Ex5

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## OOP-S4

1. Design a class that holds the following personal data: name, address, age, and phone number. Write appropriate accessor functions (getters and setters). Then, write a program that creates three instances of the class. One instance should hold your information, and the other two should hold your friends’ or family members’ information.

# Define the Person class  
Person <- function(name, address, age, phone\_number) {  
 person <- list(  
 name = name,  
 address = address,  
 age = age,  
 phone\_number = phone\_number  
 )  
 class(person) <- "Person"  
   
 # Define accessor functions (getters and setters)  
 getName <- function() {  
 return(person$name)  
 }  
   
 setName <- function(new\_name) {  
 person$name <- new\_name  
 }  
   
 getAddress <- function() {  
 return(person$address)  
 }  
   
 setAddress <- function(new\_address) {  
 person$address <- new\_address  
 }  
   
 getAge <- function() {  
 return(person$age)  
 }  
   
 setAge <- function(new\_age) {  
 person$age <- new\_age  
 }  
   
 getPhoneNumber <- function() {  
 return(person$phone\_number)  
 }  
   
 setPhoneNumber <- function(new\_phone\_number) {  
 person$phone\_number <- new\_phone\_number  
 }  
   
 # Return the object with accessor methods  
 return(list(  
 person = person,  
 getName = getName,  
 setName = setName,  
 getAddress = getAddress,  
 setAddress = setAddress,  
 getAge = getAge,  
 setAge = setAge,  
 getPhoneNumber = getPhoneNumber,  
 setPhoneNumber = setPhoneNumber  
 ))  
}  
  
# Create instances of the class  
person1 <- Person("HariKrishna", "310 S Kendall", 25, "7288871888")  
person2 <- Person("Krishna Hari", "310 S KendallRoomate2", 30, "2699981599")  
person3 <- Person("Krishna Reddy", "310 S KendallRoomate3", 30, "269-998-1599")  
  
# Test accessor functions  
print(person1$getName())

## [1] "HariKrishna"

person2$setAge(31)  
print(person2$getAge())

## [1] 30

# Print the information of each person  
print(person1$person)

## $name  
## [1] "HariKrishna"  
##   
## $address  
## [1] "310 S Kendall"  
##   
## $age  
## [1] 25  
##   
## $phone\_number  
## [1] "7288871888"  
##   
## attr(,"class")  
## [1] "Person"

print(person2$person)

## $name  
## [1] "Krishna Hari"  
##   
## $address  
## [1] "310 S KendallRoomate2"  
##   
## $age  
## [1] 30  
##   
## $phone\_number  
## [1] "2699981599"  
##   
## attr(,"class")  
## [1] "Person"

print(person3$person)

## $name  
## [1] "Krishna Reddy"  
##   
## $address  
## [1] "310 S KendallRoomate3"  
##   
## $age  
## [1] 30  
##   
## $phone\_number  
## [1] "269-998-1599"  
##   
## attr(,"class")  
## [1] "Person"

## OOP-R6

1. Write a class named Person with data fields for a person’s name, address, and telephone number. Next, write a class named Customer that is a subclass of the Person class. The Customer class has a data field for a customer id [private access], and a Boolean data field indicating whether the customer wishes to be on a mailing list. Demonstrate an instance of the Customer class in a simple program. Also, Demonstrate the distinction between public and private fields in the Customer class in a simple statement.

# Define the Person class  
Person <- function(name, address, phone\_number) {  
 person <- list(  
 name = name,  
 address = address,  
 phone\_number = phone\_number  
 )  
 class(person) <- "Person"  
 return(person)  
}  
  
# Define accessor functions (getters and setters) for Person class  
getName <- function(person) {  
 return(person$name)  
}  
  
setName <- function(person, name) {  
 person$name <- name  
}  
  
getAddress <- function(person) {  
 return(person$address)  
}  
  
setAddress <- function(person, address) {  
 person$address <- address  
}  
  
getPhoneNumber <- function(person) {  
 return(person$phone\_number)  
}  
  
setPhoneNumber <- function(person, phone\_number) {  
 person$phone\_number <- phone\_number  
}  
  
# Define the Customer class as a subclass of Person  
Customer <- function(name, address, phone\_number, customer\_id, on\_mailing\_list = FALSE) {  
 customer <- list(  
 name = name,  
 address = address,  
 phone\_number = phone\_number,  
 customer\_id = customer\_id,  
 on\_mailing\_list = on\_mailing\_list  
 )  
 class(customer) <- c("Customer", "Person")  
 return(customer)  
}  
  
# Define accessor functions (getters and setters) for Customer class  
getCustomerID <- function(customer) {  
 return(customer$customer\_id)  
}  
  
setCustomerID <- function(customer, customer\_id) {  
 customer$customer\_id <- customer\_id  
}  
  
getMailingListStatus <- function(customer) {  
 return(customer$on\_mailing\_list)  
}  
  
setMailingListStatus <- function(customer, status) {  
 customer$on\_mailing\_list <- status  
}  
  
# Create an instance of the Customer class  
customer1 <- Customer("HariKrishna", "310 S Kendall", "7288871888","CUST69", TRUE)  
  
# Test accessor functions for Customer class  
getCustomerID(customer1) # Output: "C12345"

## [1] "CUST69"

getMailingListStatus(customer1) # Output: TRUE

## [1] TRUE

print(customer1$on\_mailing\_list)

## [1] TRUE