



# Genetic, SA, and Hill Climbing for Cutting Stock Optimization

DeadLine: 4 Dec

Assignment 2

## Cutting Stock Problem

The cutting stock problem involves cutting parts with standard sizes from stock materials, such as roll paper or sheet metal, into pieces of specific sizes (requests) while minimizing material wastage. In terms of computational complexity, the problem is NP-hard.

Suppose a paper machine can produce an unlimited number of original rolls, and we have several requests. The objective is to cut these rolls in a way that fulfills all requests using the minimum number of rolls simultaneously. For instance, consider having ten-meter paper rolls and receiving requests for 3, 5, and 7-meter rolls. The following are the optimal solutions for this example using two rolls.

Waste	3	5
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Waste	7
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## Instructions

To maximize your score, your code should:

1. input1: Find a way to cut that uses less than 56 rolls.
2. input2: Find a way to cut that uses less than 80 rolls.
3. input3: Find a way to cut that uses less than 115 rolls.
4. input4: Find a way to cut that uses less than 235 rolls.

Solve the above problem using genetic, simulated annealing, and hill climbing algorithms. Provide a summary clarifying the functionality of your code and detailing the enhancements made to its performance.

## Additional Guidance

- Make sure your code is in .ipynb format.
- Along with your code, please include a report file that thoroughly analyzes your results.