

MATH 3308:

Stats Group Project



GROUP PRESENTATION

Sheridan Ingram

WORK: SLIDES 3-4

Graham Kroll

WORK

Breanna Lipscomb

PRESENTATION



Project

Usual yield = 70 new proc. claims to produce better yield 90% of the time

P = Prob. of an increased yield tested 65 times

X = # of trials where the yield exceeds 70

$$n = 65$$

$$P = .9$$

$$q = .1$$

a) $nq = 6.5$ so yes, normal approx. is appropriate

$$\begin{aligned} b) \quad nq > 5 \text{ if } P > .5 & \quad np > 5 \text{ if } P \leq .5 \\ 65(1-P) > 5 & \quad 65P > 5 \\ 65 - 65P > 5 & \quad P > .0769 \\ -65P > -60 & \\ P < .923 & \end{aligned}$$

c) accept if $X \geq 62$, what is Prob. we accept given $P = .9$
 $P[X \geq 62] = 1 - P[X \leq 61] = 1 - \text{binomcdf}(n, p, x)$
 $= .09955 \rightarrow 9.955\%$

d) accept if $X \geq 62$, what if $p = .85$
 $P[X \geq 62] = 1 - P[X \leq 61] = 1 - \text{binomcdf}(n, p, x)$
 $= .0082 \rightarrow .82\%$

e) what if $P = .95$
 $P[X \geq 62] = 1 - P[X \leq 61] = .59 \rightarrow 59\%$

f) What is the probability that we fail to accept the claim as true ($P[X \leq 61]$) even though p is actually .95 ^{fail to accept truth}
 $P[X \leq 61] = \text{binomcdf}(n, p, x)$
 $= .91 \rightarrow 91\%$

g) What is the probability that we accept the claim as true ^{believe lie} but it is actually false and $p = .85$
 $P[X \geq 62] = 1 - P[X \leq 61]$
 $= 1 - \text{binomcdf}(n, p, x)$
 $= .0082 \rightarrow .82\%$

h) after multiple tests with different trials and p -values, $n = 58$ is the best value

A	B	C	D	E	F	G	H	I	J	K	L	M	N
trials	fail to accept truth	believe a lie	sum		trials	fail to accept truth	believe a lie	sum		trials	fail to accept truth	believe a lie	sum
55	0.001396842674	0.4817370373	0.48313388		55	0.06458470727	0.8888319119	0.9534166192		55	0.01454982826	0.7508133052	0.7653631334
56	0.004928271178	0.3446552828	0.3495835539		56	0.1275641825	0.8012773032	0.9288414858		56	0.03671269638	0.6224741022	0.6591867986
57	0.01552255669	0.2220031866	0.2375257433		57	0.2281103624	0.6768575961	0.9049679584		57	0.08320472799	0.4738708146	0.5570755426
58	0.04328689114	0.1261371804	0.1694240715		58	0.368335686	0.5224055458	0.8907412318		58	0.1684019485	0.3235594432	0.4919613916
59	0.1058742891	0.06168489372	0.1675591829		59	0.5365532587	0.3574821701	0.8940354288		59	0.3026958723	0.1927800579	0.4954759302
60	0.2247903453	0.02516193128	0.2499522766		60	0.7066399156	0.209051132	0.9156910476		60	0.4811149425	0.09687517533	0.5779901179
61	0.409987482	0.008197713749	0.4181851958		61	0.8476042669	0.09955282519	0.9471570921		61	0.6754120565	0.03922743173	0.7146394882
62	0.637003327	0.001995741749	0.6389990687		62	0.9395595068	0.03597316317	0.97553267		62	0.8419524399	0.01195323045	0.8539056703
63	0.8423986153	0.0003221937495	0.8427208091		63	0.983834252	0.008724736588	0.9925589886		63	0.9473147232	0.002428906196	0.9497436294
64	0.9643520677	0.00002583629124	0.964377904		64	0.9978238416	0.001061116612	0.9988849582		64	0.9910588855	0.0002462485545	0.9913051341
65	1	0	1		65	1	0	1		65	1	0	1
	fail to accept truth p-value	believe a lie p-value				fail to accept truth p-value	believe a lie p-value				fail to accept truth p-value	believe a lie p-value	
	0.95	0.85				0.91	0.9				0.93	0.88	

[Sheridan's Excel]

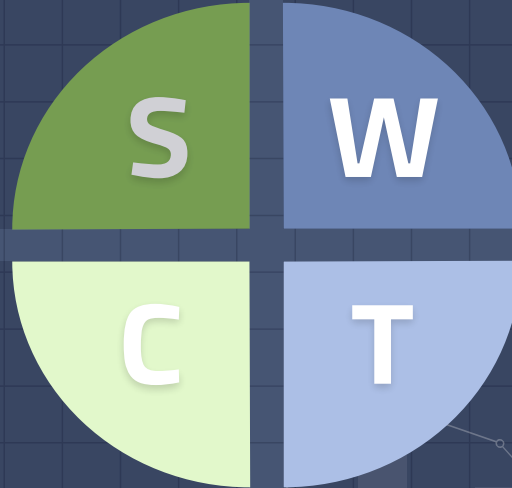
GROUP ANALYSIS

STRENGTHS

Scheduled time to meet in person;
Communicated by email and text;
Asked questions.

Worked well together;
Very descriptive with explanations.

COLLABORATION



WEAKNESSES

Not initially understanding every
part of the project;

Excel;
Google Slides;
Calculators.

TECHNOLOGY