Ch9 Homework

1. Set up H_0 and H_1 to test the claim that more than 40% of adults are single.

H0: P=0.4 H1: P>0.4 H1 is claim

2. Set up H_0 and H_1 to test the claim that 67% of college students are full-time students.

H0: P=0.67 H1: P!=0.67 H0 is claim

3. Set up H_0 and H_1 to test the claim that the mean age of college students is less than 30.

H0: u=30 H1: u<30 H1 is claim

4. Set up H_0 and H_1 to test the claim that the mean speed limit of Bay Area drivers on US freeways is more than 70 mph.

H0: u=70 H1: u>70 H1 is claim

5. Set up H_0 and H_1 to test the claim that the mean GPA of college student is 3.0.

H0: u=3.0 H1: u!=3.0 H0 is claim

6. Suppose the null hypothesis is the used car is safe to drive long distance. Identify Type I and Type II errors. Which error is more serious?

Type I errors:The used car is safe to drive long distance, but we think it's unsafe

Type II errors: The used car is unsafe to drive long distance but we think it's safe

Type II errors is more serious

7. A newspaper claims that at least 40% of drivers do not fully stop at stop signs. Identify Type I and Type II errors. Which error is more serious?

Type I errors: At least 40% don't fully stop at stop signs, but we think it's less than 40% do not fully stop

Type II errors: Less than 40% don't fully stop at stop signs, but we think it's more than 40% do not fully stop

Type I errors is more serious

8. A simple random sample of 200 recent STEM graduates reveals a mean salary of $120,769 and a standard deviation of $15,245. Test the claim that the mean salary of recent STEM graduates is more than $100,000. H0: u=100000 H1: u>100000

One sample T summary hypothesis test:
μ : Mean of population
H_0 : μ = 100000
H_A : μ > 100000

Hypothesis test results:

Mean	Sample Mean	Std. Err.	DF	T-Stat	P-value
μ	120769	1077.9843	199	19.266515	<0.0001

P<<0.05 we reject H0 Mean salary exceeds 100000

9. A simple random sample of 200 Bay Area criminals reveals that their mean age is 21 with a standard deviation of 2. Test the claim that the mean age of Bay Area criminals is less than 25. H0: u=25 H1: u<25

Hypothesis test results:

Mean	Sample Mean	Std. Err.	DF	T-Stat	P-value
μ	21	0.14142136	199	-28.284271	<0.0001

P<<0.05 we reject H0 Mean age less than 25

10. The GPAs of 33 random CA community college students who transferred to UC.
3.3, 3.3, 3.4, 3.4, 3.4, 3.5, 3.5, 3.5, 3.5, 3.5, 3.5, 3.6, 3.6, 3.6, 3.6, 3.6, 3.7, 3.7, 3.7, 3.7, 3.8, 3.8, 3.8, 3.8, 3.8, 3.8, 3.9, 3.9, 3.9, 3.9, 4.0, 4.0, 4.0
Use the data to test the claim that mean GPA of CA community college students who transferred to UC is more than 3.5. H0: u=3.5 H1: u>25

Hypothesis test results:

Variable	Sample Mean	Std. Err.	DF	T-Stat	P-value
var1	3.66875	0.036598712	31	4.610818	<0.0001

P<<0.05 we reject H0 Mean GPA more than 3.5

11. In a simple random sample of 120 community college students, 20 community college students said that they like math. Test the claim that less than 20% of community college students like math. H0: P=0.2 H1: P<0.2

Hypothesis test results:

Proportion	Count	Total	Sample Prop.	Std. Err.	Z-Stat	P-value
p	20	120	0.16666667	0.036514837	-0.91287093	0.1807

P>0.5 we fail to reject H0 No enough evidance at 96% CI that less than 20% stduents like math

12. A student tests the claim that more than 30% of Bay Area residents dislike morning traffic. The student creates a survey and collect data from 33 randomly chosen Bay Area residents. The data from the survey is listed below.
y,n,n,n,n,n,y,y,y,y,y,y,n,n,n,n,n,y,y,n,n,n,y,y,y,y,n,n,n,n,n.
Use the sample data to test the claim. H0: P=0.3 H1: P>0.3

P<0.5 we reject H0 more than 30% of Bay Area residents dislike morning traffic.

Hypothesis test results:

Variable	Count	Total	Sample Prop.	Std. Err.	Z-Stat	P-value
var2	15	33	0.45454545	0.079772404	1.9373298	0.0264