Tut5_memo

Dr. Niladri Chakraborty

2023-05-08

Write a code for the following problems:

1. Write a function calculate_tip() that calculates the tip amount based on a bill amount and a tip percentage. The function should take two arguments: bill_amount (a numeric value) and tip_percent (a numeric value between 0 and 100). The function should return the tip amount as a numeric value.

```
calculate_tip <- function(bill_amount, tip_percent) {
  tip <- bill_amount * tip_percent / 100
  return(tip)
}
```

2. Write a function find_missing_numbers() that takes a vector of consecutive integers (in any order) and returns a vector of the missing numbers. For example, if the input vector is c(1, 4, 3, 6, 7), the function should return c(2, 5).

```
find_missing_numbers <- function(nums) {
  complete_seq <- seq(min(nums), max(nums))
  missing_nums <- setdiff(complete_seq, nums)
  return(missing_nums)
}
```

3. Write a function calculate_salary() that calculates the monthly salary of an employee based on their hourly wage and the number of hours worked per week. The function should take two arguments: hourly_wage (a numeric value) and hours_worked (a numeric value between 0 and 168). The function should assume that the employee works 4 weeks in a month and calculate the monthly salary as a numeric value.

```
calculate_salary <- function(hourly_wage, hours_worked) {
  monthly_salary <- hourly_wage * hours_worked * 4
  return(monthly_salary)
}
```

4. Write a function find_mode() that takes a numeric vector as input and returns the mode of the vector (i.e., the most common value). If there are multiple modes, the function should return all of them.

```
find_mode <- function(nums) {
  freq_table <- table(nums)
  max_freq <- max(freq_table)
  mode <- names(freq_table[freq_table == max_freq])
  return(mode)
}
```

5. Write a function calculate_profit() that takes a data frame with columns for revenue and expenses as input and calculates the profit for each row. The function should also create a new column called "profit_margin" that calculates the profit margin as a percentage of the revenue. The function should return the modified data frame. For example, if the input data frame is:

	revenue	expenses
1	1000	600
2	2000	1200
3	3000	1800

The function should return:

	revenue	expenses	profit	profit_margin
1	1000	600	400	40
2	2000	1200	800	40
3	3000	1800	1200	40

Note that profit is calculated as revenue minus expenses, and profit margin is calculated as (profit / revenue) * 100%. The function should handle missing or invalid values appropriately.

```
calculate_profit_margin <- function(revenue, cost) {

  profit <- revenue - cost

  profit_margin <- profit/revenue

  return(c(profit,profit_margin))

}

# Test the function

profit_margin <- calculate_profit_margin(500, 300)

print(profit_margin)
```