3     44.64       1     4     45.11       1     1     42.15       1     2     42.59       1     3     49.56
1     1     40.4       1     2     50.28       1     3     52.72       1     4     38.3       1     51.79       1     2     42.56       1     3     44.64       1     4     45.11       1     1     42.15       1     2     42.59       1     3     49.56
1     2     50.28       1     3     52.72       1     4     38.3       1     51.79       1     2     42.56       1     3     44.64       1     4     45.11       1     1     42.15       1     2     42.59       1     3     49.56
1     3     52.72       1     4     38.3       1     1     51.79       1     2     42.56       1     3     44.64       1     4     45.11       1     1     42.15       1     2     42.59       1     3     49.56
1     4     38.3       1     1     51.79       1     2     42.56       1     3     44.64       1     4     45.11       1     1     42.15       1     2     42.59       1     3     49.56
1     1     51.79       1     2     42.56       1     3     44.64       1     4     45.11       1     1     42.15       1     2     42.59       1     3     49.56
1 2 42.56 1 3 44.64 1 4 45.11 1 1 42.15 1 2 42.59 1 3 49.56
1 3 44.64 1 4 45.11 1 1 42.15 1 2 42.59 1 3 49.56
1 4 45.11 1 1 42.15 1 2 42.59 1 3 49.56
1 1 42.15 1 2 42.59 1 3 49.56
1 2 42.59 1 3 49.56
1 3 49.56
1 / 20.25
1 4 39.23
1 1 48.18
1 2 48.25
1 3 46.42
1 4 43.77

1	1	45.3	
1	2	48.84	
1	3	45.08	
1	4	44.67	
2	1	45.56	
2	2	55.19	
2	3	37.84	
2	4	50.07	
1	1	47.33	
1	2	45.42	
1	3	44.31	
1	4	40.26	
1	1	43.27	
1	2	48.33	
1	3	44.14	
1	4	51.5	
2	1	50.11	
2	2	55.59	
2	3	54.37	
2	4	51.91	
1	1	46.26	
1	2	47.71	
1	3	54.09	
1	4	46.89	
2	1	57.37	
2	2	55.53	
2	3	51.16	
2	4	57.06	
2	1	50.59	
2	2	48.64	
2	3	50.55	

2	4	49.08	
2	1	24.75	
2	2	41.47	
2	3	35.1	
2	4	34.33	
1	1	31.94	
1	2	29.64	
1	3	33.64	
1	4	36.05	
1	1	36.7	
1	2	41.53	
1	3	27.71	
1	4	37.2	
1	1	32.21	
1	2	38.41	
1	3	37.9	
1	4	44.84	
1	1	37.45	
1	2	35.46	
1	3	31.85	
1	4	19.26	
1	1	38.65	
1	2	17.34	
1	3	33.14	
1	4	23.44	
2	1	37.17	
2	2	30.52	
2	3	32.51	
2	4	29.12	
1	1	32.77	
1	2	30.26	

1	3	27.55	
1	4	27.37	
2	1	47.48	
2	2	39.41	
2	3	43.29	
2	4	42.59	
2	1	34.46	
2	2	40.13	
2	3	32.18	
2	4	43.73	
2	1	49.01	
2	2	46.29	
2	3	37.14	
2	4	42.82	
2	1	47.22	
2	2	35.24	
2	3	47.22	
2	4	43.15	
1	1	40.71	
1	2	38.26	
1	3	41.44	
1	4	25.7	
2	1	40.29	
2	2	48.35	
2	3	43.26	
2	4	44.2	
2	1	46.14	
2	2	41.12	
2	3	45.03	
2	4	38.85	
2	1	41.96	

2	2	42.27	
2	3	38.51	
2	4	43.51	
1	1	49.39	
1	2	40.25	
1	3	42.46	
1	4	31.62	
2	1	40.43	
2	2	51.15	
2	3	42.5	
2	4	52.76	
2	1	47.63	
2	2	52.21	
2	3	40.17	
2	4	48.36	
1	1	38.56	
1	2	37.29	
1	3	35.6	
1	4	33.35	
1	1	48.5	
1	2	36.8	
1	3	48.32	
1	4	41.54	
2	1	53.56	
2	2	49.72	
2	3	48.77	
2	4	46.84	
2	1	49.67	
2	2	49.98	
2	3	49.5	
2	4	47.35	

2	1	50.26	
2	2	52.05	
2	3	51.14	
2	4	46.3	
1	1	32.61	
1	2	57.27	
1	3	37.32	
1	4	41.22	
1	1	39.73	
1	2	50.3	
1	3	40.16	
1	4	41.37	
2	1	54.79	
2	2	52.39	
2	3	42.15	
2	4	49.63	
2	1	48.06	
2	2	51.09	
2	3	44.19	
2	4	49.52	
1	1	48.76	
1	2	44.14	
1	3	58.1	
1	4	44.16	
2	1	44.66	
2	2	53.78	
2	3	43.91	
2	4	52.41	
2	1	50.94	
2	2	49.38	
2	3	63.98	

2	4	45.84	
2	1	51.01	
2	2	56.16	
2	3	45.77	
2	4	46.47	
1	1	46.02	
1	2	51.09	
1	3	51.68	
1	4	55.91	
2	1	55.9	
2	2	59.8	
2	3	60.97	
2	4	64.14	
2	1	39.98	
2	2	54.58	
2	3	52.64	
2	4	45.43	
1	1	53.76	
1	2	39.36	
1	3	47.2	
1	4	53.66	
2	1	51.89	
2	2	51.17	
2	3	54.33	
2	4	50.05	
1	1	51.09	
1	2	54.82	
1	3	44.16	
1	4	53.95	
2	1	54.34	
2	2	60.24	

2				
1       1       51.26         1       2       51.73         1       3       51.35         1       4       41.85         1       1       45.21         1       2       55.02         1       3       45.35         1       4       47.06         1       1       43.59         1       2       46.03         1       3       47.22         1       4       51.41         1       1       55.39         1       2       49.16         1       3       58.26         1       4       48.12         1       49.98         1       2       44.84         1       3       55.12         1       4       47.36         1       44.7       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       46.2         1       3       51.52	2	3	56.39	
1       2       51.73         1       3       51.35         1       4       41.85         1       1       45.21         1       2       55.02         1       3       45.35         1       4       47.06         1       1       43.59         1       2       46.03         1       3       47.22         1       4       51.41         1       1       55.39         1       2       49.16         1       3       58.26         1       4       48.12         1       49.98         1       44.84         1       3       55.12         1       44.736         1       44.7         1       43.44         1       3       52.36         1       44.59         1       46.2         1       3       51.52	2	4	58.33	
1       3       51.35         1       4       41.85         1       1       45.21         1       2       55.02         1       3       45.35         1       4       47.06         1       1       43.59         1       2       46.03         1       3       47.22         1       4       51.41         1       1       55.39         1       2       49.16         1       3       58.26         1       4       48.12         1       49.98         1       44.84         1       3       55.12         1       44.7.36         1       44.7         1       43.44         1       3       52.36         1       45.9         1       46.2         1       3       51.52	1	1	51.26	
1       4       41.85         1       1       45.21         1       2       55.02         1       3       45.35         1       4       47.06         1       1       43.59         1       2       46.03         1       3       47.22         1       4       51.41         1       1       55.39         1       2       49.16         1       3       58.26         1       4       48.12         1       49.98         1       2       44.84         1       3       55.12         1       4       47.36         1       44.7       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       46.2         1       3       51.52	1	2	51.73	
1       1       45.21         1       2       55.02         1       3       45.35         1       4       47.06         1       1       43.59         1       2       46.03         1       3       47.22         1       4       51.41         1       1       55.39         1       2       49.16         1       3       58.26         1       4       48.12         1       4       49.98         1       4       44.84         1       3       55.12         1       4       47.36         1       47.36       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       1       43.61         1       2       46.2         1       3       51.52	1	3	51.35	
1       2       55.02         1       3       45.35         1       4       47.06         1       1       43.59         1       2       46.03         1       3       47.22         1       4       51.41         1       1       55.39         1       2       49.16         1       3       58.26         1       4       48.12         1       1       49.98         1       2       44.84         1       3       55.12         1       4       47.36         1       4       47.36         1       43.44         1       3       52.36         1       4       45.9         1       4       45.9         1       1       43.61         1       2       46.2         1       3       51.52	1	4	41.85	
1       3       45.35         1       4       47.06         1       1       43.59         1       2       46.03         1       3       47.22         1       4       51.41         1       1       55.39         1       2       49.16         1       3       58.26         1       4       48.12         1       1       49.98         1       2       44.84         1       3       55.12         1       4       47.36         1       1       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       1       43.61         1       2       46.2         1       3       51.52	1	1	45.21	
1       4       47.06         1       1       43.59         1       2       46.03         1       3       47.22         1       4       51.41         1       1       55.39         1       2       49.16         1       3       58.26         1       4       48.12         1       1       49.98         1       2       44.84         1       3       55.12         1       4       47.36         1       44.7       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       46.2         1       3       51.52	1	2	55.02	
1       1       43.59         1       2       46.03         1       3       47.22         1       4       51.41         1       1       55.39         1       2       49.16         1       3       58.26         1       4       48.12         1       1       49.98         1       2       44.84         1       3       55.12         1       4       47.36         1       44.7       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       43.61         1       2       46.2         1       3       51.52	1	3	45.35	
1       2       46.03         1       3       47.22         1       4       51.41         1       1       55.39         1       2       49.16         1       3       58.26         1       4       48.12         1       1       49.98         1       2       44.84         1       3       55.12         1       4       47.36         1       44.7       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       4       45.9         1       4       46.2         1       3       51.52	1	4	47.06	
1       3       47.22         1       4       51.41         1       1       55.39         1       2       49.16         1       3       58.26         1       4       48.12         1       1       49.98         1       2       44.84         1       3       55.12         1       4       47.36         1       1       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       4       45.9         1       4       46.2         1       3       51.52	1	1	43.59	
1       4       51.41         1       1       55.39         1       2       49.16         1       3       58.26         1       4       48.12         1       1       49.98         1       2       44.84         1       3       55.12         1       4       47.36         1       1       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       4       43.61         1       2       46.2         1       3       51.52	1	2	46.03	
1       1       55.39         1       2       49.16         1       3       58.26         1       4       48.12         1       1       49.98         1       2       44.84         1       3       55.12         1       4       47.36         1       1       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       4       43.61         1       2       46.2         1       3       51.52	1	3	47.22	
1       2       49.16         1       3       58.26         1       4       48.12         1       1       49.98         1       2       44.84         1       3       55.12         1       4       47.36         1       1       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       4       43.61         1       2       46.2         1       3       51.52	1	4	51.41	
1       3       58.26         1       4       48.12         1       1       49.98         1       2       44.84         1       3       55.12         1       4       47.36         1       1       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       1       43.61         1       2       46.2         1       3       51.52	1	1	55.39	
1       4       48.12         1       1       49.98         1       2       44.84         1       3       55.12         1       4       47.36         1       1       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       1       43.61         1       2       46.2         1       3       51.52	1	2	49.16	
1     1     49.98       1     2     44.84       1     3     55.12       1     4     47.36       1     1     44.7       1     2     43.44       1     3     52.36       1     4     45.9       1     1     43.61       1     2     46.2       1     3     51.52	1	3	58.26	
1     2     44.84       1     3     55.12       1     4     47.36       1     1     44.7       1     2     43.44       1     3     52.36       1     4     45.9       1     1     43.61       1     2     46.2       1     3     51.52	1	4	48.12	
1       3       55.12         1       4       47.36         1       1       44.7         1       2       43.44         1       3       52.36         1       4       45.9         1       1       43.61         1       2       46.2         1       3       51.52	1	1	49.98	
1     4     47.36       1     1     44.7       1     2     43.44       1     3     52.36       1     4     45.9       1     1     43.61       1     2     46.2       1     3     51.52	1	2	44.84	
1     1     44.7       1     2     43.44       1     3     52.36       1     4     45.9       1     1     43.61       1     2     46.2       1     3     51.52	1	3	55.12	
1 2 43.44 1 3 52.36 1 4 45.9 1 1 43.61 1 2 46.2 1 3 51.52	1	4	47.36	
1 3 52.36 1 4 45.9 1 1 43.61 1 2 46.2 1 3 51.52	1	1	44.7	
1 4 45.9 1 1 43.61 1 2 46.2 1 3 51.52	1	2	43.44	
1 1 43.61 1 2 46.2 1 3 51.52	1	3	52.36	
1 2 46.2 1 3 51.52	1	4	45.9	
1 3 51.52	1	1	43.61	
	1	2	46.2	
	1	3	51.52	
	1	4		
2 1 53.5	2	1	53.5	

2	2	56.34	
2	3	51.83	
2	4	50.2	
1	1	50.2	
1	2	45.75	
1	3	44.29	
1	4	49.41	