Exercise 6: Arrays and 2D Arrays

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1 Exercises

1. Define Boolean functions
   - `is_prime(n)` that tests whether a non-negative integer `n` is prime or not.
   - `is_cube(n)` that tests whether number `n` is a perfect cube.
   - `is_divisible_by (n, d)` that tests whether an integer `n` is divisible by integer `d`.
2. Sort the list of numbers based on their weights, where the weight of a number is defined as

$$\text{weight}(n) = \begin{cases} 3 & n \text{ is prime.} \\ 4 & n \text{ is a multiple of 4 and divisible by 6.} \\ 5 & n \text{ is a pefect cube.} \end{cases}$$

3. Populate an array `heights[N]` with heights of persons and find how many persons are above the average height.
4. Populate a two dimensional array `a[N][N]` with heights and weights of persons and compute the Body Mass Index (BMI) of the individuals. `a[i][0]` and `a[i][1]` are the height and weight of `i` th person. BMI is defined as

$$\text{BMI} = \frac{\text{weight}}{\text{height}^2}$$

   where weight is in kg and height is in m.