Python Assessment: Monthly Bill Generator

Objective

Given a predefined `item_list`, write a function that, for a given month and year (e.g., `"2024-11"`), generates a bill by calculating charges for active items and grouping them appropriately.

☑ Function Signature

def generate_monthly_bill(item_list: list, target_month: str) -> dict:

    """

    Generates a bill for the given month based on the item list.

    Parameters:

        item_list (list): List of dictionaries with item details.

        target_month (str): Month in "YYYY-MM" format (e.g., "2024-11").

    Returns:

        dict: A dictionary with grouped line items and total revenue.

    """

 Requirements

1. Active Item Detection

  - Include only items whose date range intersects with the selected month.

2. Grouping Logic

  - Group items if the following fields match:

    - `item_code`

    - `rate`

    - Billing Period (intersection of item's start/stop and selected month)

3. Amount Calculation

- Calculate the billable amount for each item based on its active days in the selected month.

4. Total Revenue

  - The total revenue should be the sum of all grouped amounts.

📑 Output Format

```
{
 "line_items": [
  {
   "item_code": "Executive Desk (4*2)",
   "rate": 1080.0,
   "qty": 25,
   "amount": 27000.0,
   "billing_period": "2024-11-01 to 2024-11-30"
  },
  ...
 ],
 "total_revenue": 72000.0
}
```

🔲 Hints

- Be mindful of inconsistent data types in fields like `rate`, `qty`, and `amount`.

- Pay close attention to how many days in the month an item is active.

item_list = [

```
{
    "idx": 1,
    "item_code": "Executive Desk (4*2)",
    "sales_description": "Dedicated Executive Desk",
    "qty": 10,
    "rate": "1000",
    "amount": "10000",
    "start_date": "2023-11-01",
    "stop_date": "2024-10-17",
},
{
    "idx": 2,
    "item_code": "Executive Desk (4*2)",
    "qty": "10",
    "rate": "1080",
    "amount": "10800",
    "start_date": "2024-10-18",
    "stop_date": "2025-10-31",
},
{
    "idx": 3,
    "item_code": "Executive Desk (4*2)",
    "qty": 15,
    "rate": "1080",
    "amount": "16200",
    "start_date": "2024-11-01",
    "stop_date": "2025-10-31",
},
{
    "idx": 4,
```

```json
    "item_code": "Executive Desk (4*2)",

    "qty": 5,

    "rate": "1000",

    "amount": "5000",

    "start_date": "2024-11-01",

    "stop_date": "2025-10-31",

},

{

    "idx": 5,

    "item_code": "Manager Cabin",

    "qty": 5,

    "rate": 5000,

    "amount": 25000,

    "start_date": "2024-11-01",

    "stop_date": "2025-10-31",

},

{

    "idx": 6,

    "item_code": "Manager Cabin",

    "qty": 7,

    "rate": "5000",

    "amount": 35000,

    "start_date": "2024-12-15",

    "stop_date": "2025-10-31",

},

{

    "idx": 7,

    "item_code": "Manager Cabin",

    "qty": 10,

    "rate": 4600,

    "amount": 46000,
```

```json
    "start_date": "2023-11-01",
    "stop_date": "2024-10-17",
  },
  {
    "idx": 8,
    "item_code": "Parking (2S)",
    "qty": 10,
    "rate": 1000,
    "amount": 10000,
    "start_date": "2024-11-01",
    "stop_date": "2025-10-31",
  },
  {
    "idx": 9,
    "item_code": "Parking (2S)",
    "qty": 10,
    "rate": 0,
    "amount": 0,
    "start_date": "2024-11-01",
    "stop_date": "2025-10-31",
  },
  {
    "idx": 10,
    "item_code": "Executive Desk (4*2)",
    "qty": "8",
    "rate": "1100",
    "amount": "8800",
    "start_date": "2024-11-15",
    "stop_date": "2025-01-31",
  },
  {
```

    "idx": 11,

    "item_code": "Manager Cabin",

    "qty": "3",

    "rate": "5200",

    "amount": "15600",

    "start_date": "2024-10-10",

    "stop_date": "2024-11-10",

},

{

    "idx": 12,

    "item_code": "Conference Table",

    "qty": 1,

    "rate": "20000",

    "amount": "20000",

    "start_date": "2024-11-05",

    "stop_date": "2024-11-20",

},

{

    "idx": 13,

    "item_code": "Parking (2S)",

    "qty": 5,

    "rate": "1000",

    "amount": "5000",

    "start_date": "2024-11-15",

    "stop_date": "2025-02-28",

},

{

    "idx": 14,

    "item_code": "Reception Desk",

    "qty": 2,

    "rate": "7000",

```json
      "amount": "14000",

      "start_date": "2024-11-01",

      "stop_date": "2025-03-31",

    },

    {

      "idx": 15,

      "item_code": "Reception Desk",

      "qty": 1,

      "rate": "7000",

      "amount": "7000",

      "start_date": "2024-11-10",

      "stop_date": "2024-11-25",

    },

    {

      "idx": 16,

      "item_code": "Breakout Area",

      "qty": 3,

      "rate": "3000",

      "amount": "9000",

      "start_date": "2024-01-01",

      "stop_date": "2024-01-31",

    }

]
```