Regression

Tyler Bontrager, Ganesh Singh

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```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.2 --
## v ggplot2 3.3.6      v purrr   0.3.4
## v tibble  3.1.8      v dplyr   1.0.10
## v tidyr   1.2.1      v stringr 1.4.1
## v readr   2.1.2      v forcats 0.5.2
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(ggplot2)
?ggplot2
```

```
# IMPORTING DATASETS
tuition_cost <- readr::read_csv('https://raw.githubusercontent.com/rfordatascience/tidytuesday/master/d
```

```
## Rows: 2973 Columns: 10
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (5): name, state, state_code, type, degree_length
## dbl (5): room_and_board, in_state_tuition, in_state_total, out_of_state_tuit...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
tc = tuition_cost

tuition_income <- readr::read_csv('https://raw.githubusercontent.com/rfordatascience/tidytuesday/master
```

```
## Rows: 209012 Columns: 7
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (4): name, state, campus, income_lvl
## dbl (3): total_price, year, net_cost
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
ti = tuition_income

salary_potential <- readr::read_csv('https://raw.githubusercontent.com/rfordatascience/tidytuesday/mast
```

```
## Rows: 935 Columns: 7
## -- Column specification --------------------------------------------------------
```

```
## Delimiter: ","
## chr (2): name, state_name
## dbl (5): rank, early_career_pay, mid_career_pay, make_world_better_percent, ...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
sp = salary_potential

historical_tuition <- readr::read_csv('https://raw.githubusercontent.com/rfordatascience/tidytuesday/ma
```

```
## Rows: 270 Columns: 4
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (3): type, year, tuition_type
## dbl (1): tuition_cost
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
ht = historical_tuition

diversity_school <- readr::read_csv('https://raw.githubusercontent.com/rfordatascience/tidytuesday/mast
```

```
## Rows: 50655 Columns: 5
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (3): name, state, category
## dbl (2): total_enrollment, enrollment
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
ds = diversity_school
```

```
str(tc)
```

```
## spec_tbl_df [2,973 x 10] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
##  $ name                : chr [1:2973] "Aaniiih Nakoda College" "Abilene Christian University" "Abraha
##  $ state               : chr [1:2973] "Montana" "Texas" "Georgia" "Minnesota" ...
##  $ state_code          : chr [1:2973] "MT" "TX" "GA" "MN" ...
##  $ type                : chr [1:2973] "Public" "Private" "Public" "For Profit" ...
##  $ degree_length       : chr [1:2973] "2 Year" "4 Year" "2 Year" "2 Year" ...
##  $ room_and_board      : num [1:2973] NA 10350 8474 NA 16648 ...
##  $ in_state_tuition    : num [1:2973] 2380 34850 4128 17661 27810 ...
##  $ in_state_total      : num [1:2973] 2380 45200 12602 17661 44458 ...
##  $ out_of_state_tuition: num [1:2973] 2380 34850 12550 17661 27810 ...
##  $ out_of_state_total  : num [1:2973] 2380 45200 21024 17661 44458 ...
##  - attr(*, "spec")=
##   .. cols(
##   ..   name = col_character(),
##   ..   state = col_character(),
##   ..   state_code = col_character(),
##   ..   type = col_character(),
##   ..   degree_length = col_character(),
##   ..   room_and_board = col_double(),
##   ..   in_state_tuition = col_double(),
```

```
##   ..   in_state_total = col_double(),
##   ..   out_of_state_tuition = col_double(),
##   ..   out_of_state_total = col_double()
##   .. )
##  - attr(*, "problems")=<externalptr>
```

```
str(ti)
```

```
## spec_tbl_df [209,012 x 7] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
##  $ name       : chr [1:209012] "Piedmont International University" "Piedmont International University
##  $ state      : chr [1:209012] "NC" "NC" "NC" "NC" ...
##  $ total_price: num [1:209012] 20174 20174 20174 20174 20514 ...
##  $ year       : num [1:209012] 2016 2016 2016 2016 2017 ...
##  $ campus     : chr [1:209012] "On Campus" "On Campus" "On Campus" "On Campus" ...
##  $ net_cost   : num [1:209012] 11475 11451 16229 15592 11668 ...
##  $ income_lvl : chr [1:209012] "0 to 30,000" "30,001 to 48,000" "48_001 to 75,000" "75,001 to 110,00
##  - attr(*, "spec")=
##   .. cols(
##   ..   name = col_character(),
##   ..   state = col_character(),
##   ..   total_price = col_double(),
##   ..   year = col_double(),
##   ..   campus = col_character(),
##   ..   net_cost = col_double(),
##   ..   income_lvl = col_character()
##   .. )
##  - attr(*, "problems")=<externalptr>
```

```
str(sp)
```

```
## spec_tbl_df [935 x 7] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
##  $ rank                     : num [1:935] 1 2 3 4 5 6 7 8 9 10 ...
##  $ name                     : chr [1:935] "Auburn University" "University of Alabama in Huntsville"
##  $ state_name               : chr [1:935] "Alabama" "Alabama" "Alabama" "Alabama" ...
##  $ early_career_pay         : num [1:935] 54400 57500 52300 54500 48400 46600 49100 48600 47700 4870
##  $ mid_career_pay           : num [1:935] 104500 103900 97400 93500 90500 ...
##  $ make_world_better_percent: num [1:935] 51 59 50 61 52 53 48 57 56 58 ...
##  $ stem_percent             : num [1:935] 31 45 15 30 3 12 27 17 17 20 ...
##  - attr(*, "spec")=
##   .. cols(
##   ..   rank = col_double(),
##   ..   name = col_character(),
##   ..   state_name = col_character(),
##   ..   early_career_pay = col_double(),
##   ..   mid_career_pay = col_double(),
##   ..   make_world_better_percent = col_double(),
##   ..   stem_percent = col_double()
##   .. )
##  - attr(*, "problems")=<externalptr>
```

```
str(ht)
```

```
## spec_tbl_df [270 x 4] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
##  $ type        : chr [1:270] "All Institutions" "All Institutions" "All Institutions" "All Instituti
##  $ year        : chr [1:270] "1985-86" "1985-86" "1985-86" "1985-86" ...
##  $ tuition_type: chr [1:270] "All Constant" "4 Year Constant" "2 Year Constant" "All Current" ...
```

```
##  $ tuition_cost: num [1:270] 10893 12274 7508 4885 5504 ...
##  - attr(*, "spec")=
##   .. cols(
##   ..   type = col_character(),
##   ..   year = col_character(),
##   ..   tuition_type = col_character(),
##   ..   tuition_cost = col_double()
##   .. )
##  - attr(*, "problems")=<externalptr>
```

```
str(ds)
```

```
## spec_tbl_df [50,655 x 5] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
##  $ name            : chr [1:50655] "University of Phoenix-Arizona" "University of Phoenix-Arizona" "
##  $ total_enrollment: num [1:50655] 195059 195059 195059 195059 195059 ...
##  $ state           : chr [1:50655] "Arizona" "Arizona" "Arizona" "Arizona" ...
##  $ category        : chr [1:50655] "Women" "American Indian / Alaska Native" "Asian" "Black" ...
##  $ enrollment      : num [1:50655] 134722 876 1959 31455 13984 ...
##  - attr(*, "spec")=
##   .. cols(
##   ..   name = col_character(),
##   ..   total_enrollment = col_double(),
##   ..   state = col_character(),
##   ..   category = col_character(),
##   ..   enrollment = col_double()
##   .. )
##  - attr(*, "problems")=<externalptr>
```

```
tcFactored = tc %>%
  mutate(degFactor = as.factor(degree_length))
tcFactored
```

```
## # A tibble: 2,973 x 11
##    name      state state~1 type  degre~2 room_~3 in_st~4 in_st~5 out_o~6 out_o~7
##    <chr>     <chr> <chr>   <chr> <chr>     <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
##  1 Aaniiih ~ Mont~ MT      Publ~ 2 Year       NA    2380    2380    2380    2380
##  2 Abilene ~ Texas TX      Priv~ 4 Year    10350   34850   45200   34850   45200
##  3 Abraham ~ Geor~ GA      Publ~ 2 Year     8474    4128   12602   12550   21024
##  4 Academy ~ Minn~ MN      For ~ 2 Year       NA   17661   17661   17661   17661
##  5 Academy ~ Cali~ CA      For ~ 4 Year    16648   27810   44458   27810   44458
##  6 Adams St~ Colo~ CO      Publ~ 4 Year     8782    9440   18222   20456   29238
##  7 Adelphi ~ New ~ NY      Priv~ 4 Year    16030   38660   54690   38660   54690
##  8 Adironda~ New ~ NY      Publ~ 2 Year    11660    5375   17035    9935   21595
##  9 Adrian C~ Mich~ MI      Priv~ 4 Year    11318   37087   48405   37087   48405
## 10 Advanced~ Virg~ VA      For ~ 2 Year       NA   13680   13680   13680   13680
## # ... with 2,963 more rows, 1 more variable: degFactor <fct>, and abbreviated
## #   variable names 1: state_code, 2: degree_length, 3: room_and_board,
## #   4: in_state_tuition, 5: in_state_total, 6: out_of_state_tuition,
## #   7: out_of_state_total
```

```
tcFacJoinSp = tcFactored %>%
  inner_join(sp, by=c("name"="name"))
tcFacJoinSp
```

```
## # A tibble: 728 x 17
##    name      state state~1 type  degre~2 room_~3 in_st~4 in_st~5 out_o~6 out_o~7
```

```
##    <chr>     <chr> <chr>   <chr> <chr>     <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
##  1 Adams St~ Colo~ CO      Publ~ 4 Year     8782    9440   18222   20456   29238
##  2 Adventis~ Flor~ FL      Priv~ 4 Year     4200   15150   19350   15150   19350
##  3 Agnes Sc~ Geor~ GA      Priv~ 4 Year    12330   41160   53490   41160   53490
##  4 Alabama ~ Alab~ AL      Publ~ 4 Year     5422   11068   16490   19396   24818
##  5 Alaska P~ Alas~ AK      Priv~ 4 Year     7300   20830   28130   20830   28130
##  6 Albany C~ New ~ NY      Priv~ 4 Year    10920   35105   46025   35105   46025
##  7 Albertus~ Conn~ CT      Priv~ 4 Year    13200   32060   45260   32060   45260
##  8 Albion C~ Mich~ MI      Priv~ 4 Year    12380   45775   58155   45775   58155
##  9 Alcorn S~ Miss~ MS      Publ~ 4 Year     9608    7144   16752    7144   16752
## 10 Allen Co~ Iowa  IA      Priv~ 4 Year     7282   19970   27252   19970   27252
## # ... with 718 more rows, 7 more variables: degFactor <fct>, rank <dbl>,
## #   state_name <chr>, early_career_pay <dbl>, mid_career_pay <dbl>,
## #   make_world_better_percent <dbl>, stem_percent <dbl>, and abbreviated
## #   variable names 1: state_code, 2: degree_length, 3: room_and_board,
## #   4: in_state_tuition, 5: in_state_total, 6: out_of_state_tuition,
## #   7: out_of_state_total
```

```
tcFactored
```

```
## # A tibble: 2,973 x 11
##    name      state state~1 type  degre~2 room_~3 in_st~4 in_st~5 out_o~6 out_o~7
##    <chr>     <chr> <chr>   <chr> <chr>     <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
##  1 Aaniiih ~ Mont~ MT      Publ~ 2 Year       NA    2380    2380    2380    2380
##  2 Abilene ~ Texas TX      Priv~ 4 Year    10350   34850   45200   34850   45200
##  3 Abraham ~ Geor~ GA      Publ~ 2 Year     8474    4128   12602   12550   21024
##  4 Academy ~ Minn~ MN      For ~ 2 Year       NA   17661   17661   17661   17661
##  5 Academy ~ Cali~ CA      For ~ 4 Year    16648   27810   44458   27810   44458
##  6 Adams St~ Colo~ CO      Publ~ 4 Year     8782    9440   18222   20456   29238
##  7 Adelphi ~ New ~ NY      Priv~ 4 Year    16030   38660   54690   38660   54690
##  8 Adironda~ New ~ NY      Publ~ 2 Year    11660    5375   17035    9935   21595
##  9 Adrian C~ Mich~ MI      Priv~ 4 Year    11318   37087   48405   37087   48405
## 10 Advanced~ Virg~ VA      For ~ 2 Year       NA   13680   13680   13680   13680
## # ... with 2,963 more rows, 1 more variable: degFactor <fct>, and abbreviated
## #   variable names 1: state_code, 2: degree_length, 3: room_and_board,
## #   4: in_state_tuition, 5: in_state_total, 6: out_of_state_tuition,
## #   7: out_of_state_total
```

```
sp
```

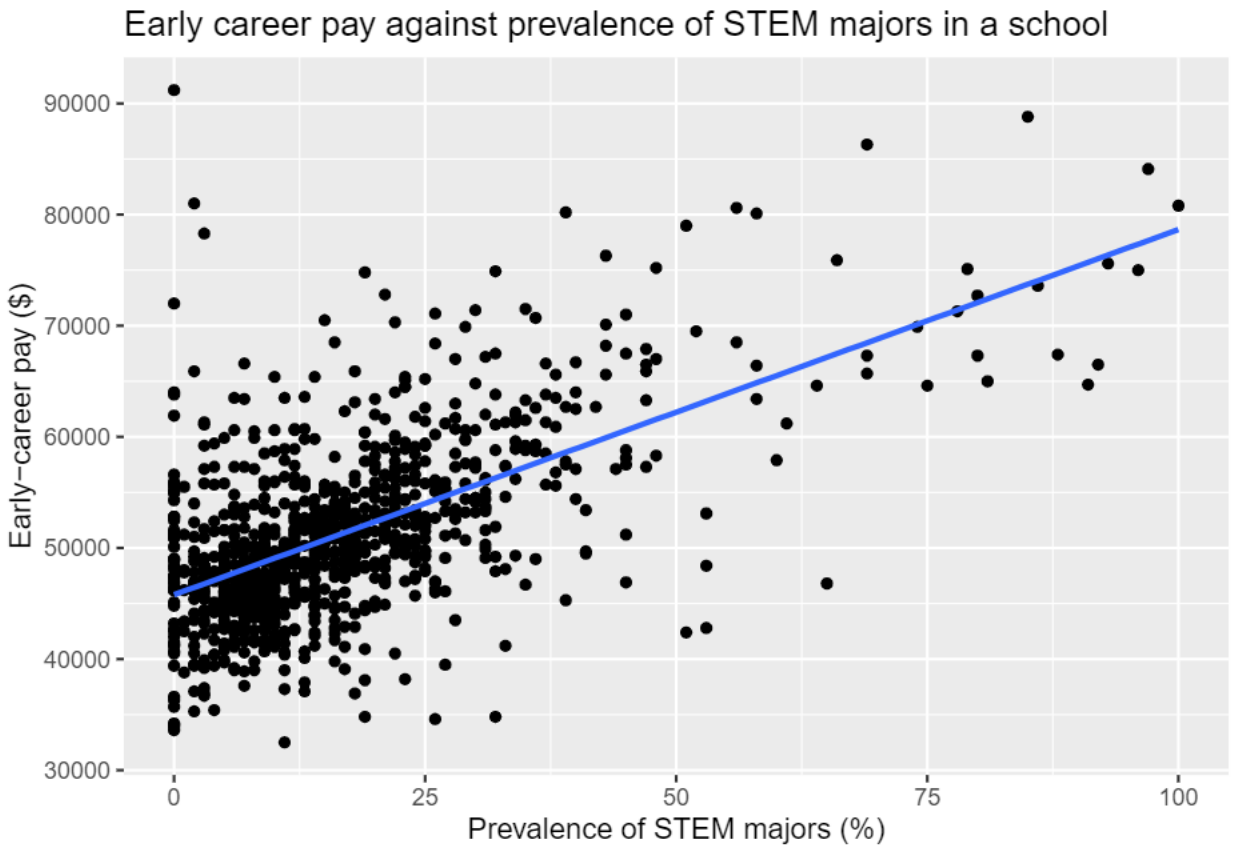
```
## # A tibble: 935 x 7
##     rank name                           state~1 early~2 mid_c~3 make_~4 stem_~5
##    <dbl> <chr>                          <chr>     <dbl>   <dbl>   <dbl>   <dbl>
##  1     1 Auburn University              Alabama   54400  104500      51      31
##  2     2 University of Alabama in Hunts~ Alabama   57500  103900      59      45
##  3     3 The University of Alabama       Alabama   52300   97400      50      15
##  4     4 Tuskegee University             Alabama   54500   93500      61      30
##  5     5 Samford University              Alabama   48400   90500      52       3
##  6     6 Spring Hill College             Alabama   46600   89100      53      12
##  7     7 Birmingham Southern College     Alabama   49100   88300      48      27
##  8     8 University of Alabama at Birmi~ Alabama   48600   87200      57      17
##  9     9 University of South Alabama     Alabama   47700   86400      56      17
## 10    10 Alabama A&M University          Alabama   48700   83500      58      20
## # ... with 925 more rows, and abbreviated variable names 1: state_name,
## #   2: early_career_pay, 3: mid_career_pay, 4: make_world_better_percent,
## #   5: stem_percent
```

```
tcFacJoinSp
```

```
## # A tibble: 728 x 17
##    name      state state~1 type  degre~2 room_~3 in_st~4 in_st~5 out_o~6 out_o~7
##    <chr>     <chr> <chr>   <chr> <chr>     <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
##  1 Adams St~ Colo~ CO      Publ~ 4 Year     8782    9440   18222   20456   29238
##  2 Adventis~ Flor~ FL      Priv~ 4 Year     4200   15150   19350   15150   19350
##  3 Agnes Sc~ Geor~ GA      Priv~ 4 Year    12330   41160   53490   41160   53490
##  4 Alabama ~ Alab~ AL      Publ~ 4 Year     5422   11068   16490   19396   24818
##  5 Alaska P~ Alas~ AK      Priv~ 4 Year     7300   20830   28130   20830   28130
##  6 Albany C~ New ~ NY      Priv~ 4 Year    10920   35105   46025   35105   46025
##  7 Albertus~ Conn~ CT      Priv~ 4 Year    13200   32060   45260   32060   45260
##  8 Albion C~ Mich~ MI      Priv~ 4 Year    12380   45775   58155   45775   58155
##  9 Alcorn S~ Miss~ MS      Publ~ 4 Year     9608    7144   16752    7144   16752
## 10 Allen Co~ Iowa  IA      Priv~ 4 Year     7282   19970   27252   19970   27252
## # ... with 718 more rows, 7 more variables: degFactor <fct>, rank <dbl>,
## #   state_name <chr>, early_career_pay <dbl>, mid_career_pay <dbl>,
## #   make_world_better_percent <dbl>, stem_percent <dbl>, and abbreviated
## #   variable names 1: state_code, 2: degree_length, 3: room_and_board,
## #   4: in_state_tuition, 5: in_state_total, 6: out_of_state_tuition,
## #   7: out_of_state_total
```

```
ggplot(sp, aes(stem_percent,early_career_pay)) + geom_point() +
  geom_smooth(method="lm",se=FALSE)+
  ggtitle("Early career pay against prevalence of STEM majors in a school")+
  xlab("Prevalence of STEM majors (%)")+
  ylab("Early-career pay ($)")
```

```
## `geom_smooth()` using formula 'y ~ x'
```




```
ECSPmodel = lm(early_career_pay~stem_percent,data=tcFacJoinSp)
summary(ECSPmodel)
```

```
##
## Call:
## lm(formula = early_career_pay ~ stem_percent, data = tcFacJoinSp)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -21130  -4042   -636   3052  34769
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  45584.50     353.63  128.91   <2e-16 ***
## stem_percent   323.30      15.45   20.93   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6533 on 726 degrees of freedom
## Multiple R-squared:  0.3763, Adjusted R-squared:  0.3754
## F-statistic:   438 on 1 and 726 DF,  p-value: < 2.2e-16
```

Slope: 323.30 Y-intercept: 45584.50

```
cor(x=sp$stem_percent,y=sp$early_career_pay)
```

```
## [1] 0.6050609
```

```
cor(x=sp$stem_percent,y=sp$mid_career_pay)
```

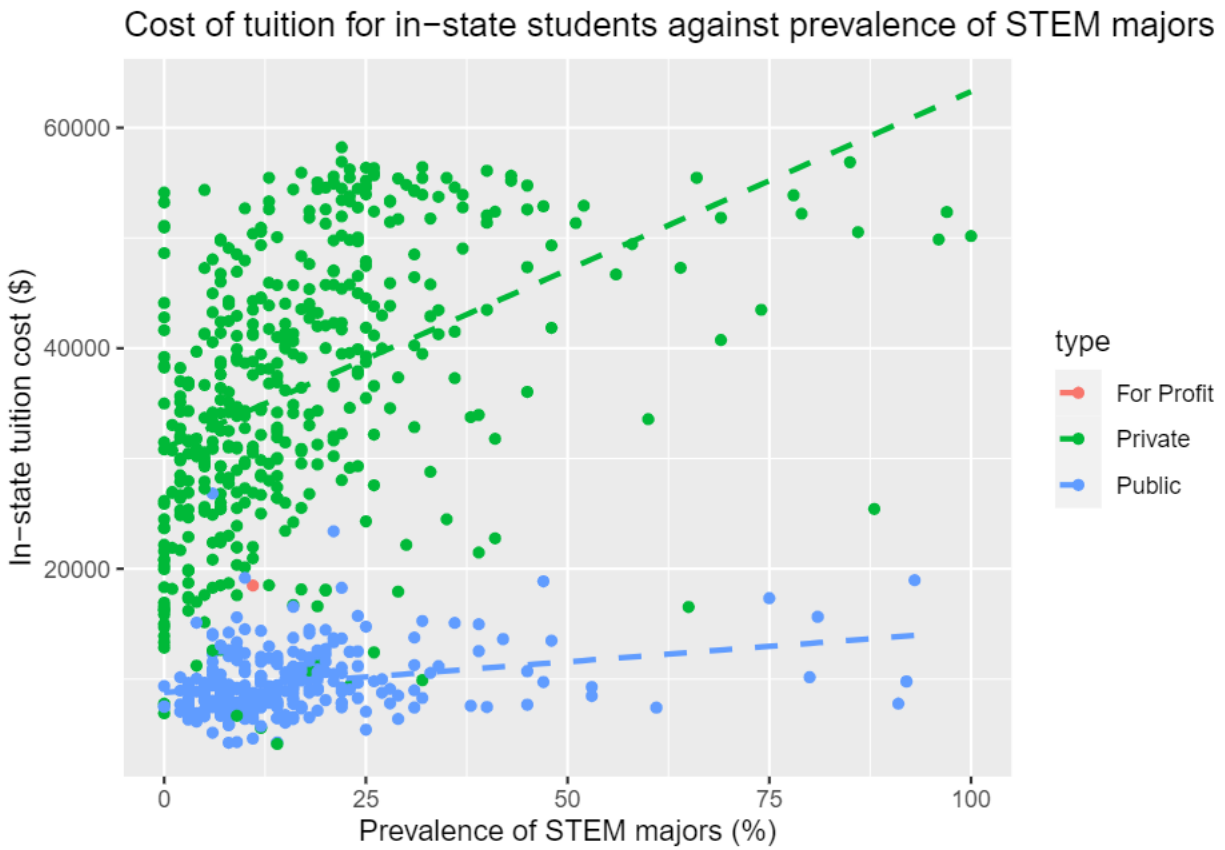
```
## [1] 0.6212143
```

Moderately strong positive association between prevalence of STEM majors at a school and general alumni early-career earnings.

Boring. STEM jobs tend to pay really well. Let's do something fun. Hear me out...

```
ggplot(tcFacJoinSp, aes(x=stem_percent,y=in_state_tuition,color=type)) +
  geom_point() +
  geom_smooth(method="lm",se=FALSE,lty=2) +
  ggtitle("Cost of tuition for in-state students against prevalence of STEM majors")+
  xlab("Prevalence of STEM majors (%)")+
  ylab("In-state tuition cost ($)")
```

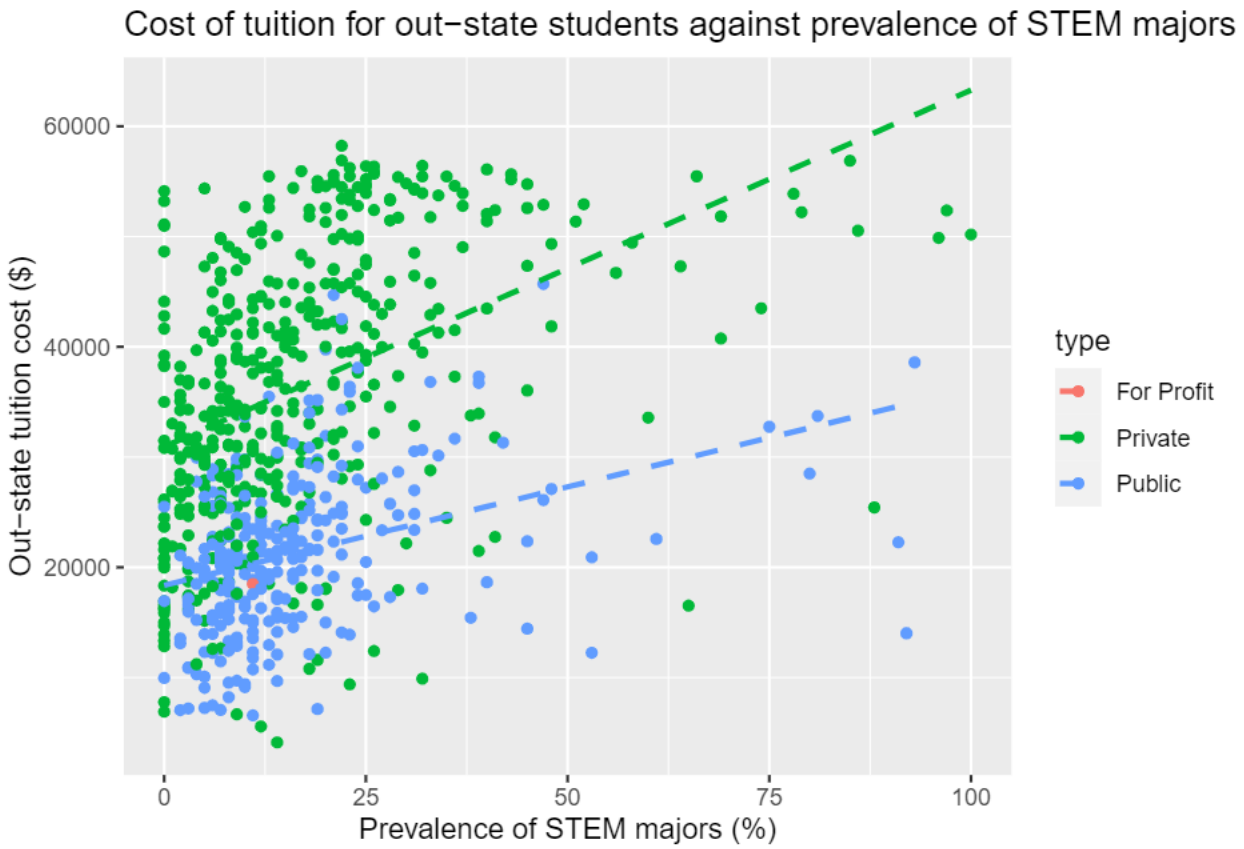
```
## `geom_smooth()` using formula 'y ~ x'
```



(This graph doesn't show what was seen first for your convenience, but I will be sure to remove the color for the presentation)

```
ggplot(tcFacJoinSp, aes(x=stem_percent,y=out_of_state_tuition,color=type)) +
  geom_point() +
  geom_smooth(method="lm",se=FALSE,lty=2) +
  ggtitle("Cost of tuition for out-state students against prevalence of STEM majors")+
  xlab("Prevalence of STEM majors (%)")+
  ylab("Out-state tuition cost ($)")
```

```
## `geom_smooth()` using formula 'y ~ x'
```




```
ISSPmodel=lm(in_state_tuition~stem_percent,data=tcFacJoinSp)
OSSPmodel=lm(out_of_state_tuition~stem_percent,data=tcFacJoinSp)

summary(ISSPmodel)
```

```
##
## Call:
## lm(formula = in_state_tuition ~ stem_percent, data = tcFacJoinSp)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -37716 -15270   1182  13232  32159
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  21958.94     854.44  25.700  < 2e-16 ***
## stem_percent   258.53      37.33   6.926 9.54e-12 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 15790 on 726 degrees of freedom
## Multiple R-squared:  0.06198,    Adjusted R-squared:  0.06069
## F-statistic: 47.97 on 1 and 726 DF,  p-value: 9.539e-12
```

```
summary(OSSPmodel)
```

```
##
## Call:
```

```
## lm(formula = out_of_state_tuition ~ stem_percent, data = tcFacJoinSp)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -38402  -8987  -1332   9183  28283
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  25835.03     656.62   39.34   <2e-16 ***
## stem_percent   289.00      28.69   10.07   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 12130 on 726 degrees of freedom
## Multiple R-squared:  0.1227, Adjusted R-squared:  0.1215
## F-statistic: 101.5 on 1 and 726 DF,  p-value: < 2.2e-16
```

In-state Slope: 258.53 Y-intercept: 21958.94

Out-of-state Slope: 289.00 Y-intercept: 25835.03

Notes for story-telling:

Hypothesis: stem_percent high => stem equipment high; cost++?

room and board not considered because r&b charged by a non-academic department, and stem is academic in-state plot revealed cluster out-of-state students do not generally enjoy benefits of tuition discounts at public universities

Hypothesis: public => less burden on student due to public/instate status => generally less tuition, but still guessing stem equipment drives up cost.

```
cor(tcFacJoinSp$in_state_total,tcFacJoinSp$stem_percent)
```

```
## [1] 0.2781892
```

```
#duh, cor doesn't care about the clusters.
```

```
tcFacJoinSpPUB = tcFacJoinSp %>%
  filter(type=="Public")
tcFacJoinSpPUB
```

```
## # A tibble: 276 x 17
##    name      state state~1 type  degre~2 room_~3 in_st~4 in_st~5 out_o~6 out_o~7
##    <chr>     <chr> <chr>   <chr> <chr>     <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
##  1 Adams St~ Colo~ CO      Publ~ 4 Year     8782    9440   18222   20456   29238
##  2 Alabama ~ Alab~ AL      Publ~ 4 Year     5422   11068   16490   19396   24818
##  3 Alcorn S~ Miss~ MS      Publ~ 4 Year     9608    7144   16752    7144   16752
##  4 Appalach~ Nort~ NC      Publ~ 4 Year     8304    7214   15518   22021   30325
##  5 Arkansas~ Arka~ AR      Publ~ 4 Year     7870    9068   16938   15848   23718
##  6 Armstron~ Geor~ GA      Publ~ 4 Year    11385    6384   17769   19866   31251
##  7 Athens S~ Alab~ AL      Publ~ 4 Year       NA    6810    6810   12870   12870
##  8 Auburn U~ Alab~ AL      Publ~ 4 Year    13332   11276   24608   30524   43856
##  9 Auburn U~ Alab~ AL      Publ~ 4 Year     6980   10288   17268   22048   29028
## 10 Augusta ~ Geor~ GA      Publ~ 4 Year     9640   10758   20398   29796   39436
## # ... with 266 more rows, 7 more variables: degFactor <fct>, rank <dbl>,
## #   state_name <chr>, early_career_pay <dbl>, mid_career_pay <dbl>,
## #   make_world_better_percent <dbl>, stem_percent <dbl>, and abbreviated
## #   variable names 1: state_code, 2: degree_length, 3: room_and_board,
```

```
## #   4: in_state_tuition, 5: in_state_total, 6: out_of_state_tuition,
## #   7: out_of_state_total
```

```
tcFacJoinSpPRIV = tcFacJoinSp %>%
  filter(type=="Private")
tcFacJoinSpPRIV
```

```
## # A tibble: 451 x 17
##    name      state state~1 type  degre~2 room_~3 in_st~4 in_st~5 out_o~6 out_o~7
##    <chr>     <chr> <chr>   <chr> <chr>     <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
##  1 Adventis~ Flor~ FL      Priv~ 4 Year     4200   15150   19350   15150   19350
##  2 Agnes Sc~ Geor~ GA      Priv~ 4 Year    12330   41160   53490   41160   53490
##  3 Alaska P~ Alas~ AK      Priv~ 4 Year     7300   20830   28130   20830   28130
##  4 Albany C~ New ~ NY      Priv~ 4 Year    10920   35105   46025   35105   46025
##  5 Albertus~ Conn~ CT      Priv~ 4 Year    13200   32060   45260   32060   45260
##  6 Albion C~ Mich~ MI      Priv~ 4 Year    12380   45775   58155   45775   58155
##  7 Allen Co~ Iowa  IA      Priv~ 4 Year     7282   19970   27252   19970   27252
##  8 Alma Col~ Mich~ MI      Priv~ 4 Year    10998   40258   51256   40258   51256
##  9 Amberton~ Texas TX      Priv~ 4 Year       NA   12840   12840   12840   12840
## 10 Amherst ~ Mass~ MA      Priv~ 4 Year    14740   56426   71166   56426   71166
## # ... with 441 more rows, 7 more variables: degFactor <fct>, rank <dbl>,
## #   state_name <chr>, early_career_pay <dbl>, mid_career_pay <dbl>,
## #   make_world_better_percent <dbl>, stem_percent <dbl>, and abbreviated
## #   variable names 1: state_code, 2: degree_length, 3: room_and_board,
## #   4: in_state_tuition, 5: in_state_total, 6: out_of_state_tuition,
## #   7: out_of_state_total
```

```
cor(tcFacJoinSpPRIV$in_state_tuition,tcFacJoinSpPRIV$stem_percent)
```

```
## [1] 0.4328422
```

```
cor(tcFacJoinSpPUB$in_state_tuition,tcFacJoinSpPUB$stem_percent)
```

```
## [1] 0.2654226
```

```
cor(tcFacJoinSpPRIV$out_of_state_tuition,tcFacJoinSpPRIV$stem_percent)
```

```
## [1] 0.4328422
```

```
cor(tcFacJoinSpPUB$out_of_state_tuition,tcFacJoinSpPUB$stem_percent)
```

```
## [1] 0.3564587
```

Moderately weak positive association between tuition cost and prevalence of stem majors at a school. But only MODERATELY! There still is some good correlation here. Other ideas?

Observation notes:

Correlations for both seem to be generally higher than that of the one taken before splitting.

Question: what is a stronger explanation for expensive schools? Are there other factors beyond funding STEM departments?

This dataset does not contain readily-usable data on ivy-league status or reputation. What if schools use their alumni's early career salary as a selling point to justify higher prices?