

1. Logic Building Task

Stairs Construction Algorithm

You are working as an automation engineer at construction site. You've been tasked with figuring out how to build the best staircase EVER. Your client has given you an overview of the types of bricks available, plus a budget. You can buy different amounts of the different types of bricks (for example, 3 little pink bricks, or 5 blue lace bricks). Your client wants to know how many different types of staircases can be built with each amount of bricks, so he can pick the one with the most options.

Each type of staircase should consist of 2 or more steps. No two steps are allowed to be at the same height - each step must be lower than the previous one. All steps must contain at least one brick. A step's height is classified as the total amount of bricks that make up that step.

For example, when $N = 3$, you have only 1 choice of how to build the staircase, with the first step having a height of 2 and the second step having a height of 1: (# indicates a brick)

```
#
# #
2 1
```

When $N = 4$, you still only have 1 staircase choice:

```
#
#
# #
3 1
```

But when $N = 5$, there are two ways you can build a staircase from the given bricks. The two staircases can have heights (4, 1) or (3, 2), as shown below:

Choice-1

```
#
#
#
# #
4 1
```

Choice-2

```
#
# #
# #
3 2
```

Write a function called `solution(n)` that takes a positive integer `n` and returns the number of different staircases that can be built from exactly `n` bricks. `n` will always be at least 3 (so you can have a staircase at all), but no more than 200.

Example 1

Input: `solution(3)`

Output: 1

Example 2

Input: `solution(200)`

Output: 487067745

2. Data Science Task

Car Number Plate Detection and Recognition

You are given a dataset of car images with their number plates visible in the images. Your task is to develop an algorithm that can detect the number plate in the given image and read the text on it accurately.

You are free to use any model or technique to detect the region of interest (ROI) in the image that corresponds to the number plate, and you can use any OCR (Optical Character Recognition) method to recognize the text on the number plate.

Your task is to train a model on this dataset and evaluate its performance on a separate set of test images. You should report the accuracy of your model in terms of the number of correctly identified number plates and the accuracy of the OCR in terms of the percentage of correctly recognized characters. You can use any evaluation metric that you think is appropriate for this task.

Testing Dataset:

The dataset contains 500 car images and their corresponding ground truth labels. The images are provided in the JPEG format and the labels are in a CSV file. Each row in the CSV file corresponds to an image and contains the image filename and the ground truth label for the number plate in that image. The ground truth label is a string of characters that represent the text on the number plate.

You can download the dataset from this link: <https://www.kaggle.com/datasets/dataturks/vehicle-number-plate-detection>