Testcase 1-

[1] "The two-proportion test could not be run because the value of CSK was not equal to K, meaning our data is not a count of successes and failures"

[1] "The F test could not be run because the CSK value is not 'S', meaning our data is not spread"

[1] "We cannot perform the pooled two-sample t test or the two-sample t test because our data is not independent"

[1] "Since our data is paired, Depended and our signTNormal, which was generated from the shapiro test is greater than 0.05 we can use the paired t test"

[1] "Fail to reject Ho: p=0.0338180005474067"

Testcase 1 explanation-

In testcase 1, we are looking at data that has the Details, ‘C’ and ‘D’. This means that the data we are looking at is “Center” and “Dependent” and we also can note that we have an equal amount of x and y values. Since we do not have a detail value of ‘K’ or ‘D’ we know we cannot use the Two Proportion test or the F test. In our code we eliminate these tests right away because we know we can no longer do them. We can also eliminate the pooled two-sample t test and the two-sample t test because our data is not ‘I’, independent, but rather ‘D’ dependent. And then we narrow the type of test down even further by looking at the normality, confirming we should use the paired t test. After we conduct the test and calculate the p value we discover p=0.033, which is greater than 0.025, so we fail to reject Ho.

Testcase 2-

[1] "The two-proportion test could not be run because the value of CSK was not equal to K, meaning our data is not a count of successes and failures"

[1] "The F test could not be run because the CSK value is not 'S', meaning our data is not spread"

[1] "We cannot perform the pooled two sample t test because our variance is not approximately equal"

[1] "We can perform the two-sample t test because even though our variance is not approximately equal, our data is approximately normal"

[1] "Fail to reject Ho: p=0.0353113865351224"

Testcase 2 explanation-

Again, we always want to start out as broad as possible meaning looking at our details. We have the details of ‘C’ and ‘I’ meaning our data is Center and Independent. Looking at the first detail, ‘C’ again we can knock out the Two-proportion test as well as the F test because those tests require the data to be “Spread” or “Counts”. So next, in our code we enter the section that is If our CSK = ‘C’ and now we must look at our DI, which is ‘I’ stating our data is independent. Since our data meets the requirements CSK = ‘C’ and DI = ‘I’, our program is in between the pooled two-sample t test and the two-sample t test. We then decide between these two by looking at the equality of our variances. We note that our variance is not approximately equal, so we cannot use the pooled two sample t test. So, we move on to the two-sample t test, noting that our data is approximately normal we decide this is the best test for us to use. We co our calculations and discover our p value is approximately 0.035, so we fail to reject the null hypothesis of equality.

Testcase 3-

[1] "We can use the two-proportion test because our CSK value is equal to K, meaning our data is a count of successes and failures, and our count of x values and y values are both greater than 10"

[1] "Fail to reject Ho: p=0.025542647238727 7"

[1] "The F test could not be run because the CSK value is not 'S', meaning our data is not spread"

[1] "None of the tests, pooled two sample test, two sample t test, paired t or sign test could be run because CSK was not equal to C"

Testcase 3 explanation-

In this case our Details values are CSK = ‘K’ and DI = ‘I’ which makes deciding our test a little bit easier. We only have one test to choose from when our CSK value is ‘K’, the two-proportion test. However, since our CSK value is ‘K’ it does not mean we can automatically use this test, we also must make sure that our number of x values and y values are greater than 10, luckily in this case they are so we can proceed with the test. After doing our calculations it is found out that our p value is approximately 0.0255, just narrowly having us fail to reject the null hypothesis.

Testcase 4-

[1] "We can use the two-proportion test because our CSK value is equal to K, meaning our data is a count of successes and failures, and our count of x values and y values are both greater than 10"

[1] "Reject Ho: p=6.1366136494519e-16"

[1] "The F test could not be run because the CSK value is not 'S', meaning our data is not spread"

[1] "None of the tests, pooled two sample test, two sample t test, paired t or sign test could be run because CSK was not equal to C"

Testcase 4 explanation-

Again, in this case our Details values are CSK = 'K' and DI = 'I' which makes deciding our test a little bit easier. We only have one test to choose from when our CSK value is 'K', the two-proportion test. However, since our CSK value is 'K' it does not mean we can automatically use this test, we also must make sure that our number of x values and y values are greater than 10, also in this case they are so we can proceed with the test. After doing our calculations it is found out that our p value is very small, 6.13 *10^-16 which is certainly less than 0.025 so in this case we reject the null hypothesis, accepting the alternative.

Testcase 5-

[1] "The two-proportion test could not be run because the value of CSK was not equal to K, meaning our data is not a count of successes and failures"

[1] "The F test could not be run because the x and y values are not normal"

[1] "None of the tests, pooled two sample test, two sample t test, paired t or sign test could be run because CSK was not equal to C"

Testcase 5 explanation –

Testcase 5 is an example of data that we do not have a test for. However, we can still describe why we do not have a successful test for this. Our Details are CSK = 'S' and DI = 'I', so as described earlier we know we cannot use the two-proportion test, because our values are not counts of successes and failures. We also can not use any of the tests for when our CSK value is 'C', The Pooled two-sample t test, the two-sample t test, the paired t test and the sign test. So, we are left with the F test. However, one of our conditions for the F test is that our x and y values should be approximately normal, which unfortunately they are not so we do not have any tests for testcase 5.

Testcase 6-

[1] "The two-proportion test could not be run because the value of CSK was not equal to K, meaning our data is not a count of successes and failures"

[1] "We can use the F test since our CSK value is equal to 'S' and our data is approximately normal"

[1] "Fail to reject Ho: p=0.16916152795188"

[1] "None of the tests, pooled two sample test, two sample t test, paired t or sign test could be run because CSK was not equal to C"

Testcase 6 explanation -

Again, our goal is to knock out as many tests as possible until we are left with only one test to choose from. So, the most important indicator of test is in the details, in this case our CSK = 'S' and our DI = 'I', meaning our data is spread and independent. Having a CSK of 'S' gives us only one test to choose from, in this case it is the F test. However, unlike the previous example our data is approximately normal, so we can conduct the test. After doing some calculations we discover our p value is approximately 0.17 which certainly is greater than 0.025, so we fail to reject our null hypothesis.

Testcase 7-

[1] "The two-proportion test could not be run because the value of CSK was not equal to K, meaning our data is not a count of successes and failures"

[1] "The F test could not be run because the CSK value is not 'S', meaning our data is not spread"

[1] "We can perform the pooled two sample t test because we have approximately equal variance and our data is approximately normal"

[1] "Reject Ho: p=9.99661974757338e-09"

Testcase 7 explanation-

Looking first at our details we note that our CSK is equal to "C", meaning that we can not have a two-proportion test, because our value is not "K" and we also cannot have a F test because our value is not "S". We then analyze the DI value of our data. Noting the DI value is "I" we can eliminate the paired t test and the sign test. Which means we are left with the pooled two sample t test as well as the two-sample t test. We then note that our variances are approximately equal so we can use the two sample t test. After conducting our test we note that the p value is very small, only 9.99 * 10^-9 which is significantly smaller than .025 so we reject the null hypothesis.

Testcase 8-

[1] "The two-proportion test could not be run because the value of CSK was not equal to K, meaning our data is not a count of successes and failures"

[1] "The F test could not be run because the CSK value is not 'S', meaning our data is not spread"

[1] "We cannot perform the pooled two-sample t test or the two-sample t test because our data is not independent"

[1] "We cannot use the paired t test because our signTNormal, gathered from the shapiro test, is less than 0.05"

[1] "Since our data is dependent and the size of x and y are equal we can use the Sign test"

[1] SignTest(x1,y1)
p-value = 0.8238

Testcase 8 explanation-

The data skips to conducting a sign test, because the data does not describe a proportion or spread, it is not normal and is not independent. It then uses the difference of x1 and y1 to compute the p value for the null of x1-y1 = 0. The P-value is greater than 0.05, so it fails to reject the null hypothesis.

Testcase 9-

[1] "The two-proportion test could not be run because the value of CSK was not equal to K, meaning our data is not a count of successes and failures"

[1] "The F test could not be run because the CSK value is not 'S', meaning our data is not spread"

[1] "We can perform the pooled two sample t test because we have approximately equal variance and our data is approximately normal"

[1] "Reject Ho: p=1.06343053095174e-09"

Testcase 9 explanation-

Looking first at our details we note that our CSK is equal to “C”, meaning that we can not have a two-proportion test, because our value is not “K” and we also cannot have a F test because our value is not “S”. We then analyze the DI value of our data. Noting the DI value is “I” we can eliminate the paired t test and the sign test. Which means we are left with the pooled two sample t test as well as the

two-sample t test. We then note that our variances are approximately equal so we can use the two sample t test. After conducting our test we note that the p value is very small, only 1.06 * 10^-9 which is significantly smaller than .025 so we reject the null hypothesis.

Testcase 10-

[1] "The two-proportion test could not be run because the value of CSK was not equal to K, meaning our data is not a count of successes and failures"

[1] "The F test could not be run because the CSK value is not 'S', meaning our data is not spread"

[1] "We cannot perform the pooled two-sample t test or the two-sample t test because our data is not independent"

[1] "Since our data is paired, Dependent and our signTNormal, which was generated from the shapiro test is greater than 0.05 we can use the paired t test"

[1] "Reject Ho: p=0.000122458162608136"

Testcase 10 explanation-

In this case our Details values are CSK = ‘C’ and DI = ‘D’ which means that again we can eliminate the two-proportion test and the F test. Because we have a DI = ‘I’ we know that we must choose between the Paired t test and the Sign test. Since our data is paired, dependent and our signTNormal value is greater than 0.05 we are allowed to use the paired t test. Using this, we find our p value to be 0.00012 which means we can reject our null hypothesis.