

Why use this webpage?

Our website offers an innovative framework specifically designed for the effective and efficient description and simulation of routines. Through our intuitive and user-friendly environment, users can:

- **Design custom routines:** Enables users to easily describe complex routines through an interface where you build daily routines writing the time slots and physical location for each interval
- **Simulate in a realistic way routines:** You can obtain a simulation of a routine by means of a labelmap, which consists of a file where, for each day, there are 1140 location annotations, one for each minute of the day.
- **Analyze and visualize the described routine:** You can modify in a user-friendly way a randomness parameter, used to achieve more realism in the location time intervals. Also, you can visualize in real time what is the result of the labelmap and, if you are satisfied, download the corresponding routine simulation

You have a complete video demo at the following link:

<https://youtu.be/rur1-0Pibx0>

Quick navigation guide

Welcome to our interactive platform, where simplicity meets functionality. Our website is crafted to ensure that you have a seamless experience while navigating through the various sections. Here's a guide to help you navigate our website:

Header and Footer Navigation

Across all pages of the website, you will find a consistent navigation structure both at the top (header) and at the bottom (footer) of the page. This includes:

a) Introduction: This is the welcome page, where you begin your journey. It gives you an overview of what the platform is about and how it can benefit you.

b) Routine Definition: Here is where you interactively define your routines. It's a user-friendly interface designed to make the process as intuitive as possible.

c) Routine Simulation: After defining your routines, you move on to this section to obtain the simulation file. Our sophisticated algorithm will simulate the routines based on the definitions you provided.

d) User Guide: Lastly, we have a comprehensive user guide available for you. It is recommended to read this guide to familiarize yourself with all the features and functionalities of our platform.

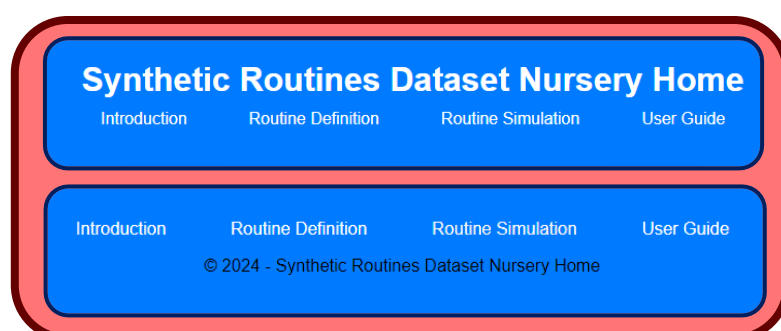


Figure 1 Header and footer navigation

Welcome Page Navigation

On the Introduction page, you will encounter three key elements that facilitate direct navigation to other parts of the website:



Figure 2 Navigation elements in the introduction page

- **Routine Definition:** By clicking on this element, you will be redirected to the section where you can begin creating and defining your routines interactively.
- **Routine Simulation:** Selecting this element will take you to the page where you can generate simulation files from the routines you have defined, providing a visual and data-driven outlook on your routines.
- **User Guide:** Clicking on this will open up the user guide, a document designed to help you understand and navigate the platform efficiently.

Each of these elements is visually represented on the Introduction page (as seen in the attached image) and acts as a gateway to the respective sections, ensuring that you have a direct and hassle-free route to the tools you need.

Routine Definition

Introduction to Routine Definition

The Routine Definition section of our website is a crucial component where you lay the groundwork for your simulation study. It is meticulously designed to be user-centric, facilitating the creation of detailed and precise routine schedules that reflect real-world scenarios. This section is divided into three distinct parts, each with its own purpose and functionality:

Part One: Room Selection for the Study

The first step in defining your routine is the selection of rooms. This foundational part allows you to tailor the environment to your specific study by choosing the spaces that will be included. Whether you are looking at a residential, office, or any other setting, you can customize the room selection to match the exact layout of the environment you are analyzing.

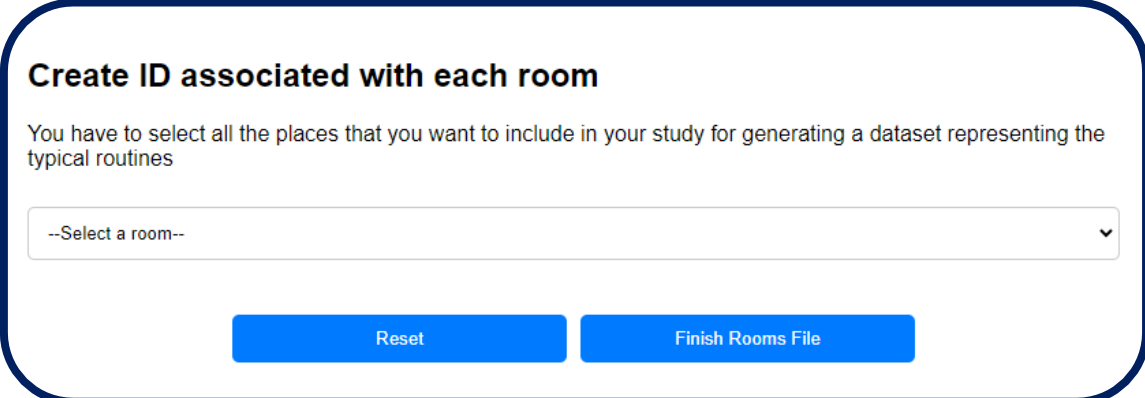
The image shows a user interface for room selection. It features a title 'Create ID associated with each room' in bold. Below the title is a descriptive text: 'You have to select all the places that you want to include in your study for generating a dataset representing the typical routines'. Underneath this text is a dropdown menu with the placeholder text '--Select a room--' and a downward arrow icon. At the bottom of the interface are two blue buttons: 'Reset' and 'Finish Rooms File'.

Figure 3 Visualization of the room selection section

The initial stage of defining your routine involves the crucial step of room selection, which sets the stage for the activities you will later simulate. The interface for this part, as shown in the attached image, is designed to be straightforward and user-friendly.

Selecting Rooms

At the heart of this section is a dropdown list that displays all available rooms. Here's how you can interact with it:

--Select a room--

--Select a room--

Room
Kitchen
Corridors
Bathroom
Bedroom
Living Room
TV Room
Dining Room
Garage
Garden
Pool
Terrace
Therapy Room
Gym

Figure 4 Dropdown of rooms

- **Selecting a Room:** Click on the dropdown menu labeled "--Select a room--" to view the list of available rooms. As you select a room, it will be removed from the dropdown list to avoid duplication and ensure each room is unique to your study.
- **Table of Selected Rooms:** Upon selection, a table will automatically generate and expand, listing all the rooms you have chosen. This visual representation allows you to review and confirm that the correct rooms are being included in your study.

Tabla Interactiva

Room	ID-Room
room	1
tv-room	2
terrace	3
therapy	4
gym	5
living-room	6
dining-room	7
corridors	8
garden	9

Figure 5 Autofilled table with selected rooms

Managing Your Selection

To give you control over this process, two buttons are provided:

Reset Button: If at any point you wish to start over or correct an error in the selection process, the 'Reset' button allows you to clear all selected rooms.

This will refresh your list, and all rooms will reappear in the dropdown menu for you to begin the selection process again.

Finish Rooms File Button: After you have completed your selection, the 'Finish Rooms File' button is used to conclude this part of the process. Clicking this will finalize your choices and it will redirect you to the next section.

Reset

Finish Rooms File

Part Two: Writing Daily Routines

Once your rooms are selected, you will move on to the second part, which is the creation of daily routines. This involves detailing the activities within each chosen room, segmented by time slots. Here, you will input the location for each part of the routine, specifying the duration and the room in which each activity takes place. This granular approach allows for a comprehensive breakdown of the day's activities, providing clear insight into how spaces are utilized over time.

Daily Routines

You can press Enter to Add Activity

Here you have to put unique types of days that users do, from what time to what time the user is in one room or another.

A daily routine is completed when the last time slot (ended at 23:59) is written

Start Hour

00:00

End Hour

HH:MM

Room ▼

Reset

Add Activity

Complete Routine

Figure 6 Visualization of the Daily Routines definition section

Inputs for Activity Definition

In this section, you have three main inputs:

a) Start Hour: Automatically filled based on the previous activity's end time, this field represents the beginning of a new activity time slot. It ensures continuity as you build out the day's schedule.

b) End Hour: Here, you manually input the time when the current activity ends, using the HH:MM format. This defines the length of the activity within the time slot.

c) Room Selector: This dropdown list features the rooms you've selected in the first part of the Routine Definition. It allows you to assign each activity to a specific room, bringing structure and location into your daily routine.

Button Functions

Alongside the input fields, there are several buttons designed to streamline the process:

a) Reset: By pressing this, you can clear all inputs and start afresh if you need to redefine your daily routine from the beginning.

b) Add Activity: Once you've filled out the inputs for a time slot, hitting 'Add Activity' will:

➤ **Update the Start Hour to the last End Hour entered,** setting up the beginning of the next activity.

➤ **Clear the End Hour field,** ready for you to input the next activity's ending time.

- **Generate a table that populates with each completed activity**, showing the time interval and the associated room. This gives you a clear overview of how the routine is shaping up throughout the day.

Routines Day 1

Day	Start-Time	End-Time	Room
1	00:00	09:30	room
1	09:30	10:20	dining-room
1	10:20	12:45	gym
1	12:45	13:30	dining-room
1	13:30	17:52	terrace
1	17:52	19:45	room
1	19:45	20:30	dining-room

Figure 7 Example of table autofilled as the the activities are introduced

c) Complete Routine: When all daily activities are entered, and you've input the final End Hour as 23:59, you can press this button. It signifies the completion of a full day's routine. The system will then offer to download the data as a CSV file and prompt you to move on to the next step in the Routine Definition section

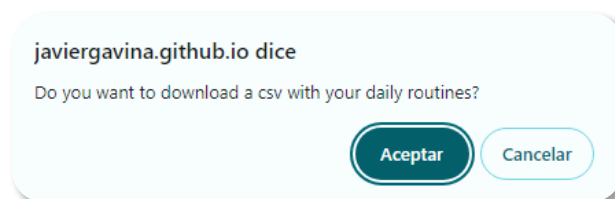


Figure 8 Confirmation message to download the daily routines csv

	A	B	C
1	Day,Start-Time,End-Time,Room		
2	1,00:00,09:30,room		
3	1,09:30,10:20,dining-room		
4	1,10:20,12:45,room		
5	1,12:45,13:30,dining-room		
6	1,13:30,16:20,room		
7	1,16:20,17:30,therapy		
8	1,17:30,19:00,tv-room		

Figure 9 Example of daily_routines.csv

Completing a Daily Routine

It's important to note that a daily routine is only considered complete once you have filled the End Hour as 23:59. This action resets the table for a new day, allowing you to start defining activities for the next day. Once you've finished inputting activities for one day, and only then, should you press **Complete Routine** to finalize the daily schedule. If you add another activity, you must complete the day's routine to proceed to the routine description's completion.

Part Three: Calendar Scheduling for Simulation

The final part of the Routine Definition is where your daily routines come to life in a schedule format. You will take the unique daily routines you've described and drag them onto a calendar interface. This acts as a scheduler, allowing you to assign different routines to different days as you see fit. The visual nature of this calendar helps you to see at a glance how routines are distributed throughout the week, providing a clear picture of the simulation model you are building. Once you have completed your schedule, you will have a structured routine ready for the next step: the Routine Simulation.

Schedule Routines

In this section you can create routines by **dragging the routines defined on the left** to the corresponding day in the calendar. You can **undo a routine selection by double-clicking** on the day in the calendar. You also have the option to clear all selections with the **Reset** button. At the end, you can export the routines to a JSON with the **Export to JSON** button.

Figure 10 A visualization of the schedule routines section in routine definition

Calendar Customization

On the right side of the screen, you can customize the time frame of your Schedule.

Input fields are provided for **Year** and **Month** to allow you to navigate to the desired period for your simulation. Changing these values will update the central calendar to display the corresponding dates.

Defined Daily Routines

On the left side, you'll find the list of daily routines you defined earlier:

If you need to review the specific activities of any routine, **simply click on one of the 'routine day' tabs**. This action will redirect you to a table representing the selected routine, allowing you to recall the sequence of activities and rooms involved.

Drag-and-Drop Scheduling

The central feature of this section is the interactive calendar:

- **Assigning Routines to Dates:** Assigning a routine to a date is as straightforward as **dragging a defined routine from the left side and dropping it onto the corresponding day in the calendar**.
- **Correcting Mistakes:** Should you misplace a routine or change your mind about the schedule, you can undo the action by **double-clicking on the specific day in the calendar**. This feature ensures that adjustments can be made easily without having to start from scratch.
- **Global Reset:** If you wish to clear all selections and start the scheduling process again, the **Reset button** on the right side will remove all assigned routines from the calendar.

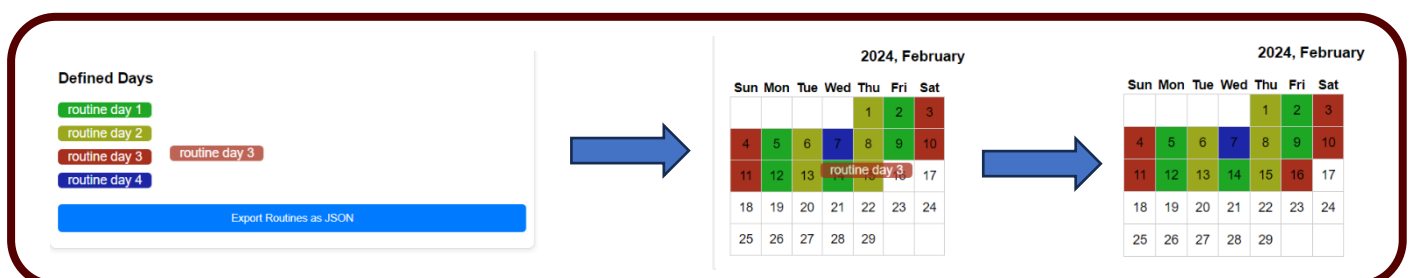


Figure 11 Process of dragging-and-dropping routines to calendar

Completing the Scheduling

Once all routines are assigned to the appropriate dates you will have to export the schedule as JSON

For that, you have to click the **Export Routines as JSON** button to finalize your schedule. This will generate and download a file named **assigned_routines.json**, which contains a structured representation of your schedule. The JSON file will map each date to a routine with corresponding time intervals and rooms, as illustrated as follows:

```
{
  "2024-2-1": {
    "typeDate": "2",
    "intervals": [
      ["00:00", "09:30"], ["09:30", "10:20"],
      ["10:20", "12:45"], ["12:45", "13:30"],
      ["13:30", "16:20"], ["16:20", "17:30"],
      ["17:30", "19:00"], ["19:00", "19:45"],
      ["19:45", "20:30"], ["20:30", "23:59"]
    ],
    "rooms": [
      "room", "dining-room", "terrace", "dining-room",
      "room", "garden", "gym", "room", "dining-room",
      "room"
    ]
  },
  "2024-2-2": {
    "typeDate": "1",
    "intervals": [
      ["00:00", "09:30"], ["09:30", "10:20"],
      ["10:20", "12:45"], ["12:45", "13:30"],
      ["13:30", "16:20"], ["16:20", "17:30"],
      ["17:30", "19:00"], ["19:00", "19:45"],
      ["19:45", "20:30"], ["20:30", "23:59"]
    ],
    "rooms": [
      "room", "dining-room", "room", "dining-room", "room",
      "therapy", "tv-room", "room", "dining-room", "room"
    ]
  }
}
```

This structured approach ensures that the simulation schedule is clear, precise, and ready for the Routine Simulation phase. By exporting the JSON file, you retain a detailed, editable record of the planned activities, providing a foundation for accurate simulation and analysis.

Routine Simulation

Welcome to the Routine Simulation section, where your carefully crafted daily schedules transform into dynamic visual data. This section is all about bringing your routine definitions to life, allowing you to witness the potential real-world application of your routines. It is divided into two interactive parts:

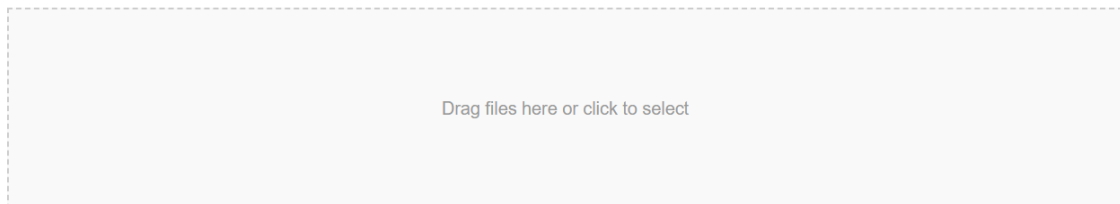
Part One: Uploading your routine

Routine Simulation

In this section, you have to drag a descriptive file of routines of a user, and by modifying the threshold parameter (which determines the variability of the time slots of the routines), you can obtain a file in which for each minute of the day you have noted in which room a user is in.

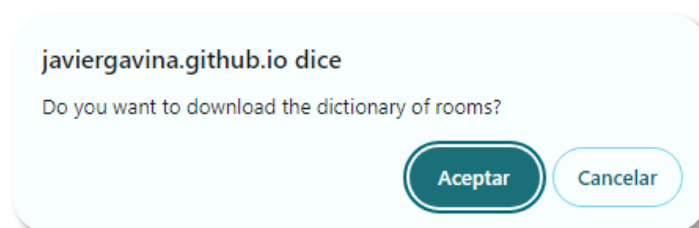
This file can be obtained in the [Routines Definition section](#).

Select or drag a file to process it and continue working with the web page.



The section begins with uploading the ***assigned_routines.json*** file, which you generated in the ***Routine Definition*** section. Here, you have the flexibility of either dragging the file to a designated drop area or selecting the file through a standard file picker interface. This process is intuitive and straightforward, ensuring that you can move forward with ease.

Once we upload the file, the website asks us the following:



The **dictionary of rooms file** is a **JSON** that has the **correspondences between rooms and an ID**. This is useful, since the file that is downloaded with the simulation of the routines, indicates the room with an id, so if we want to know the correspondence of the id with the rooms, we would have to download the file.

Anyway, the correspondence between the ID and the room is reflected in the following table:

Room	ID
<i>room</i>	1
<i>living-room</i>	2
<i>tv-room</i>	3
<i>dinning-room</i>	4
<i>garden</i>	5
<i>terrace</i>	6
<i>therapy</i>	7
<i>gym</i>	8
<i>corridors</i>	9
<i>bathroom</i>	10
<i>bedroom</i>	11
<i>garage</i>	12
<i>pool</i>	13
<i>kitchen</i>	14

Part Two: Visualizing and downloading the simulation

In the last part of the simulation of routines, you will be able to visualize in real time the labelmap, the result of the simulation of the routine, add randomness to the time intervals and finally, download the file with the simulation.

What is a labelmap?

A labelmap, within the context of routine simulation on our platform, is a data visualization tool that serves as a graphical representation of a user's daily activities. It provides an intuitive and immediate visual method to analyze and interpret the day-to-day life and movements of an individual through different spaces, specifically rooms in this case.

Here is how the labelmap works and what it represents:

- **Temporal Granularity:** The labelmap is structured to display information at a minute-by-minute resolution. Each column in the labelmap corresponds to a minute of the day.
- **Spatial Visualization:** For each minute, the labelmap shows the location of the user, identified by room. The different rooms are typically color-coded or labeled in a way that makes it easy to distinguish one from another.
- **Daily Representation:** Each row on the labelmap represents a full day, encapsulating all the user's locations from midnight to midnight. This daily breakdown is repeated for every day that has been simulated or for which data has been collected.

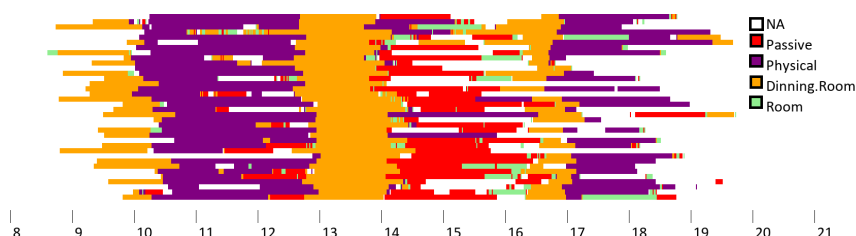


Figure 12 Example of a representation of a labelmap

Visualization and Interaction with the Labelmap

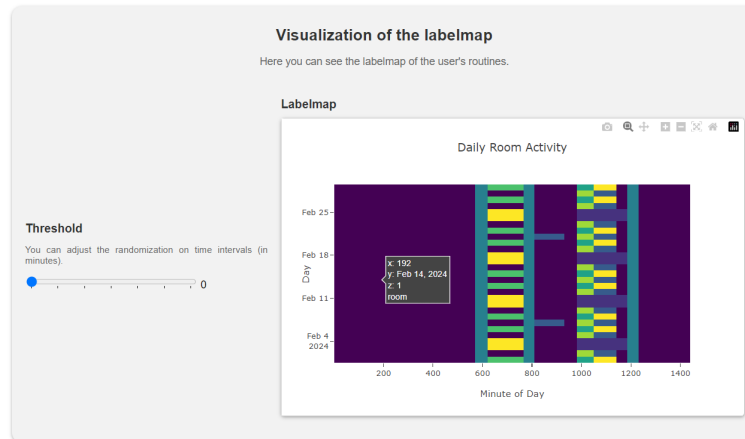


Figure 13 Representation of the labelmap visualization in the routine simulation section

In the Routine Simulation section of our platform, the labelmap serves as a key visual tool to understand and analyze the simulated daily routines of users. This interactive labelmap is not just a static display but an immersive experience that allows you to explore and modify the simulation data in real-time.

Threshold Slider

The threshold slider is a control element that lets you introduce randomness into the simulation. This feature is designed to add variability to the time intervals of each activity, mimicking the natural fluctuations in a person's daily schedule.

As you adjust the slider, the degree of randomness, measured in minutes, changes. Moving the slider alters the start and end times of the activities within the defined threshold range.

Changes made using the threshold slider are reflected instantly in the labelmap visualization, providing immediate feedback on how the randomness affects the simulated routines.

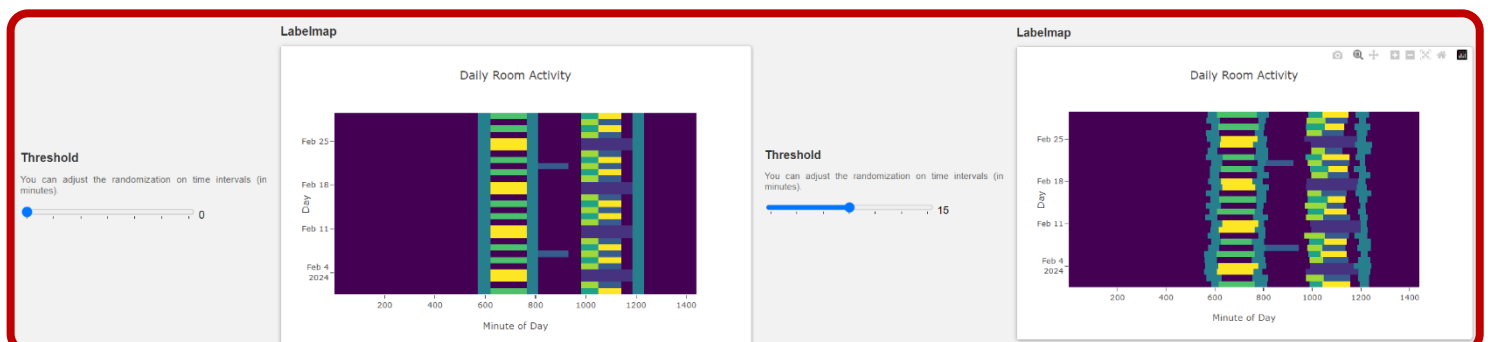


Figure 14 Visualization of how threshold affects the labelmap

Labelmap Visualization

The labelmap is equipped with interactive capabilities. When you hover your mouse over any part of the graph, it will display detailed information for that specific point in time, and also you can zoom in a specific region by selecting with the mouse the area of interest.

Data Display on Mouseover:

- **X-Axis (Minute of Day):** Indicates the exact minute of the day you are examining.
- **Y-Axis (Date):** Shows the date, allowing you to see how the user's routine varies from day to day.
- **Z-Axis (Room ID):** Provides an identifier for the room corresponding to that time slot.
- **Room Name:** Directly below the Z-axis value, you will see the name of the room, offering a straightforward reference to the location.



Figure 15 Interactive text displayed on mouseover

Finalizing the simulation

Labelmap

Here you can download the labelmap of the user's routines.

Download labelmap

Figure 16 Part of downloading the routine simulation

Once you have explored the labelmap and adjusted the threshold to represent a realistic variability of the user's routine, you can finalize the simulation.

Below the part of visualization, we have a **Download labelmap** button. If you press it, you'll download the results of your simulation with the applied randomness. This downloaded file encapsulates the routine simulation, including the noise introduced by the threshold slider, giving you a comprehensive and realistic dataset for further analysis or record-keeping.

The routine simulation file, **labelmap.csv**, has the following format:

Year	Month	Day	Sequence
2024	2	1	1,1,1,1,1...,2,2,2,2,2,...,6,6,6,6,6,6,...,1,1,1,1
2024	2	2	1,1,1,1,1...,4,4,4,4,4,...,1,1,1,1,1,1...,3,3,3,3
2024	2	3	1,1,1,1,1,...,3,3,3,3,3,...,6,6,6,6,6,6,...,1,1,1,1
...