1.

```
> t.test(survey$Age, mu=19, alternative = "greater")

        One Sample t-test

data:  survey$Age
t = 3.2683, df = 236, p-value = 0.0006215
alternative hypothesis: true mean is greater than 19
95 percent confidence interval:
 19.68004      Inf
sample estimates:
mean of x
 20.37451
```

Null hypothesis: True mean is less than 19

Alternative hypothesis: True mean is greater than 19

p-value is significantly less than the alpha, there is enough evidence to reject the null hypothesis and support the alternative hypothesis which is “True mean is greater than 19”.

2.

```
> t.test(Height~Sex, data = survey, alternative = "less")

        Welch Two Sample t-test

data:  Height by Sex
t = -12.924, df = 192.7, p-value < 2.2e-16
alternative hypothesis: true difference in means between group
 Female and group Male is less than 0
95 percent confidence interval:
      -Inf -11.45907
sample estimates:
mean in group Female   mean in group Male
            165.6867             178.8260
```

Null hypothesis: male students are on average shorter than female students.

Alternative hypothesis: male students are on average taller than female students.

p-value is less than alpha, there is enough evidence to reject the null hypothesis and support the alternative hypothesis which is “male students are on average taller than female students”.

3.

```
hypothesis=function(data, level, meanInfo, units, meanValue, inequality){
  pvalue = t.test(data, mu = meanValue, alternative = inequality, conf.level = 1-level)$p.value
  if (pvalue < level) {
    isAccept = "do"
  } else {
    isAccept = "do not"
  }
  CIsentence = cat("At alpha=",level, "we", isAccept ,"have sufficient evidence that the mean",
                   meanInfo, "is", inequality, "than", meanValue, units, "\n")
  return(CIsentence)
}
```

```
> hypothesis(survey$Pulse, 0.1, "student pulse", "beats per minute", 73, "greater")
At alpha= 0.1 we do have sufficient evidence that the mean student pulse is greater than 73 beats per minute
```

4.

```
> t.test(survey$Wr.Hnd, survey$NW.Hnd, paired = TRUE)

        Paired t-test

data:  survey$Wr.Hnd and survey$NW.Hnd
t = 2.1268, df = 235, p-value = 0.03448
alternative hypothesis: true mean difference is not equal to 0
95 percent confidence interval:
 0.006367389 0.166513967
sample estimates:
mean difference
     0.08644068
```