**Metaheuristics, 2025/2026: MAXSAT**

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**Question 1:** After implementing Next Ascent Hillclimbing using a 1-bit Hamming Distance neighbourhood we ran them on the *uf20-01.cnf* for 30 runs and got the following results:

Uma imagem com vestuário, tecido, padrão

Os conteúdos gerados por IA podem estar incorretos.

**Run 24 found the best solution, with the highest fitness of 91 and the lowest amount of evaluations: 22.**

When attempting to run the Next Ascent Hillclimbing algorithm on the uf100 and uf250 instance, the algorithm fails to produce results. This is because the neighbourhood size grows linearly with the number of variables: for 100 variables, generating the full 1-bit Hamming distance neighbourhood produces 100 neighbours per solution. While this is manageable for smaller instances (e.g., uf20), the evaluation of each neighbour becomes computationally intensive due to the number of clauses (430) to check per neighbour. As a result, the algorithm effectively ‘explodes’ in the first iteration, making the evaluation impractical without optimisation or limiting the number of neighbours evaluated.

**Question 2:** I

**Question 3:** After

**Question 4:** After

**Question 5:** After