

Sets and availability

Step 1

Reformat *plannedequipment* into *reservations per date*

Processes equipment reservation data.

- Reads **reservation** records from JSON files in the "**plannedequipment**" directory.
- Reads **equipment properties** from JSON files in the "**equipment**" directory.

Calculates daily reservation totals for each equipment item.

- Covers a date range: current month plus a configurable number of months (default 9).
- Organizes data into a nested structure: year → month → day.

Computes daily available quantity: current quantity minus reservations.

Outputs results to JSON files in the "**reservationperdate**" directory.

Offers optional features:

- Suppression of days with zero reservations.
- Prevention of file creation when no reservation data exists.

Script

```
# createReservationperdatev2.py

import os
import json
from datetime import datetime, date, timedelta
import calendar

# Parameters
SUPPRESS_ZERO = True      # If True, skip storing day nodes with zero reservations.
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SUPPRESS_EMPTY_FILE = True    # If True, do not create an output file if the "dates" part is empty.
ADDITIONAL_MONTHS = 9        # Number of additional months to process (beyond the current month)

# Define the directories
plannedequipment_dir = 'plannedequipment'
equipment_dir = 'equipment'
output_dir = 'reservationperdate'
os.makedirs(output_dir, exist_ok=True)

# Define the date range: from the first day of this month to the last day of the month ADDITIONAL_MONTHS
later.
today = date.today()
start_date = date(today.year, today.month, 1)
end_month = today.month + ADDITIONAL_MONTHS
end_year = today.year + (end_month - 1) // 12
end_month = ((end_month - 1) % 12) + 1
last_day = calendar.monthrange(end_year, end_month)[1]
end_date = date(end_year, end_month, last_day)

# Define the list of equipment property keys to copy from the equipment JSON files.
equipment_keys = ["is_combination", "is_physical", "current_quantity"]

def add_day(nested_dates, current_date):
    """Ensure that nested_dates[year][month][day] exists and initialize it."""
    year = str(current_date.year)
    month = f"{current_date.month:02d}"
    day = f"{current_date.day:02d}"

    if year not in nested_dates:
        nested_dates[year] = {}
    if month not in nested_dates[year]:
        nested_dates[year][month] = {}
    if day not in nested_dates[year][month]:
        nested_dates[year][month][day] = {"reservations": 0, "available": None}

def remove_empty_containers(nested_dates):
    """Remove empty month and year nodes if they have no day entries."""
    years_to_remove = []
    for year, months in nested_dates.items():

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months_to_remove = []
for month, days in months.items():
    if not days: # If month dictionary is empty
        months_to_remove.append(month)
for month in months_to_remove:
    del nested_dates[year][month]
if not nested_dates[year]:
    years_to_remove.append(year)
for year in years_to_remove:
    del nested_dates[year]

# Process each JSON file in the plannedequipment directory.
for filename in os.listdir(plannedequipment_dir):
    if not filename.endswith('.json'):
        continue

    # Build full paths for plannedequipment, equipment and output files.
    plan_file_path = os.path.join(plannedequipment_dir, filename)
    equipment_file_path = os.path.join(equipment_dir, filename)
    output_path = os.path.join(output_dir, filename)

    # Load the reservation data from the plannedequipment file.
    with open(plan_file_path, 'r', encoding='utf-8') as infile:
        plan_data = json.load(infile)

    # Initialize the nested dates dictionary.
    nested_dates = {}
    current_date = start_date
    while current_date <= end_date:
        add_day(nested_dates, current_date)
        current_date += timedelta(days=1)

    # Process each reservation record.
    for record in plan_data.get('data', []):
        start_str = record.get('planperiod_start')
        end_str = record.get('planperiod_end')
        if not start_str or not end_str:
            continue

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record_start = datetime.fromisoformat(start_str).date()
record_end = datetime.fromisoformat(end_str).date()
# Clamp the reservation period to our target range.
period_start = max(record_start, start_date)
period_end = min(record_end, end_date)
if period_start > period_end:
    continue

quantity = record.get('quantity', 0)
current = period_start
while current <= period_end:
    year = str(current.year)
    month = f"{current.month:02d}"
    day = f"{current.day:02d}"
    if year in nested_dates and month in nested_dates[year] and day in nested_dates[year][month]:
        nested_dates[year][month][day]["reservations"] += quantity
    current += timedelta(days=1)

# Initialize equipment properties.
item_properties = {}
current_quantity = 0

# Read the corresponding equipment file.
if os.path.exists(equipment_file_path):
    with open(equipment_file_path, 'r', encoding='utf-8') as eq_file:
        equipment_data = json.load(eq_file)
        equipment_item = equipment_data.get('data', {})
        # Copy the desired properties.
        for key in equipment_keys:
            item_properties[key] = equipment_item.get(key, None)
        current_quantity = equipment_item.get('current_quantity', 0)
else:
    print(f"Error: Equipment file '{filename}' not found in '{equipment_dir}'. Assuming current_quantity = 0
and default item properties.")
    for key in equipment_keys:
        item_properties[key] = None

# Update each day with the available quantity and optionally suppress days with zero reservations.
for year in list(nested_dates.keys()):

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for month in list(nested_dates[year].keys()):
    for day in list(nested_dates[year][month].keys()):
        day_data = nested_dates[year][month][day]
        reservations = day_data["reservations"]
        day_data["available"] = current_quantity - reservations
        if SUPPRESS_ZERO and reservations == 0:
            del nested_dates[year][month][day]
        # If a month becomes empty after removing days, remove the month.
    if not nested_dates[year][month]:
        del nested_dates[year][month]
# If a year becomes empty after removing months, remove the year.
if not nested_dates[year]:
    del nested_dates[year]

# If SUPPRESS_EMPTY_FILE is True and the nested dates dictionary is empty,
# remove the output file if it exists and skip writing.
if SUPPRESS_EMPTY_FILE and not nested_dates:
    if os.path.exists(output_path):
        os.remove(output_path)
        print(f"Removed existing file {output_path} because there are no reservations.")
    continue

# Combine the item properties and the nested date reservation data.
output_data = {
    "item": item_properties,
    "dates": nested_dates
}

# Write the result to the output directory.
with open(output_path, 'w', encoding='utf-8') as outfile:
    json.dump(output_data, outfile, indent=2)

print("Reservation, availability, and item data have been processed and saved.")

```

Step 2

Download the set hierarchy from the API

(takes long, build in delays to prevent throttling)

```

# getSets.py

import json
import time
import requests
import sys

# Configuration variables (adjust these as needed)
BASE_URL = "https://api.rentman.net/" # Replace with your actual base URL

FILTER_ON_TAGS = False # Set to True if you want to apply tag filtering
API_TOKEN = "abc" # Replace with your actual API token

def log_message(message, force=False):
    """Logs a message. You can modify this to log to a file if needed."""
    sys.stderr.write(message + "\n")
    if force:
        print(message)

def count_api_usage():
    """Stub function for counting API usage."""
    # Extend this function to track API usage if needed.
    pass

def filter_array_by_selections(items, selections):
    """
    Filters an array of dictionaries based on the presence of certain keys with truthy values.

    :param items: List of dictionaries to filter.
    :param selections: List of keys to check.
    :return: Filtered list of dictionaries.
    """
    filtered = []
    for item in items:
        for sel in selections:
            if item.get(sel):
                filtered.append(item)
                break
    return filtered

```

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def make_request(method, endpoint, data=None):
    """
    Makes an HTTP request using the requests library.

    :param method: HTTP method ('GET' or 'POST').
    :param endpoint: API endpoint (appended to BASE_URL).
    :param data: Dictionary of data or query parameters.
    :return: Parsed JSON response or None if error occurs.
    """
    if data is None:
        data = {}

    url = BASE_URL + endpoint
    headers = {
        "Authorization": f"Bearer {API_TOKEN}",
        "Content-Type": "application/json"
    }

    try:
        if method.upper() == 'POST':
            response = requests.post(url, headers=headers, json=data)
        elif method.upper() == 'GET':
            response = requests.get(url, headers=headers, params=data)
        else:
            log_message(f"Unsupported HTTP method: {method}")
            return None
    except requests.RequestException as e:
        log_message(f"Request exception: {e}")
        return None

    if not response.ok:
        log_message(f"HTTP error: {response.status_code} | Response Body: {response.text}")
    try:
        return response.json()
    except json.JSONDecodeError:
        log_message("Error decoding JSON response.")
        return None

```

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def get_request(endpoint, params=None):
    """
    Performs a GET request and counts API usage.

    :param endpoint: API endpoint.
    :param params: Query parameters as a dictionary.
    :return: Parsed JSON response.
    """
    count_api_usage()
    return make_request('GET', endpoint, params)

def equipmentsetscontent(filter_on_tags=FILTER_ON_TAGS):
    """
    Retrieves equipment sets content by fetching data in batches.

    :param filter_on_tags: If True, applies tag filtering.
    :return: Complete list of items.
    """
    all_items = []
    offset = 0
    batch_size = 300
    total_fetched = 0

    while True:
        params = {'offset': offset, 'limit': batch_size}
        response = get_request('equipmentsetscontent', params)

        if not response or 'data' not in response:
            print("<pre><h1>Error in API Request</h1>")
            print(response)
            sys.exit(1)

        items = response['data']
        all_items.extend(items)
        total_fetched += len(items)

        # If fewer than batch_size items are returned, no more records are available.
        if len(items) < batch_size:
            break

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offset += batch_size

# If 3000 records have been fetched, pause for 1 second to avoid rate limits.
if total_fetched >= 3000:
    log_message("Pausing for 1 second to avoid rate limits...", True)
    time.sleep(1)
    total_fetched = 0 # Reset the counter after the pause

if filter_on_tags:
    all_items = filter_array_by_selections(all_items, ['hoofditem', 'set'])

return all_items

# Main execution
if __name__ == "__main__":
    complete_data = equipmentsetscontent()
    print(json.dumps(complete_data, indent=4))

```

Step 3,

Convert the output from step 2 into sets-childs format (parent with list of childs).

For each entry, the script removes the "/equipment/" prefix from both the parent and child equipment values using the helper function.

For every entry, after stripping the prefixes, a new dictionary is created for the child item (containing the stripped child equipment and its quantity). This child dictionary is then appended to the list associated with the corresponding parent key in the dictionary.

Once all entries are processed, the dictionary keys (i.e., the parent equipment numbers) are sorted in ascending order to organize the final output.

Prompt

Write a Python script that performs the following tasks:

- Define variables at the top of the script for an input file and an output file. The input file is "sets/sets.json" and the output file is "sets/sets-childs.json".

- Read the JSON data from the input file. The file contains a list of objects, each with fields such as "parent_equipment", "equipment", and "quantity". The "parent_equipment" and "equipment" fields are strings that start with the prefix "/equipment/".
- Create a helper function to remove the "/equipment/" prefix from these strings.
- Group the objects by the numeric part of the parent equipment (after stripping the prefix). For each group, store a list of child items, where each child is represented by a dictionary containing the stripped "equipment" number and its "quantity".
- Sort the groups by their parent equipment keys in ascending numerical order.
- Write the resulting grouped and sorted data to the output file in JSON format with proper indentation.
- Please generate the complete Python code to achieve this.

```
# set-combined.py

import json
from collections import defaultdict

# Define file paths
input_file = "sets/sets.json"
output_file = "sets/sets-childs.json"

def strip_prefix(equipment_str):
    prefix = "/equipment/"
    return equipment_str[len(prefix):] if equipment_str.startswith(prefix) else equipment_str

# Load the input JSON file
with open(input_file, "r") as infile:
    data = json.load(infile)

# Group child items by parent equipment (after stripping the prefix)
sets_dict = defaultdict(list)
for entry in data:
    parent = strip_prefix(entry["parent_equipment"])
    child_item = {
        "equipment": strip_prefix(entry["equipment"]),
        "quantity": entry["quantity"]
    }
    sets_dict[parent].append(child_item)
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# Sort the dictionary by parent keys in ascending numerical order
sorted_sets_dict = {k: sets_dict[k] for k in sorted(sets_dict.keys(), key=lambda x: int(x))}

# Write the output JSON file with sorted parent keys
with open(output_file, "w") as outfile:
    json.dump(sorted_sets_dict, outfile, indent=4)

print("The new JSON file has been created successfully.")
```

Step 4

Calculate set availability into reservationperdate-sets folder.

Prompt: [prompt to create set reservations.docx](#)

```
#!/usr/bin/env python3
# setReservationperdate.py

import os
import json
import math
from collections import defaultdict

# Directories for input and output files
SETS_FILE = os.path.join("sets", "sets-childs.json")
RESERVATION_DIR = "reservationperdate"
OUTPUT_DIR = "reservationperdate-sets"

# Ensure output directory exists
os.makedirs(OUTPUT_DIR, exist_ok=True)

def load_json(filepath):
    with open(filepath, "r") as f:
        return json.load(f)

def get_child_reservation(child_id):
```

```

"""
Given a child equipment id, load its reservation file.
Assumes filename is child_id + ".json" in the RESERVATION_DIR.
Returns a dict with keys "item" and optionally "dates".
"""
filepath = os.path.join(RESERVATION_DIR, f"{child_id}.json")
if os.path.exists(filepath):
    return load_json(filepath)
else:
    raise FileNotFoundError(f"Reservation file for equipment {child_id} not found at {filepath}")

def extract_date_availability(reservation):
    """
    Extract a mapping from (year, month, day) tuple to available quantity.
    If a reservation file has no "dates" node, returns an empty dict.
    """
    date_avail = {}
    dates = reservation.get("dates", {})
    for year, months in dates.items():
        for month, days in months.items():
            for day, data in days.items():
                date_avail[(year, month, day)] = data.get("available", 0)
    return date_avail

def nested_date_structure(date_dict):
    """
    Given a mapping with keys (year, month, day) and value (availability),
    build a nested dictionary: year -> month -> day -> {reservations: 0, available: value}
    """
    nested = defaultdict(lambda: defaultdict(dict))
    for (year, month, day), avail in date_dict.items():
        nested[year][month][day] = {"reservations": 0, "available": avail}
    return {year: dict(months) for year, months in nested.items()}

def main():
    # Load the sets definitions
    sets_def = load_json(SETS_FILE)

    # Process each set defined in sets-childs.json

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for set_id, children in sets_def.items():
    child_infos = [] # List of tuples: (child_id, required_quantity, full_stock, date_availability mapping)
    for child in children:
        child_id = child["equipment"]
        req_qty = child["quantity"]
        try:
            reservation = get_child_reservation(child_id)
        except FileNotFoundError as e:
            print(e)
            continue # Skip this child if its reservation file is missing
        full_stock = reservation.get("item", {}).get("current_quantity", 0)
        date_avail = extract_date_availability(reservation)
        child_infos.append((child_id, req_qty, full_stock, date_avail))

# Calculate the full availability (without date restrictions)
available_sets_full = math.inf
for (_, req_qty, full_stock, _) in child_infos:
    child_full_sets = full_stock // req_qty
    available_sets_full = min(available_sets_full, child_full_sets)
if available_sets_full == math.inf:
    available_sets_full = 0

# Gather the union of all dates from the children
union_dates = set()
for (_, _, full_stock, date_avail) in child_infos:
    union_dates.update(date_avail.keys())

# Compute availability per date from the union of dates
date_results = {}
for date in union_dates:
    avail_for_date = math.inf
    for (_, req_qty, full_stock, date_avail) in child_infos:
        # Use date-specific available if provided, otherwise use full stock
        child_avail = date_avail.get(date, full_stock)
        child_sets = child_avail // req_qty
        avail_for_date = min(avail_for_date, child_sets)
    date_results[date] = avail_for_date

# Only include dates where the available set count is lower than full availability

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filtered_dates = {date: avail for date, avail in date_results.items() if avail < available_sets_full}

# Build output JSON structure following the reservation file structure
output = {}
output["item"] = {
    "is_combination": True,
    "current_quantity": available_sets_full
}
if filtered_dates:
    output["dates"] = nested_date_structure(filtered_dates)

# Write the output JSON file for the set to the OUTPUT_DIR
out_filepath = os.path.join(OUTPUT_DIR, f"{set_id}.json")
with open(out_filepath, "w") as outfile:
    json.dump(output, outfile, indent=4)
print(f"Set {set_id}: full availability {available_sets_full} written to {out_filepath}")

if __name__ == "__main__":
    main()

```

Open issues

1. At the moment we only read and cache equipment belonging to a client. Set can consist out of items not belonging to any client directly, so there is no data available (in equipment). This means that there's no data for the availability in the cache. This would mean that we need to load and cach more equipment and more plannedequipment.

These are appr. 1000 equipments (current number is 1200).

2. The calendar format for each month is:

```

Array ( [1] => 1 [2] => 1 [3] => 1 [4] => 1 [5] => 1 [6] => 1 [7] => 1 [8] => 1 [9] => 1 [10] =>
1 [11] => 1 [12] => 1 [13] => 1 [14] => 1 [15] => 1 [16] => 1 [17] => 1 [18] => 1 [19] => 1
[20] => 1 [21] => 1 [22] => 1 [23] => 1 [24] => 1 [25] => 1 [26] => 1 [27] => 1 [28] => 1 [29]
=> 1 [30] => 1 )

```

Revision #8

Created 29 March 2025 18:15:40 by Max

Updated 30 March 2025 10:16:10 by Max