

in_class_pset4_Q13.R

a5creel

2024-11-05

```
# Goal: Go through set up for pset 4 Q13  
# Andie Creel / Started Nov 2024
```

```
# Problem set up: define the matrices A, B and b
```

```
A <- matrix(nrow = 2, ncol = 2, data = c(1, 2, 3, 2))  
A
```

```
##      [,1] [,2]  
## [1,]    1    3  
## [2,]    2    2
```

```
B <- matrix(nrow = 2, ncol = 4, data = c(1, 3, 1, 22, 1, 3, 1, 22))  
B
```

```
##      [,1] [,2] [,3] [,4]  
## [1,]    1    1    1    1  
## [2,]    3   22    3   22
```

```
b <- matrix(nrow = 2, ncol = 1, data = c(1, 3))  
b
```

```
##      [,1]  
## [1,]    1  
## [2,]    3
```

```
# Problem set up: define the matrices A, B and b
```

```
# function take takes 2 matrices and then returns their product
```

```
get_product <- function(my_A, my_B){  
  
  # check to see if conformable  
  if(ncol(my_A) != nrow(my_B)){  
    stop("not conformable matrices")  
  }  
  
  # initialized the output matrix  
  C <- matrix(nrow = nrow(my_A), ncol = ncol(my_B), data = 0)
```

```

C

# loop over rows of A
for (i in 1:nrow(my_A)) {

  # loop over columns B
  for (j in 1:ncol(my_B)){
    # print(paste(i, "", j))
    C[i, j] <- sum(my_A[i,] * my_B[,j])

  }

}

return(C)

}

C <- get_product(A,B)
C

```

```

##      [,1] [,2] [,3] [,4]
## [1,]   10   67   10   67
## [2,]    8   46    8   46

```

```
A%*%B
```

```

##      [,1] [,2] [,3] [,4]
## [1,]   10   67   10   67
## [2,]    8   46    8   46

```

```

D <- get_product(A, b)
D

```

```

##      [,1]
## [1,]   10
## [2,]    8

```

```
A%*%b
```

```

##      [,1]
## [1,]   10
## [2,]    8

```

```

# Part B: Solve the equation Ax = b to find x
# x = A^{-1}%*%b

```

```

A_inverse <- solve(A)

x <- A_inverse %*% b
x

```

```
##      [,1]  
## [1,]  1.75  
## [2,] -0.25
```

```
x_2 <- solve(A,b)  
x_2
```

```
##      [,1]  
## [1,]  1.75  
## [2,] -0.25
```

```
??solve()
```