Hand-in Exercise: Superheroes

Philip Bille Inge Li Gørtz

1 Superhero Team

Consider building a team T of superheroes from a set S of available superheroes. Each superhero has a *cost*. A *superhero team* T is a subset of S and the *cost* of T is the sum of cost of all superheroes in T. Throughout the exercise, we let m denote the size of S and assume that S is given as an array A where each entry contains the cost of a superhero.

1.1 Give an algorithm that computes the cost of a cheapest team of 7 superheroes. Analyze the running time of your algorithm in terms of parameter m.

1.2 As exercise 1.1 but now we want an algorithm that computes the cost of a cheapest team of $\lfloor \sqrt{m} \rfloor$ superheroes. Analyze the running time of your algorithm in terms of parameter m.

1.3 Give an algorithm that computes the number of *distinct* costs of superheroes, i.e., the number of different costs of the superheroes in S. Analyze the running time of your algorithm in terms of parameter m.