1.

A)

H0: The mean “H4/j gene” gene expression value in the ALL group is equal to -0.9.

HA: The mean “H4/j gene” gene expression value in the ALL group is greater than -0.9.

One side t test is being used
p-value = 0.01601
95 percent confidence interval:
-0.844439 Inf
Since the p value is smaller than 0.05, we accept HA which is mean is greater than -0.9
B)
H0: There is no difference of gene H4/j expression between ALL and AML

HA: There is difference of gene H4/j expression between ALL and AML

two side t test is being used
p-value = 0.1444
95 percent confidence interval:
-0.48627436 0.07463315
P is great than 0.05 so we accept H0 which is there is no difference of gene H4/j expression between ALL and AML
C)
H0: the mean expression value for the “H4/j gene” gene equals the mean expression value for the “APS Prostate specific antigen” gene.
HA: the mean expression value for the “H4/j gene” gene is lower than the

mean expression value for the “APS Prostate specific antigen” gene.

Paired t-test is being used
p-value = 0.03886
95 percent confidence interval:
-Inf -0.02175309

The p value is smaller than 0.05 so that we reject H0 and accept HA that the mean expression value for the “H4/j gene” gene is lower than the mean expression value for the “APS Prostate specific antigen” gene.

D)

H0: plow group in the ALL group is equal to 50%

HA: Plow group in the ALL group is greater than 50%

One side exact binomial test is being used
p-value = 0.1239
95 percent confidence interval:
0.4533598 1.0000000

The p value is greater than 0.05 so we accept H0 that Plow group in the ALL group is equal to 50%

E)

H0: pH4j in the ALL group is equal to 0.5.

HA: pH4j in the ALL group is less than 0.5.

One side exact binomial test is being used

p-value = 0.1239

95 percent confidence interval:

0.0000000 0.5466402

The p value is greater than 0.05, we accept H0 that pH4j in the ALL group is equal to 0.5.

F)

H0: The proportion pH4j in the ALL group are the same as the proportion pH4j in the AML group.

HA: The proportion pH4j in the ALL group are different from the proportion pH4j in the AML group.

Two side exact binomial test is being used

p-value = 0.101

95 percent confidence interval:

-0.74094690 0.02714219

The p value is greater than 0.05 so that we could not reject H0 which is The proportion pH4j in the ALL group are the same as the proportion pH4j in the AML group.

2.

A) The expect of result is 2000*0.05 = 100

B)

Exact binomial test

p = 0.165

3.

a) This is the normal a=0.1 type one error rate 95% CI

0.091102 0.096900 0.102698

This is our new practice type one error rate 95% CI

0.09460706 0.10050000 0.10639294

No it is not valid

b)

It looks almost the same. It should be because anyway we just defined 10% of the sample mean would not contains the true mean. However, this is now

valid because in the new practice the mean we have defined to be not valid is actually the good ones. We should not use this practice.

4)

A)

FDR: 695

BON: 103

B) We are going to find the smallest P value which means there is the highest possibility that they are different.
FDR:
[1,] "8.48474310104505e-09" "Zyxin"
[2,] "2.34441673857752e-06" "FAH Fumarylacetoacetate"
[3,] "8.56688138709037e-06" "APLP2 Amyloid beta (A4) precursor-like protein 2"
BON:
[1,] "8.48474310104505e-09" "Zyxin"
[2,] "4.68883347715505e-06" "FAH Fumarylacetoacetate"
[3,] "2.57006441612711e-05" "APLP2 Amyloid beta (A4) precursor-like protein 2"

5)
a) Included in .r file
b)
Wald.sim:
0.9146
Wilson.sim:
0.9332
Agresti.sim

0.9524