

# W203 Week 8 Lab 2

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## Part 1: Multiple Choice

1. a - Bar Graphs
2. c -

$$H_0 : \mu = \mu_0; H_a : \mu > \mu_0$$

3. f - none of the above
4. e - Type II error will go up, Power will go down
5. e - Raise the variable to a power greater than 1
6. b - The standard deviation of Berkeley student ages is 2 years
7. d - What is the probability of the data we observe, assuming that the null hypothesis is true
8. c - Assuming your null hypothesis is actually true, and you were to repeat the experiment a large number of times, you would expect a type 1 error 4% of the time.
9. a - Normal sampling distribution of the test statistic.
10. f - None of the above

## Part 2: Test Selection

## Part 3: Data Analysis and Short Answer

```
require(knitr)
```

```
## Loading required package: knitr
```

```
setwd("~/R/W203/W203 Week 8/")
```

```
load("GSS.Rdata")
```

```
# kable(head(GSS))
```

```
head(GSS)
```

```
##   id      wrkstat      marital agewed sibs childs age  birthmo
## 1  1 Working fulltime    divorced   20    3     1  43      May
## 2  2 Working fulltime    never married    0    2     0  44      August
## 3  3 Working fulltime    divorced   25    2     0  43 February
## 4  4 Working parttime    never married    0    4     0  45      NA
## 5  5      Retired never married    0    1     0  78  October
## 6  6      Retired    married   25    2     2  83    March
##   zodiac educ    degree    sex  race    income91    region
## 1  Taurus  11 High school  Male white $40000-49999 Middle Atlantic
## 2   Virgo  16  Bachelor  Male black $40000-49999 Middle Atlantic
## 3 Aquarius  16  Bachelor Female white $40000-49999 Middle Atlantic
```

```

## 4      NA    15 High school Female white      Refused Middle Atlantic
## 5     Libra   17   Graduate Female white      $75000+ Middle Atlantic
## 6    Pisces  11 High school  Male white $20000-22499 Middle Atlantic
##          xnorcsiz vote92 cappun gunlaw      grass      relig      life
## 1 City, GT 250000 voted Oppose Oppose Not Legal      Other Routine
## 2 City, GT 250000 voted Oppose Favor      NAP      None Exciting
## 3 City, GT 250000 voted Favor Favor Not Legal Catholic Exciting
## 4 City, GT 250000 voted Favor NAP      DK Protestant NAP
## 5 City, GT 250000 voted Oppose Favor      NAP Protestant Exciting
## 6 City, GT 250000 voted Favor Favor Not Legal Jewish Routine
##          pillock sexeduc      spanking letdie1      news tvhours
## 1      NAP      NAP      NAP      NAP      NAP      4
## 2 Disagree Favor Strongly Agree Yes Everyday      5
## 3      NAP      NAP      NAP      NAP      NAP      2
## 4 Agree Favor Disagree No Everyday      4
## 5 Strongly Agree Favor Agree No Everyday      1
## 6      NAP      NAP      NAP      NAP      NAP      4
##          bigband      blugrass      country      blues
## 1 Dislike It Dislike It Mixed Feelings Like It
## 2 Like It Mixed Feelings Mixed Feelings Like Very Much
## 3 Like It Mixed Feelings Mixed Feelings Mixed Feelings
## 4 DK Much About It Dislike Very Much Mixed Feelings Mixed Feelings
## 5 Like It Mixed Feelings Dislike It Like Very Much
## 6 Like Very Much Mixed Feelings Mixed Feelings Like Very Much
##          musicals      classicl      folk      jazz
## 1 Like It Like It Very Much Mixed Feelings Like It
## 2 Like It Like It Very Much Like It Like It Very Much
## 3 Like Very Much Like It Very Much Like It Mixed Feelings
## 4 Mixed Feelings Like It Very Much Dislike Very Much Like It
## 5 Like It Like It Very Much Like Very Much Like It Very Much
## 6 Like It DK Much About It Mixed Feelings Like It Very Much
##          opera      rap      hvymetal attsprts visitart
## 1 Like It Dislike Very Much Dislike Very Much No Yes
## 2 Like Very Much Dislike It Dislike Very Much No Yes
## 3 Like Very Much Dislike It Dislike It No Yes
## 4 Dislike Very Much Dislike Very Much Dislike Very Much No Yes
## 5 Like Very Much DK Much About It DK Much About It Yes Yes
## 6 Dislike Very Much Mixed Feelings Dislike Very Much No No
##          scitest4 partners      sexfreq dwelown cohort      politics
## 1      NA 1 Partner Once a Month nap 1950 Tend Cons
## 2 Probably True 2 Partners Once a Month pays rent 1949 Liberal
## 3 Probably True 1 Partner 2-3 Per Week nap 1950 Conservative
## 4 DK NAP NAP pays rent 1948 Moderate
## 5 NA NA NA pays rent 1915 Tend Lib
## 6 Probably True 1 Partner Once a Month nap 1910 Liberal

```

## 13. Data Import and Checking

### 13.a. Examine agedwed

```
sort(unique(GSS$agedwed))
```

```
## [1] 0 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34
## [24] 35 36 37 38 40 41 42 43 45 47 49 50 54 58 99
```

```
GSS$agewed[GSS$agewed < 18]
```

```
## [1] 0 0 0 0 0 0 0 0 0 0 0 16 0 0 0 0 0 0 0 0 17 0 0
## [24] 0 0 0 0 0 0 17 0 0 0 0 0 0 0 0 17 0 0 17 0 0 0 0
## [47] 0 0 0 16 16 0 0 17 16 0 0 0 0 0 0 0 0 17 0 16 0 0
## [70] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 17 0 0 0 0 16 0 0 16
## [93] 0 0 0 0 0 16 0 16 0 0 17 0 0 0 0 0 0 0 16 17 0 0 0
## [116] 0 17 0 0 0 0 0 0 0 0 17 16 17 0 0 15 0 0 0 0 0 0 0
## [139] 0 0 0 0 0 0 0 0 0 0 17 16 14 0 17 17 17 0 17 15 0 0 17 16
## [162] 0 0 17 0 17 0 17 0 16 0 15 0 0 14 17 0 0 0 0 0 0 0 0
## [185] 0 0 0 0 17 0 0 0 0 16 0 0 15 0 0 0 0 0 17 0 0 0 0
## [208] 14 15 0 0 0 0 16 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## [231] 0 0 0 0 0 0 0 0 0 0 16 0 17 0 0 0 17 0 0 0 0 16 0
## [254] 16 0 0 0 16 17 0 0 0 0 0 0 0 0 16 0 0 0 16 0 0 0 16
## [277] 0 17 0 0 0 0 16 17 0 0 17 0 17 0 16 17 0 17 16 0 0 0 0
## [300] 0 0 0 0 0 0 0 0 0 0 0 16 0 0 0 0 16 0 0 0 0 0 0
## [323] 0 0 17 17 13 0 0 0 0 0 0 0 14 0 16 0 0 0 17 17 16 15
## [346] 0 17 0 16 0 16 0 0 0 0 0 0 17 17 0 17 0 15 0 0 0 0 0
## [369] 17 0 17 0 0
```

```
GSS$agewed[GSS$agewed > 58]
```

```
## [1] 99 99 99 99 99 99 99 99 99 99 99 99
```

We can assume that `GSS$agewed == 0` and `GSS$agewed == 99` are not reasonable ages to get married. It would also seem that `GSS$agewed < 18` is not a reasonable age to get married. Marriageable age is 18 in most US states and most other countries, and parental consent is required in the US marry younger than that. However, let's assume that there were cases where people got married younger than 18 and consider those ages valid. It must be noted that in some backward countries like Pakistan, children are sometimes "married" at very young ages, sometimes even at birth, without their consent. That's a horrible practice but we cannot fix that in this assignment. We can only hope that these people will come to their senses soon.

### 13.b. Recode unreasobale agewed as NA

```
# As noted before, we will only recode 0 and 99
# Yes, we're predjudiced against the very old when it comes to marriage
GSS$agewed[GSS$agewed == 0] <- NA
GSS$agewed[GSS$agewed == 99] <- NA

# Calculate the mean, ignoring NA
agewed.mean <- mean(GSS$agewed, na.rm = TRUE)
agewed.mean
```

```
## [1] 22.79201
```

It can be seen that the mean `agewed` is 22.79201 when 0 and 99 are recoded as NA.