

Statistical inference with the GSS data

Setup

Load packages

```
library(ggplot2)
library(dplyr)
library(statsr)
```

Load data

When the data is loaded, the data file will be called `gss`.

```
load("gss.Rdata")
```

Get an overview of the data set.

```
summary(gss)
```

```
##      caseid      year      age      sex      race
##  Min.   :    1  Min.   :1972  Min.   :18.0  Male   :25146  White:46350
## 1st Qu.:14266 1st Qu.:1983 1st Qu.:31.0  Female:31915  Black: 7926
## Median :28531 Median :1993 Median :43.0                Other: 2785
## Mean   :28531 Mean   :1992 Mean   :45.7
## 3rd Qu.:42796 3rd Qu.:2002 3rd Qu.:59.0
## Max.   :57061 Max.   :2012 Max.   :89.0
##
##                NA's      :202
##                hispanic
## Not Hispanic                :16936
## Mexican, Mexican American, Chicano/A: 1204
## Puerto Rican                : 258
## Spanish                     : 83
## Cuban                       : 77
## (Other)                     : 362
## NA's                        :38141
##
##                uscitzn
## A U.S. Citizen                : 3
## Not A U.S. Citizen            : 3
## A U.S. Citizen Born In Puerto Rico, The U.S. Virgin Islands, Or The Northern Marianas Islands :
## Born Outside Of The United States To Parents Who Were U.S Citizens At That Time (If Volunteered):
## NA's                          :56
##
##      educ      paeduc      maeduc      speduc
##  Min.   : 0.00  Min.   : 0.00  Min.   : 0.00  Min.   : 0.00
## 1st Qu.:12.00 1st Qu.: 8.00 1st Qu.: 8.00 1st Qu.:12.00
## Median :12.00 Median :12.00 Median :12.00 Median :12.00
## Mean   :12.75 Mean   :10.55 Mean   :10.71 Mean   :12.78
## 3rd Qu.:15.00 3rd Qu.:13.00 3rd Qu.:12.00 3rd Qu.:15.00
```

```

## Max. :20.00 Max. :20.00 Max. :20.00 Max. :20.00
## NA's :164 NA's :16888 NA's :10132 NA's :27435
## degree veteyears sei
## Lt High School:11822 None :18093 Min. :17.10
## High School :29287 Less Than 2 Yrs : 816 1st Qu.:32.40
## Junior College: 3070 2 To 4 Years : 2123 Median :39.00
## Bachelor : 8002 More Than 4 Yrs : 847 Mean :48.42
## Graduate : 3870 Some,Dk How Long: 5 3rd Qu.:63.50
## NA's : 1010 NA's :35177 Max. :97.20
## NA's :25784
## wrkstat wrkslf marital
## Working Fulltime:28207 Self-Employed: 6197 Married :30761
## Keeping House : 9387 Someone Else :47352 Widowed : 5540
## Retired : 7642 NA's : 3512 Divorced : 7070
## Working Parttime: 5842 Separated : 1984
## Unempl, Laid Off: 1873 Never Married:11686
## (Other) : 4096 NA's : 20
## NA's : 14
## spwrksta sibs childs agekdbn
## Working Fulltime:16815 Min. : 0.00 Min. :0.000 Min. : 9.00
## Keeping House : 5501 1st Qu.: 2.00 1st Qu.:0.000 1st Qu.:20.00
## Retired : 3561 Median : 3.00 Median :2.000 Median :23.00
## Working Parttime: 2743 Mean : 3.94 Mean :1.953 Mean :23.79
## Temp Not Working: 598 3rd Qu.: 5.00 3rd Qu.:3.000 3rd Qu.:27.00
## (Other) : 1479 Max. :68.00 Max. :8.000 Max. :65.00
## NA's :26364 NA's :1679 NA's :181 NA's :38942
## incom16 born parborn
## Far Below Average : 3725 Yes :43705 Both In U.S :39137
## Below Average :10692 No : 4099 Neither In U.S: 5881
## Average :21941 NA's: 9257 Mother Only : 1512
## Above Average : 6575 Father Only : 1047
## Far Above Average : 796 Mother; Fa. Dk: 92
## Lived In Institution: 10 (Other) : 97
## NA's :13322 NA's : 9295
## granborn income06 coninc
## Min. :0.000 $60000 To 74999 : 891 Min. : 383
## 1st Qu.:0.000 Refused : 860 1st Qu.: 18445
## Median :0.000 $40000 To 49999 : 836 Median : 35602
## Mean :1.155 $50000 To 59999 : 734 Mean : 44503
## 3rd Qu.:2.000 $75000 To $89999: 693 3rd Qu.: 59542
## Max. :4.000 (Other) : 6056 Max. :180386
## NA's :12065 NA's :46991 NA's :5829
## region partyid
## South Atlantic :10977 Not Str Democrat :12040
## E. Nor. Central:10572 Strong Democrat : 9117
## Middle Atlantic: 8435 Not Str Republican: 9005
## Pacific : 7630 Independent : 8499
## W. Sou. Central: 5363 Ind,Near Dem : 6743
## W. Nor. Central: 4221 (Other) :11330
## (Other) : 9863 NA's : 327
## polviews relig attend
## Moderate :18494 Protestant:33472 Every Week :11383
## Slightly Conservative: 7691 Catholic :13926 Once A Year : 7476
## Conservative : 7092 None : 6113 Sevrl Times A Yr: 7202

```

## Slightly Liberal	: 6181	Jewish	: 1155	2-3X A Month	: 5060
## Liberal	: 5582	Other	: 998	More Thn Once Wk:	4370
## (Other)	: 2836	(Other)	: 1164	(Other)	:11601
## NA's	: 9185	NA's	: 233	NA's	: 9969
## natspac		natenvir		natheal	
## Too Little : 3941		Too Little :19259		Too Little :21294	
## About Right:12655		About Right: 9539		About Right: 8832	
## Too Much :14631		Too Much : 2816		Too Much : 1955	
## NA's :25834		NA's :25447		NA's :24980	
##					
##					
##					
## natcity		natcrime		natdrug	
## Too Little :14842		Too Little :21500		Too Little :19555	
## About Right: 9522		About Right: 8374		About Right: 9218	
## Too Much : 4732		Too Much : 1907		Too Much : 2642	
## NA's :27965		NA's :25280		NA's :25646	
##					
##					
##					
## nateduc		natrace		natarms	
## Too Little :20619		Too Little :10458		Too Little : 7427	
## About Right: 9374		About Right:13744		About Right:13675	
## Too Much : 2262		Too Much : 6107		Too Much :10325	
## NA's :24806		NA's :26752		NA's :25634	
##					
##					
##					
## nataid		natfare		natroad	
## Too Little : 1934		Too Little : 6525		Too Little :14701	
## About Right: 7286		About Right: 9888		About Right:18954	
## Too Much :22286		Too Much :15345		Too Much : 3840	
## NA's :25555		NA's :25303		NA's :19566	
##					
##					
##					
## natsoc		natmass		natpark	
## Too Little :21443		Too Little :13636		Too Little :12535	
## About Right:13582		About Right:18264		About Right:22861	
## Too Much : 2335		Too Much : 3734		Too Much : 2345	
## NA's :19701		NA's :21427		NA's :19320	
##					
##					
##					
## confinan		conbus		conclerg	
## A Great Deal: 9015		A Great Deal: 8950		A Great Deal:10649	
## Only Some :19659		Only Some :22628		Only Some :18958	
## Hardly Any : 6379		Hardly Any : 5597		Hardly Any : 7755	
## NA's :22008		NA's :19886		NA's :19699	
##					
##					
##					
## coneduc		confed		conlabor	
## A Great Deal:11692		A Great Deal: 6319		A Great Deal: 4461	

```

## Only Some :21322 Only Some :19535 Only Some :20159
## Hardly Any : 5208 Hardly Any :11783 Hardly Any :11884
## NA's :18839 NA's :19424 NA's :20557
##
##
##
## compress conmedic contv
## A Great Deal: 6128 A Great Deal:17931 A Great Deal: 5183
## Only Some :20346 Only Some :17159 Only Some :20484
## Hardly Any :11465 Hardly Any : 3222 Hardly Any :12482
## NA's :19122 NA's :18749 NA's :18912
##
##
##
## conjudge consci conlegis
## A Great Deal:12091 A Great Deal:15362 A Great Deal: 4899
## Only Some :19460 Only Some :17796 Only Some :21756
## Hardly Any : 5551 Hardly Any : 2613 Hardly Any :10959
## NA's :19959 NA's :21290 NA's :19447
##
##
##
## conarmy joblose jobfind
## A Great Deal:14940 Very Likely : 937 Very Easy : 4865
## Only Some :17998 Fairly Likely : 1103 Somewhat Easy: 6120
## Hardly Any : 4709 Not Too Likely : 4830 Not Easy : 7687
## NA's :19414 Not Likely :11897 NA's :38389
## Leaving Labor Force: 5
## NA's :38289
##
##
## satjob richwork jobinc
## Very Satisfied :19717 Continue Working:15383 Most Impt: 4429
## Mod. Satisfied :15736 Stop Working : 6565 Second : 4974
## A Little Dissat : 4109 NA's :35113 Third : 6034
## Very Dissatisfied: 1715 Fourth : 3607
## NA's :15784 Fifth : 1528
## NA's :36489
##
##
## jobsec jobhour jobpromo jobmeans
## Most Impt: 1739 Most Impt: 952 Most Impt: 3810 Most Impt: 9641
## Second : 2781 Second : 1835 Second : 7082 Second : 3899
## Third : 4133 Third : 2334 Third : 4824 Third : 3245
## Fourth : 6516 Fourth : 4913 Fourth : 3085 Fourth : 2450
## Fifth : 5405 Fifth :10537 Fifth : 1769 Fifth : 1333
## NA's :36487 NA's :36490 NA's :36491 NA's :36493
##
##
## class rank satfin
## Lower Class : 3147 Min. : 1.00 Satisfied :15344
## Working Class:24458 1st Qu.: 4.00 More Or Less :23176
## Middle Class :24289 Median : 5.00 Not At All Sat:13934
## Upper Class : 1741 Mean : 4.77 NA's : 4607
## No Class : 1 3rd Qu.: 6.00
## NA's : 3425 Max. :10.00
## NA's :47207

```

```

##          finalter          finrela          unemp          govaaid
## Better      :19697  Far Below Average: 2891  Yes :10990  Yes : 4325
## Worse       :11967  Below Average      :12599  No  :24517  No  : 7760
## Stayed Same:20654  Average          :25957  NA's:21554  NA's:44976
## NA's        : 4743  Above Average      : 9623
##                               Far Above Average: 1045
##                               NA's              : 4946
##
##          getaid          union          getahead
## Yes : 281  R Belongs      : 4424  Hard Work :23022
## No  : 1179  Spouse Belongs : 2056  Both Equally: 7834
## NA's:55601  R And Spouse Belong: 628  Luck Or Help: 4085
##                               Neither Belongs :32270  Other      : 36
##                               NA's            :17683  NA's       :22084
##
##
##          parsol          kidssol          abdefect
## Much Better : 4873  Much Better      : 3587  Yes :31428
## Somewhat Better: 4539  Somewhat Better : 4228  No  : 7788
## About The Same : 3214  About The Same   : 2762  NA's:17845
## Somewhat Worse : 1655  Somewhat Worse   : 1817
## Much Worse     : 546  Much Worse       : 614
## NA's           :42234  No Children -Volunteered-: 1589
##                               NA's              :42464
##
## abnomore      abhlth      abpoor      abrape      absingle      abany
## Yes :17245  Yes :35321  Yes :18471  Yes :31865  Yes :17241  Yes :12887
## No  :21848  No  : 4063  No  :20557  No  : 7116  No  :21779  No  :18920
## NA's:17968  NA's:17677  NA's:18033  NA's:18080  NA's:18041  NA's:25254
##
##
##
##          pillok          sexeduc          divlaw
## Strongly Agree : 5571  Favor :26501  Easier : 9155
## Agree          : 6459  Oppose : 4170  More Difficult:16382
## Disagree       : 4691  Depends: 9  Stay Same : 7147
## Strongly Disagree: 4027  NA's :26381  NA's :24377
## NA's           :36313
##
##
##
##          premarsx          teensex          xmarsex
## Always Wrong : 9244  Always Wrong :15165  Always Wrong :25929
## Almst Always Wrg: 3200  Almst Always Wrg: 3540  Almst Always Wrg: 4581
## Sometimes Wrong : 7044  Sometimes Wrong : 2106  Sometimes Wrong : 2652
## Not Wrong At All:14060  Not Wrong At All: 891  Not Wrong At All: 857
## Other          : 0  Other : 0  Other : 0
## NA's           :23513  NA's :35359  NA's :23042
##
##
##          homosex      suicide1      suicide2      suicide3      suicide4
## Always Wrong :21601  Yes :15924  Yes : 2477  Yes : 2514  Yes : 4579
## Almst Always Wrg: 1581  No :12902  No :27097  No :26990  No :24629
## Sometimes Wrong : 2243  NA's:28235  NA's:27487  NA's:27557  NA's:27853
## Not Wrong At All: 7282
## Other          : 82

```

```

## NA's :24272
##
## fear owngun pistol shotgun rifle
## Yes :14010 Yes :14000 Yes : 7418 Yes : 8457 Yes : 8309
## No :20285 No :20144 No :26479 No :25432 No :25580
## NA's:22766 Refused: 315 Refused: 322 Refused: 322 Refused: 322
## NA's :22602 NA's :22842 NA's :22850 NA's :22850
##
##
##
## news tvhours racdif1 racdif2
## Everyday :17023 Min. : 0.000 Yes : 9630 Yes : 3434
## Few Times A Week : 7654 1st Qu.: 2.000 No :14456 No :20987
## Once A Week : 4599 Median : 2.000 NA's:32975 NA's:32640
## Less Than Once Wk: 3608 Mean : 2.971
## Never : 2805 3rd Qu.: 4.000
## NA's :21372 Max. :24.000
## NA's :23206
## racdif3 racdif4 helppoor
## Yes :12005 Yes :12765 Govt Action : 4806
## No :12454 No :11062 Agree With Both :12273
## NA's:32602 NA's:33234 People Help Selves: 3087
## NA's :36895
##
##
##
## helpnot helpsick
## Govt Do More : 4061 Govt Should Help : 8241
## Agree With Both :10874 Agree With Both : 8903
## Govt Does Too Much: 4137 People Help Selves: 2183
## NA's :37989 NA's :37734
##
##
##
## helpblk
## Govt Help Blks : 2688
## Agree With Both : 8540
## No Special Treatment: 8656
## NA's :37177
##
##
##

```

Part 1: Data

This data set contains a lot of information. We probably won't need all of the columns to answer one questions, so we will need to subset our data according the question we want to answer.

The data set is extracted from the GSS conducted by the NORC at the University of Chicago. This data set is cleaned (missing values are removed and equipped with factor variables). The responses are from a representative sample of Americans about a range of topics. There are 57061 responses (the sample size is 57061), which is less than 10% of the population in the United States. Thus it is reasonable to assume the independence of the sampling corresponding to this data set.

Part 2: Research question

Let's come up with our first question: **what is the percentage of US-born adults (18y/o +) who are employed full (Labor force status) time in year 2008.**

Part 3: Exploratory data analysis

First, notice the min age in this data set is 18 y/o, so we don't need to worry about age column. Let's subset related columns (year, wrkstat, born) and store it in full08

```
wrk <- gss[c('year', 'wrkstat', 'born')]
```

Then, let's focus on year=2008 who works full time:

```
full08 <- subset(wrk, year == 2008 & wrkstat == 'Working Fulltime', select = born)
full08
```

```
##      born
## 51022  No
## 51023  Yes
## 51025  No
## 51028  No
## 51029  No
## 51031  Yes
## 51032  No
## 51037  No
## 51039  No
## 51042  No
## 51047  No
## 51048  Yes
## 51049  No
## 51050  Yes
## 51052  No
## 51053  No
## 51054  No
## 51056  Yes
## 51057  No
## 51063  No
## 51064  Yes
## 51066  No
## 51067  Yes
## 51068  Yes
## 51070  Yes
## 51071  Yes
## 51075  Yes
## 51076  Yes
## 51077  Yes
## 51080  Yes
## 51081  No
## 51083  Yes
## 51084  Yes
## 51086  Yes
```

##	51087	No
##	51092	Yes
##	51094	Yes
##	51098	Yes
##	51099	Yes
##	51100	No
##	51101	No
##	51103	Yes
##	51105	Yes
##	51108	Yes
##	51109	Yes
##	51110	Yes
##	51111	Yes
##	51113	Yes
##	51114	Yes
##	51115	Yes
##	51116	Yes
##	51117	Yes
##	51119	Yes
##	51120	Yes
##	51121	Yes
##	51127	No
##	51128	Yes
##	51129	Yes
##	51130	Yes
##	51131	Yes
##	51135	Yes
##	51136	Yes
##	51140	Yes
##	51141	Yes
##	51142	Yes
##	51143	Yes
##	51144	Yes
##	51145	No
##	51146	Yes
##	51147	No
##	51149	No
##	51150	Yes
##	51153	Yes
##	51155	Yes
##	51156	Yes
##	51157	Yes
##	51159	Yes
##	51161	Yes
##	51165	Yes
##	51166	No
##	51168	Yes
##	51170	No
##	51172	No
##	51179	No
##	51180	Yes
##	51181	No
##	51182	No
##	51188	Yes

##	51189	No
##	51193	Yes
##	51195	Yes
##	51198	Yes
##	51199	Yes
##	51200	Yes
##	51201	Yes
##	51202	Yes
##	51203	No
##	51206	No
##	51207	Yes
##	51208	Yes
##	51209	Yes
##	51210	Yes
##	51211	No
##	51213	Yes
##	51216	Yes
##	51220	Yes
##	51221	Yes
##	51224	Yes
##	51225	No
##	51230	Yes
##	51232	Yes
##	51234	Yes
##	51236	Yes
##	51238	Yes
##	51239	Yes
##	51240	Yes
##	51242	Yes
##	51247	Yes
##	51251	Yes
##	51253	Yes
##	51254	Yes
##	51255	Yes
##	51256	Yes
##	51257	No
##	51258	Yes
##	51260	Yes
##	51262	Yes
##	51263	Yes
##	51264	Yes
##	51265	Yes
##	51267	Yes
##	51270	Yes
##	51272	Yes
##	51273	No
##	51274	Yes
##	51276	Yes
##	51277	No
##	51278	Yes
##	51279	No
##	51283	No
##	51284	Yes
##	51287	Yes

##	51290	No
##	51291	No
##	51292	Yes
##	51294	No
##	51296	No
##	51297	Yes
##	51298	Yes
##	51299	Yes
##	51300	Yes
##	51301	No
##	51302	No
##	51303	Yes
##	51308	No
##	51310	Yes
##	51311	No
##	51312	Yes
##	51318	Yes
##	51319	Yes
##	51320	Yes
##	51322	Yes
##	51323	Yes
##	51324	Yes
##	51325	Yes
##	51330	Yes
##	51332	Yes
##	51335	Yes
##	51336	Yes
##	51339	No
##	51342	Yes
##	51343	Yes
##	51345	No
##	51346	Yes
##	51347	Yes
##	51352	Yes
##	51353	Yes
##	51357	No
##	51361	No
##	51362	Yes
##	51366	Yes
##	51367	No
##	51370	Yes
##	51372	No
##	51373	No
##	51377	No
##	51378	No
##	51380	Yes
##	51381	No
##	51382	Yes
##	51383	Yes
##	51385	Yes
##	51386	No
##	51387	No
##	51388	No
##	51390	No

##	51392	No
##	51393	No
##	51394	Yes
##	51395	Yes
##	51397	Yes
##	51398	Yes
##	51399	Yes
##	51400	Yes
##	51401	Yes
##	51403	No
##	51407	Yes
##	51408	Yes
##	51410	Yes
##	51411	Yes
##	51415	Yes
##	51418	Yes
##	51423	Yes
##	51424	Yes
##	51427	Yes
##	51429	Yes
##	51430	No
##	51431	No
##	51435	No
##	51437	Yes
##	51438	No
##	51440	Yes
##	51441	Yes
##	51442	No
##	51444	Yes
##	51449	Yes
##	51450	Yes
##	51452	Yes
##	51457	No
##	51458	Yes
##	51460	Yes
##	51461	Yes
##	51464	Yes
##	51466	Yes
##	51468	No
##	51469	No
##	51474	Yes
##	51478	No
##	51479	Yes
##	51480	Yes
##	51481	Yes
##	51482	Yes
##	51484	No
##	51485	Yes
##	51486	No
##	51488	Yes
##	51489	Yes
##	51490	Yes
##	51491	Yes
##	51493	No

##	51496	Yes
##	51500	Yes
##	51501	No
##	51502	No
##	51504	Yes
##	51506	Yes
##	51507	Yes
##	51508	Yes
##	51509	Yes
##	51512	Yes
##	51513	Yes
##	51514	Yes
##	51522	No
##	51526	Yes
##	51528	Yes
##	51529	Yes
##	51530	Yes
##	51531	No
##	51533	Yes
##	51534	Yes
##	51535	No
##	51536	Yes
##	51538	Yes
##	51539	Yes
##	51541	No
##	51545	Yes
##	51546	Yes
##	51549	No
##	51550	Yes
##	51552	No
##	51553	Yes
##	51554	No
##	51558	Yes
##	51559	Yes
##	51560	Yes
##	51561	No
##	51563	Yes
##	51564	Yes
##	51565	No
##	51568	Yes
##	51569	No
##	51571	No
##	51580	Yes
##	51582	Yes
##	51583	Yes
##	51584	Yes
##	51586	No
##	51587	Yes
##	51588	Yes
##	51589	Yes
##	51590	Yes
##	51597	Yes
##	51598	Yes
##	51600	Yes

##	51601	Yes
##	51603	Yes
##	51608	Yes
##	51613	Yes
##	51615	Yes
##	51616	Yes
##	51617	Yes
##	51618	Yes
##	51619	Yes
##	51621	Yes
##	51622	Yes
##	51624	Yes
##	51626	Yes
##	51627	Yes
##	51629	Yes
##	51630	Yes
##	51631	Yes
##	51634	No
##	51635	No
##	51637	Yes
##	51638	Yes
##	51639	Yes
##	51641	Yes
##	51642	Yes
##	51645	Yes
##	51647	Yes
##	51648	Yes
##	51649	Yes
##	51650	Yes
##	51652	No
##	51653	Yes
##	51658	Yes
##	51661	Yes
##	51662	Yes
##	51664	Yes
##	51665	Yes
##	51668	Yes
##	51669	Yes
##	51673	Yes
##	51677	Yes
##	51678	Yes
##	51679	Yes
##	51682	Yes
##	51683	No
##	51685	Yes
##	51687	No
##	51691	Yes
##	51693	Yes
##	51694	Yes
##	51696	Yes
##	51698	No
##	51699	Yes
##	51700	Yes
##	51701	Yes

##	51704	Yes
##	51705	Yes
##	51707	No
##	51708	No
##	51709	Yes
##	51710	Yes
##	51711	No
##	51713	No
##	51714	Yes
##	51715	Yes
##	51717	Yes
##	51718	Yes
##	51719	Yes
##	51720	Yes
##	51724	Yes
##	51725	Yes
##	51731	Yes
##	51733	Yes
##	51734	No
##	51736	Yes
##	51737	No
##	51739	Yes
##	51740	No
##	51741	Yes
##	51742	Yes
##	51743	Yes
##	51747	Yes
##	51748	Yes
##	51749	Yes
##	51750	Yes
##	51752	Yes
##	51753	Yes
##	51754	Yes
##	51756	Yes
##	51758	Yes
##	51760	Yes
##	51764	Yes
##	51767	Yes
##	51768	Yes
##	51771	Yes
##	51775	Yes
##	51776	Yes
##	51782	Yes
##	51784	No
##	51785	Yes
##	51787	Yes
##	51789	Yes
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Let's drop all the responses if there is any:

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full08 <- full08 %>% filter(!is.na(born))
full08
```

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## 969 Yes
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## 991 Yes
## 992 Yes
## 993 Yes
## 994 Yes
## 995 No
## 996 Yes
## 997 No
## 998 Yes
## 999 Yes
## 1000 Yes
## 1001 Yes
## 1002 Yes
## 1003 Yes
```

Part 4: Inference

Let's first calculate a **95% confidence interval of the proportion** of U.S. Citizens who are full time employed adults among the sample. There are a total of 1003 responses.

```
dim(full108)
```

```
## [1] 1003    1
```

Among them, 850 responded 'Yes' and 153 responded 'No'. Both of these numbers are greater than 10.

```
summary(full108)
```

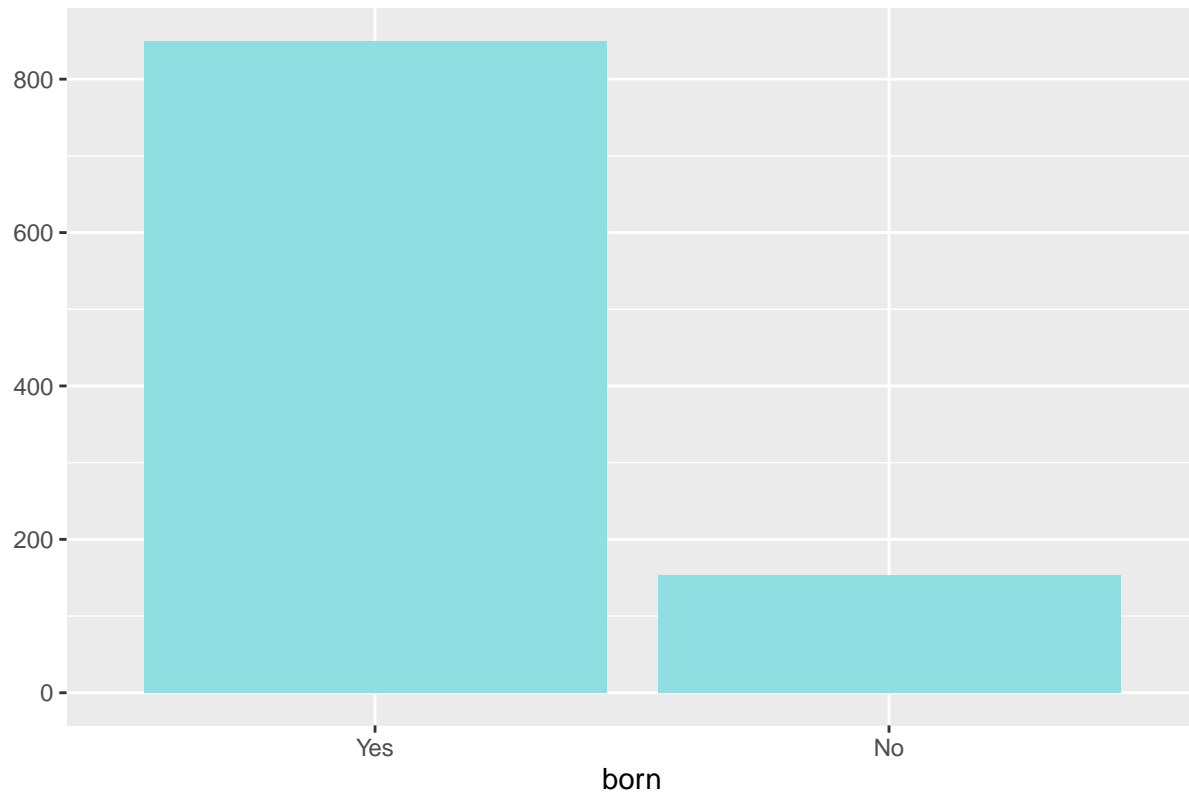
```
##    born
## Yes:850
## No :153
```

It satisfies the conditions for CLT for proportions.

```
inference(born,data=full108,statistic='proportion',type='ci',method='theoretical',success='Yes')
```

```
## Single categorical variable, success: Yes
## n = 1003, p-hat = 0.8475
## 95% CI: (0.8252 , 0.8697)
```

Sample Distribution

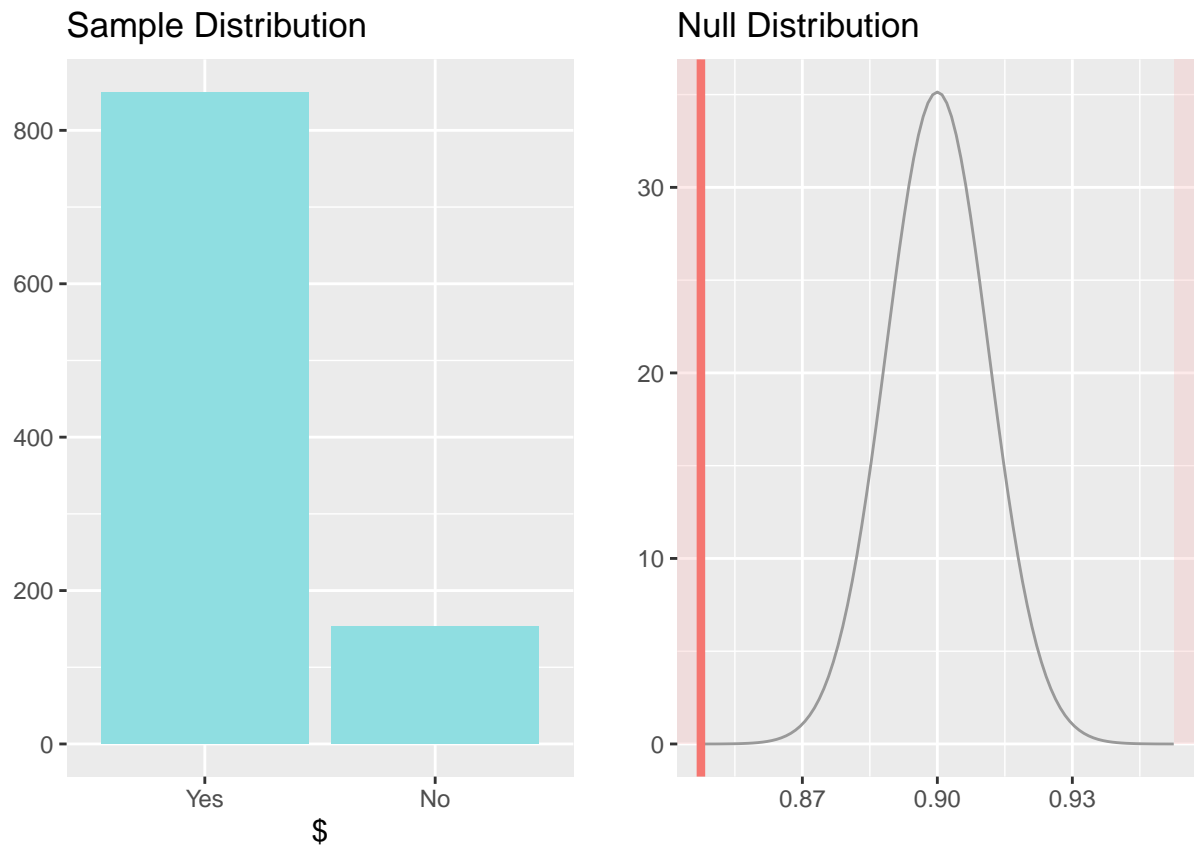


A 95% confidence interval for the proportion of US-born adult working full time in 2008 among all adult working full time in 2008 is (0.8252 , 0.8697).

Next, let's claim that 90% of adults who works full time in 2008 are born in the US. In this case, our null hypothesis is $H_0 = p = 0.9$ and the alternative is $H_A = p \neq 0.9$.

```
inference(full108$born,data=full108,statistic='proportion',type='ht',alternative='twosided',method='theoretical')
```

```
## Single categorical variable, success: Yes
## n = 1003, p-hat = 0.8475
## H0: p = 0.9
## HA: p != 0.9
## z = -4.6281
## p_value = < 0.0001
```



We get a p -value < 0.0001 , with a 5% significance level, we absolutely reject the null hypothesis.