Thompson_Hendley_hw5

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```
## -- Attaching packages --------------------------- tidyverse 1.3.0 --
```

```
## v ggplot2 3.3.2     v purrr   0.3.4
## v tibble  3.0.3     v dplyr   1.0.2
## v tidyr   1.1.2     v stringr 1.4.0
## v readr   1.4.0     v forcats 0.5.0
```

```
## -- Conflicts ------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

1)

```
#code for question 1
```

2)

```
#need to figure out either why doesn't go back into for loop
#or why the rest of the columns are 0's
mgs <- function(A){
  #skeleton of Q and define ai = (a_i)
  Q <- matrix(0, nrow = nrow(A), ncol = ncol(A))
  ai <- A[, 1]

  #getting Q
  for(i in seq_along(ncol(Q))){
    Q[, i] <- normalize(ai)
    #checking for 0 cols
    if(norm(ai) != 0 & i != ncol(Q)){
      #redefining a_i
      for(j in (i+1):ncol(Q)){
        ai <- ai - project_onto(A[, j], Q[, i])
      }
    }
  }
  #return
  discard_zero_cols(Q)
}

#testing
A <- matrix(c(1, 6, 19, 2,1, 2,  7, 3,5, 6, 23, 2), nrow = 3, byrow = TRUE)
gs(A)
```

```
##           [,1]       [,2]       [,3]
## [1,] 0.1924501  0.9678053 -0.1622214
## [2,] 0.1924501  0.1248781  0.9733285
```

```
## [3,] 0.9622504 -0.2185367 -0.1622214
```

```
mgs(A)
```

```
## [1] 0.1924501 0.1924501 0.9622504
```

3)

```
#code for 3
```

4)

```
#code for 4
```