ISA 225 Final Exam Formulas

Support = $\frac{transactions\ with\ \ every\ item\ in\ A\ \&\ B}{all\ transactions}$

Confidence = $\frac{transactions\ with\ every\ item\ in\ A\ \&\ B}{transactions\ with\ the\ items\ in\ A}$

Lift = $\frac{Confidence}{Benchmark\ confidence}$

Benchmark Conf = $\frac{transactions\ with\ every\ item\ in\ B}{all\ transactions}$

$\left[\hat{p}\ \pm\ Z\alpha_{/2}\mathrm{SE}(\hat{p})\ \right]$

$\mathrm{SE}(\hat{p}) = \sqrt{\frac{\hat{p}\hat{q}}{n}}$

$z_{calc} = \frac{\hat{p}-p}{\sqrt{\frac{p\,q}{n}}}$

$SD(\bar{y}) = \sigma_{\bar{y}} = \frac{\sigma}{\sqrt{n}}$

$SE(\bar{y}) = \frac{s}{\sqrt{n}}$

$\left[\bar{y}\ \pm\ Z\alpha_{/2}SD(\bar{y})\right]$

$\left[\bar{y}\ \pm t_{\alpha/2}^{n-1}\ SE(\bar{y})\right]$

$t_{calc} = \frac{\bar{y}-\mu_{\bar{y}}}{SE(\bar{y})}$

$t = \frac{(\bar{y}_1-\bar{y}_2)-\Delta}{SE(\bar{y}_1-\bar{y}_2)}$

$SE(\bar{y}_1-\bar{y}_2) = \sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}}$

$\left[(\bar{y}_1-\bar{y}_2)\pm t_{\alpha/2}^{df}SE(\bar{y}_1-\bar{y}_2)\right]$ df=min(n_1-1, n_2-1)

$\left[(\hat{p}_1-\hat{p}_2)\pm Z\alpha_{/2}\,SE(\hat{p}_1-\hat{p}_2)\right]$

$SE(\hat{p}_1-\hat{p}_2) = \sqrt{\frac{\hat{p}_1\hat{q}_1}{n_1}+\frac{\hat{p}_2\hat{q}_2}{n_2}}$

$\chi^2 = \Sigma\frac{(Obs-Exp)^2}{Exp}$

Exp = (Model%)(n)

df = #cells – 1

$Exp = \frac{(RowTotal)(ColumnTotal)}{n}$

df = (#rows-1)(#columns-1)

$e_i = y_i - \hat{y}_i$

SSE = $\sum e_i^2 = \sum(y_i-\hat{y}_i)^2$

$MSE = s_e^2 = \frac{SSE}{n-k-1}$

$s_e = \sqrt{MSE}$

$R^2 = \frac{SSR}{SST}$

SST = SSR + SSE

$\left[b_j \pm t_{\alpha/2}^{n-k-1}SE(b_j)\right]$

$t_{calc} = \frac{b_j}{SE(b_j)}$

$$\left[\hat{y} \pm t_{\propto/2}^{n-k-1} \cdot SE(\hat{\mu})\right] \rightarrow$$

$$\text{SE}(\hat{\mu}) = \sqrt{SE(b_1)^2 \cdot (x_0 - \bar{x})^2 + \frac{s_e^2}{n}}$$

$$\left[\hat{y} \pm t_{\propto/2}^{n-k-1} \cdot SE(\hat{y})\right] \rightarrow$$

$$SE(\hat{y}) = \sqrt{SE(b_1)^2 \cdot (x_0 - \bar{x})^2 + \frac{s_e^2}{n} + s_e^2}$$

$$F_{model} = \frac{SSR/_k}{SSE/_{n-k-1}} = \frac{MSR}{MSE}$$

$$\tilde{y}_t = \frac{\sum_{i=t-L+1}^{t} y_i}{L}$$

$$\hat{y}_{t+1} = \tilde{y}_t$$

$$\tilde{y}_t = \alpha y_t + (1-\alpha)\tilde{y}_{t-1}$$

$$e_t = y_t - \hat{y}_t$$

$$MSE = \frac{1}{n}\sum (y_t - \hat{y}_t)^2$$

$$MAD = \frac{1}{n}\sum \left|y_t - \hat{y}_t\right|$$

$$MAPE = 100 \times \frac{1}{n}\sum \frac{\left|y_t - \hat{y}_t\right|}{\left|y_t\right|}$$

df	$t_{.10}$	$t_{.05}$	$t_{.025}$	$t_{.01}$	$t_{.005}$	$t_{.001}$	$t_{.0005}$
1	3.078	6.314	12.706	31.821	63.657	318.310	636.620
2	1.886	2.920	4.303	6.965	9.925	22.326	31.598
3	1.638	2.353	3.182	4.541	5.841	10.213	12.924
4	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	1.319	1.714	2.069	2.500	2.807	3.485	3.767
24	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	1.316	1.708	2.060	2.485	2.787	3.450	3.725
26	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	1.314	1.703	2.052	2.473	2.771	3.421	3.690
28	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	1.311	1.699	2.045	2.462	2.756	3.396	3.659
30	1.310	1.697	2.042	2.457	2.750	3.385	3.646
31	1.309	1.696	2.040	2.453	2.744	3.375	3.633
32	1.309	1.694	2.037	2.449	2.738	3.365	3.622
33	1.308	1.692	2.035	2.445	2.733	3.356	3.611
34	1.307	1.691	2.032	2.441	2.728	3.348	3.601
35	1.306	1.690	2.030	2.438	2.724	3.340	3.591
36	1.306	1.688	2.028	2.434	2.719	3.333	3.582
37	1.305	1.687	2.026	2.431	2.715	3.326	3.574
38	1.304	1.686	2.024	2.429	2.712	3.319	3.566
39	1.304	1.685	2.023	2.426	2.708	3.313	3.558
40	1.303	1.684	2.021	2.423	2.704	3.307	3.551
41	1.303	1.683	2.020	2.421	2.701	3.301	3.544
42	1.302	1.682	2.018	2.418	2.698	3.296	3.538
43	1.302	1.681	2.017	2.416	2.695	3.291	3.532
44	1.301	1.680	2.015	2.414	2.692	3.286	3.526
45	1.301	1.679	2.014	2.412	2.690	3.281	3.520
46	1.300	1.679	2.013	2.410	2.687	3.277	3.515
47	1.300	1.678	2.012	2.408	2.685	3.273	3.510
48	1.299	1.677	2.011	2.407	2.682	3.269	3.505
50	1.299	1.676	2.009	2.403	2.678	3.261	3.496
51	1.298	1.675	2.008	2.402	2.676	3.258	3.492
52	1.298	1.675	2.007	2.400	2.674	3.255	3.488
53	1.298	1.674	2.006	2.399	2.672	3.251	3.484
54	1.297	1.674	2.005	2.397	2.670	3.248	3.480
55	1.297	1.673	2.004	2.396	2.668	3.245	3.476
56	1.297	1.673	2.003	2.395	2.667	3.242	3.473
57	1.297	1.672	2.002	2.394	2.665	3.239	3.470
58	1.296	1.672	2.002	2.392	2.663	3.237	3.466
59	1.296	1.671	2.001	2.391	2.662	3.234	3.463
60	1.296	1.671	2.000	2.390	2.660	3.232	3.460
61	1.296	1.670	2.000	2.389	2.659	3.229	3.457
62	1.295	1.670	1.999	2.388	2.657	3.227	3.454
63	1.295	1.669	1.998	2.387	2.656	3.225	3.452
64	1.295	1.669	1.998	2.386	2.655	3.223	3.449
65	1.295	1.669	1.997	2.385	2.654	3.220	3.447
66	1.295	1.668	1.997	2.384	2.652	3.218	3.444
67	1.294	1.668	1.996	2.383	2.651	3.216	3.442
68	1.294	1.668	1.995	2.382	2.650	3.214	3.439
69	1.294	1.667	1.995	2.382	2.649	3.213	3.437
70	1.294	1.667	1.994	2.381	2.648	3.211	3.435
71	1.294	1.667	1.994	2.380	2.647	3.209	3.433
72	1.293	1.666	1.993	2.379	2.646	3.207	3.431
73	1.293	1.666	1.993	2.379	2.645	3.206	3.429
74	1.293	1.666	1.993	2.378	2.644	3.204	3.427
75	1.293	1.665	1.992	2.377	2.643	3.202	3.425
76	1.293	1.665	1.992	2.376	2.642	3.201	3.423
77	1.293	1.665	1.991	2.376	2.641	3.199	3.421
78	1.292	1.665	1.991	2.375	2.640	3.198	3.420
79	1.292	1.664	1.990	2.374	2.640	3.197	3.418
80	1.292	1.664	1.990	2.374	2.639	3.195	3.416
81	1.292	1.664	1.990	2.373	2.638	3.194	3.415
82	1.292	1.664	1.989	2.373	2.637	3.183	3.413
83	1.292	1.663	1.989	2.372	2.636	3.191	3.412
84	1.292	1.663	1.989	2.372	2.636	3.190	3.410
85	1.292	1.663	1.988	2.371	2.635	3.189	3.409
86	1.291	1.663	1.988	2.370	2.634	3.188	3.407
87	1.291	1.663	1.988	2.370	2.634	3.187	3.406
88	1.291	1.662	1.987	2.369	2.633	3.185	3.405
89	1.291	1.662	1.987	2.369	2.632	3.184	3.403
90	1.291	1.662	1.987	2.368	2.632	3.183	3.402
95	1.291	1.661	1.985	2.366	2.629	3.178	3.396
99	1.290	1.660	1.984	2.365	2.626	3.175	3.392
100	1.290	1.660	1.984	2.364	2.626	3.174	3.390
120	1.289	1.658	1.980	2.358	2.617	3.160	3.373
∞	1.282	1.645	1.960	2.326	2.576	3.090	3.291