1A..

One tailed z test

1B.

> p <- 0.07

> n <- 209

> x <- 23

> XN <- x/n

>

> z <- (XN - p) / sqrt(p\*(1-p)/n)

> pval <- 1 - pnorm(z)

>

> pval

[1] 0.01162982

1C.

since the p-value is less than the significance level of .05, we can reject the null hypothesis. And we conclude that the proportion of low birth weight babies in Sudan is greater than .07.

1D.

since the p-value is still less than the significance level of .01, we reject the null hypothesis. And we conclude that the proportion of low birth weight babies in Sudan is greater than .07.

2A.

chi-squared goodness-of-fit test

2B.

| ob <- c(341, 467, 421, 376, 395)  > exp <- rep(sum(ob)/5, 5)  >  > chisq <- sum((ob - exp)^2 / exp)  > pval <- 1 - pchisq(chisq, df = 4)  >  > pval  [1] 0.0001571593  > |
| --- |
|  |
| | > | | --- | |

2C.

since the p-value is less than the 0.05, we reject the null hypothesis. We can conclude that the proportion of colors in the jar of M&Ms is not uniform.

2D.

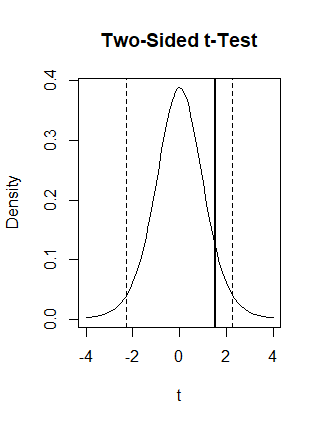
Since the p-value is still less than the 0.01 we reject the null hypothesis. We can conclude that the proportion of colors in the jar of M&Ms is not uniform.

3A.

Two side t-test

Statistic is t = (x̄ - μ) / (s / √n) // t <- (x\_bar - mu) / (s / sqrt(n))

3B.

I don’t really know how to do this, not sure what i’m supposed to sketch or make.  
  
I did do this though  
  


3c.

> thicknesses <- c(7.65, 7.6, 7.65, 7.7, 7.55, 7.55, 7.4, 7.4, 7.5, 7.5)

>

> n <- length(thicknesses)

>

> x\_bar <- mean(thicknesses)

> s <- sd(thicknesses)

>

> mu <- 7.5

>

> t <- (x\_bar - mu) / (s / sqrt(n))

>

> p\_value <- 2 \* pt(-abs(t), df = n - 1)

>

> p\_value

[1] 0.1581954

3D.

The p-value is 0.15 which is greater than the 0.05 significance level. Thus, fail to reject the null hypothesis and can conclude that there is not enough evidence to suggest that the mean thickness of the spearmint gum strips is different from the target thickness.

4A.

One side t test

t = (x̄ - μ) / (s / sqrt(n))

where xx is the sample mean, μ is the hypothesized mean, s is the sample standard deviation, and n is the sample size.

Where x is the sample mean, μ is the hypothesized mean (47 mg), s is the sample standard deviation, and n is the sample size. The critical region is given by the t-value that corresponds to a significance level of 0.05 with (n-1) degrees of freedom

4B.

P-value is 0.0896, which is larger than the significance level of 0.05. Therefore, we fail to reject the null hypothesis and can conclude that there is not enough evidence to suggest that the mean amount of Vitamin B6 in each pill is less than 47 mg.

5. Skipping this one as i don’t know how to do it  
  
6.

6A..

auto = load('C:\Users\Tetra\Downloads\Be\auto.csv')

| model1 <- lm(mpg ~ weight, data = auto)  > summary(model1)  Call:  lm(formula = mpg ~ weight, data = auto)  Residuals:  Min 1Q Median 3Q Max  -12.0123 -2.8076 -0.3541 2.1145 16.4802  Coefficients:  Estimate Std. Error t value Pr(>|t|)  (Intercept) 46.3173992 0.7962915 58.17 <2e-16 \*\*\*  weight -0.0076766 0.0002578 -29.78 <2e-16 \*\*\*  ---  Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1  Residual standard error: 4.35 on 395 degrees of freedom  Multiple R-squared: 0.6918, Adjusted R-squared: 0.691  F-statistic: 886.6 on 1 and 395 DF, p-value: < 2.2e-16 |
| --- |
|  |
| | > | | --- | |

6B.

> modeltwo <- lm(mpg ~ weight + cylinders, data = auto)

> summary(modeltwo)

Call:

lm(formula = mpg ~ weight + cylinders, data = auto)

Residuals:

Min 1Q Median 3Q Max

-12.677 -2.840 -0.297 2.256 16.544

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 46.3966522 0.7919053 58.59 <2e-16 \*\*\*

weight -0.0063978 0.0005796 -11.04 <2e-16 \*\*\*

cylinders -0.7104007 0.2888186 -2.46 0.0143 \*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 4.323 on 394 degrees of freedom

Multiple R-squared: 0.6965, Adjusted R-squared: 0.6949

F-statistic: 452 on 2 and 394 DF, p-value: < 2.2e-16

6C.

model1 <- lm(mpg ~ weight + cylinders, data = auto)

>

> summary(model1)$r.squared

[1] 0.6964507

>

>

> modeltwo <- lm(mpg ~ weight + cylinders + horsepower, data = auto)

>

> summary(modeltwo)$r.squared

[1] 0.8289737

>