

# BLS - LAUS - Example

Datasets

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## Preamble

```
rm(list = ls())
pklist <- c("tidyverse", "choroplethr", "choroplethrMaps")
source("/Users/geerolf/Drive/work/code-sample/R/load-packages.R")
options(tibble.print_max = 100)
```

The documentation for the LAUS is available here: <https://www.bls.gov/lau/>  
The flat data files of the LAUS are: <https://download.bls.gov/pub/time.series/la/>

## Loading

```
load("la.area_type.RData")
load("la.data.0.RData")
load("la.series.RData")
load("la.measure.RData")
load("la.area.RData")
load("la.data.2.AllStatesU.RData")
load("la.data.3.AllStatesS.RData")
load("la.state_region_division.RData")
```

## State-level LAUS

### Data Structure

Get States:

```
la.series %>%
  filter(area_type_code == "A") %>%
  mutate(series_id = series_id %>% paste) %>%
  as.tibble %>%
  head
```

```
## # A tibble: 6 x 12
##   series_id area_type_code area_code measure_code seasonal srd_code
##   <chr>      <fct>          <fct>          <int> <fct>          <int>
## 1 "LASST01~ A          ST010000~           3 S           1
## 2 "LASST01~ A          ST010000~           4 S           1
## 3 "LASST01~ A          ST010000~           5 S           1
## 4 "LASST01~ A          ST010000~           6 S           1
## 5 "LASST02~ A          ST020000~           3 S           2
## 6 "LASST02~ A          ST020000~           4 S           2
## # ... with 6 more variables: series_title <fct>, footnote_codes <fct>,
## #   begin_year <int>, begin_period <fct>, end_year <int>, end_period <fct>
```

### Downloading

Crosswalk states:

```
load("/Users/geerolf/Drive/work/datasets/crosswalks/crosswalk.state.main.RData")
```

```
BLS.LAUS.state <- la.data.2.AllStatesU %>%
  mutate_at(vars(series_id, period), funs(paste)) %>%
  select(-footnote_codes) %>%
  bind_rows(la.data.3.AllStatesS %>%
    mutate_at(vars(series_id, period), funs(paste)) %>%
    select(-footnote_codes)) %>%
  right_join(la.series %>%
    filter(area_type_code == "A") %>%
    mutate(series_id = series_id %>% paste),
    by = "series_id") %>%
  left_join(la.state_region_division %>%
    mutate(state.name = srd_text %>% paste) %>%
    select(srd_code, state.name),
    by = "srd_code") %>%
  left_join(la.measure %>%
    mutate(measure_text = measure_text %>% paste),
    by = "measure_code") %>%
  left_join(crosswalk.state.main,
    by = "state.name") %>%
  # Remove Annual Data (M13)
  filter(period != "M13") %>%
  mutate(month = period %>% substr(2, 3) %>% as.numeric,
    date = year + (month - 1)/12,
    variable.desc1 = paste(measure_text, "(LAUS)",
```

```

variable = NA,
variable = ifelse(measure_code == 3, "UNR", variable),
variable = ifelse(measure_code == 4, "UN", variable),
variable = ifelse(measure_code == 5, "EMP", variable),
variable = ifelse(measure_code == 6, "LF", variable),
variable = paste0(variable, "_", seasonal, "_LAUS")) %>%
select(variable, variable.desc1, state.code, state.name, date, value) %>%
arrange(variable.desc1)

```

## Saving and Looking

```
save(BLS.LAUS.state, file = "BLS.LAUS.state.RData")
```

```

BLS.LAUS.state %>%
  as.tibble %>%
  head

```

```

## # A tibble: 6 x 6
##   variable variable.desc1 state.code state.name date value
##   <chr>      <chr>      <chr>      <chr>    <dbl> <dbl>
## 1 EMP_S_LAUS employment (LAUS) AL        Alabama  1976  1392154
## 2 EMP_S_LAUS employment (LAUS) AL        Alabama  1976.  1391975
## 3 EMP_S_LAUS employment (LAUS) AL        Alabama  1976.  1392137
## 4 EMP_S_LAUS employment (LAUS) AL        Alabama  1976.  1393177
## 5 EMP_S_LAUS employment (LAUS) AL        Alabama  1976.  1394591
## 6 EMP_S_LAUS employment (LAUS) AL        Alabama  1976.  1396510

```

## County-level LAUS

### Data Structure

```

la.series %>%
  mutate(series_id = series_id %>% paste %>% gsub(" ", "", .)) %>%
  # F is counties and equivalent
  filter(area_type_code == "F") %>%
  left_join(la.measure %>%
    rename(variable.desc1 = measure_text),
    by = "measure_code") %>%
  select(series_id, measure_code, variable.desc1) %>%
  as.tibble %>%
  head

```

```

## # A tibble: 6 x 3
##   series_id      measure_code variable.desc1
##   <chr>          <int> <fct>
## 1 LAUCN0100100000000003      3 unemployment rate
## 2 LAUCN0100100000000004      4 unemployment
## 3 LAUCN0100100000000005      5 employment
## 4 LAUCN0100100000000006      6 labor force
## 5 LAUCN0100300000000003      3 unemployment rate
## 6 LAUCN0100300000000004      4 unemployment

```

## Downloading

```
BLS.LAUS.county <- la.data.0 %>%
  mutate_at(vars(series_id, period), funs(paste)) %>%
  select(-footnote_codes) %>%
  right_join(la.series %>%
    filter(area_type_code == "F") %>%
    select(-footnote_codes) %>%
    mutate(series_id = series_id %>% paste),
    by = "series_id") %>%
  left_join(la.measure,
    by = "measure_code") %>%
  # Remove Annual Data (M13)
  filter(period != "M13") %>%
  mutate(month = period %>% substr(2, 3) %>% as.numeric,
    date = year + (month - 1)/12,
    value = value %>% as.numeric,
    fips = series_id %>% substr(6, 10) %>% as.numeric,
    variable.desc1 = paste(measure_text, "(LAUS)",
      variable = NA,
      variable = ifelse(measure_code == 3, "UNR", variable),
      variable = ifelse(measure_code == 4, "UN", variable),
      variable = ifelse(measure_code == 5, "EMP", variable),
      variable = ifelse(measure_code == 6, "LF", variable),
      variable = paste0(variable, "_LAUS")) %>%
  select(variable, variable.desc1, fips, date, value) %>%
  filter(!is.na(value)) %>%
  arrange(variable, variable.desc1, fips, date)
```

```
## Warning in function_list[[k]](value): NAs introduced by coercion
```

## Saving and Looking

```
save(BLS.LAUS.county, file = "BLS.LAUS.county.RData")
```

```
BLS.LAUS.county %>%
  as.tibble %>%
  head
```

```
## # A tibble: 6 x 5
##   variable variable.desc1      fips  date value
##   <chr>      <chr>          <dbl> <dbl> <dbl>
## 1 EMP_LAUS employment (LAUS)  1001 1990  15469
## 2 EMP_LAUS employment (LAUS)  1001 1990. 15487
## 3 EMP_LAUS employment (LAUS)  1001 1990. 15693
## 4 EMP_LAUS employment (LAUS)  1001 1990. 15744
## 5 EMP_LAUS employment (LAUS)  1001 1990. 15824
## 6 EMP_LAUS employment (LAUS)  1001 1990. 15891
```

# Metropolitan level LAUS

## Data Structure

Get metropolitan areas:

```
la.series %>%
  filter(area_type_code == "B") %>%
  mutate(series_id = series_id %>% paste) %>%
  as.tibble %>%
  head
```

```
## # A tibble: 6 x 12
##   series_id area_type_code area_code measure_code seasonal srd_code
##   <chr>      <fct>          <fct>         <int> <fct>         <int>
## 1 "LASMT26~ B          MT261982~         3 S          26
## 2 "LASMT26~ B          MT261982~         4 S          26
## 3 "LASMT26~ B          MT261982~         5 S          26
## 4 "LASMT26~ B          MT261982~         6 S          26
## 5 "LASMT39~ B          MT391746~         3 S          39
## 6 "LASMT39~ B          MT391746~         4 S          39
## # ... with 6 more variables: series_title <fct>, footnote_codes <fct>,
## #   begin_year <int>, begin_period <fct>, end_year <int>, end_period <fct>
```

## Downloading

```
BLS.LAUS.msa <- la.data.0 %>%
  mutate_at(vars(series_id, period), funs(paste)) %>%
  select(-footnote_codes) %>%
  right_join(la.series %>%
    filter(area_type_code == "B") %>%
    select(-footnote_codes) %>%
    mutate(series_id = series_id %>% paste),
    by = "series_id") %>%
  left_join(la.measure,
    by = "measure_code") %>%
  # Remove Annual Data (M13)
  filter(period != "M13") %>%
  mutate(month = period %>% substr(2, 3) %>% as.numeric,
    date = year + (month - 1)/12,
    value = value %>% as.numeric,
    fips = series_id %>% substr(8, 12) %>% as.numeric,
    variable.desc1 = paste(measure_text, "(LAUS)",
    variable = NA,
    variable = ifelse(measure_code == 3, "UNR", variable),
    variable = ifelse(measure_code == 4, "UN", variable),
    variable = ifelse(measure_code == 5, "EMP", variable),
    variable = ifelse(measure_code == 6, "LF", variable),
    variable = paste0(variable, "_LAUS")) %>%
  select(variable, variable.desc1, fips, date, value) %>%
  filter(!is.na(value)) %>%
  arrange(variable, variable.desc1, fips, date)
```

```
## Warning in function_list[[k]](value): NAs introduced by coercion
```

## Saving and Looking

```
save(BLS.LAUS.msa, file = "BLS.LAUS.msa.RData")
```

```
BLS.LAUS.msa %>%
  as.tibble %>%
  head
```

```
## # A tibble: 6 x 5
##   variable variable.desc1      fips  date value
##   <chr>      <chr>          <dbl> <dbl> <dbl>
## 1 EMP_LAUS employment (LAUS) 10180 1990  64873
## 2 EMP_LAUS employment (LAUS) 10180 1990.  64310
## 3 EMP_LAUS employment (LAUS) 10180 1990.  64546
## 4 EMP_LAUS employment (LAUS) 10180 1990.  64960
## 5 EMP_LAUS employment (LAUS) 10180 1990.  64923
## 6 EMP_LAUS employment (LAUS) 10180 1990.  64169
```

## Computing Environment

```
Sys.time()
```

```
## [1] "2018-09-29 18:06:28 PDT"
```

```
sessionInfo()
```

```
## R version 3.5.1 (2018-07-02)
## Platform: x86_64-apple-darwin15.6.0 (64-bit)
## Running under: macOS High Sierra 10.13.6
##
## Matrix products: default
## BLAS: /Library/Frameworks/R.framework/Versions/3.5/Resources/lib/libRblas.0.dylib
## LAPACK: /Library/Frameworks/R.framework/Versions/3.5/Resources/lib/libRlapack.dylib
##
## locale:
## [1] en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8
##
## attached base packages:
## [1] stats      graphics  grDevices  utils      datasets  methods   base
##
## other attached packages:
## [1] bindrcpp_0.2.2      choroplethrMaps_1.0.1 choroplethr_3.6.3
## [4] acs_2.1.3           XML_3.98-1.16        forcats_0.3.0
## [7] stringr_1.3.1       dplyr_0.7.6          purrr_0.2.5
## [10] readr_1.1.1         tidyr_0.8.1          tibble_1.4.2
## [13] ggplot2_3.0.0       tidyverse_1.2.1
##
## loaded via a namespace (and not attached):
## [1] nlme_3.1-137        sf_0.6-3             lubridate_1.7.4
## [4] RColorBrewer_1.1-2 httr_1.3.1           rprojroot_1.3-2
```

## [7] tools_3.5.1	backports_1.1.2	utf8_1.1.4
## [10] rgdal_1.3-4	R6_2.2.2	rpart_4.1-13
## [13] spData_0.2.9.3	Hmisc_4.1-1	DBI_1.0.0
## [16] lazyeval_0.2.1	colorspace_1.3-2	nnet_7.3-12
## [19] withr_2.1.2	sp_1.3-1	tidyselect_0.2.4
## [22] gridExtra_2.3	compiler_3.5.1	cli_1.0.0
## [25] rvest_0.3.2	htmlTable_1.12	xml2_1.2.0
## [28] scales_1.0.0	checkmate_1.8.5	classInt_0.2-3
## [31] rappdirs_0.3.1	digest_0.6.15	foreign_0.8-70
## [34] rmarkdown_1.10	base64enc_0.1-3	jpeg_0.1-8
## [37] pkgconfig_2.0.2	htmltools_0.3.6	maps_3.3.0
## [40] htmlwidgets_1.2	rlang_0.2.2	readxl_1.1.0
## [43] rstudioapi_0.7	bindr_0.1.1	jsonlite_1.5
## [46] acepack_1.4.1	magrittr_1.5	Formula_1.2-3
## [49] geosphere_1.5-7	Matrix_1.2-14	fansi_0.3.0
## [52] Rcpp_0.12.18	munsell_0.5.0	proto_1.0.0
## [55] stringi_1.2.4	yaml_2.2.0	RJSONIO_1.3-0
## [58] plyr_1.8.4	grid_3.5.1	maptools_0.9-3
## [61] WDI_2.5	crayon_1.3.4	lattice_0.20-35
## [64] haven_1.1.2	splines_3.5.1	mapproj_1.2.6
## [67] hms_0.4.2	knitr_1.20	pillar_1.3.0
## [70] uuid_0.1-2	rjson_0.2.20	reshape2_1.4.3
## [73] glue_1.3.0	evaluate_0.11	latticeExtra_0.6-28
## [76] data.table_1.11.4	modelr_0.1.2	png_0.1-7
## [79] RgoogleMaps_1.4.2	cellranger_1.1.0	gtable_0.2.0
## [82] assertthat_0.2.0	broom_0.5.0	e1071_1.7-0
## [85] class_7.3-14	survival_2.42-3	tigris_0.7
## [88] units_0.6-0	cluster_2.0.7-1	ggmap_2.6.1