

Determine the computational complexity of your implementation of 11.5, 11.6 and 11.7.

Computational complexity (11.5)

```
for (int i = 1; i < dim + 1; i++) ——— (n+1)
  for (int j = 1; j < dim + 1; j++) ——— n(n+1)
    if (i <= j) ——— n x n
      for (int k = 1; k < dim + 1; k++) ——— n x (n+1)
```

$O(n^2)$

Computational complexity (11.6)

```
for (int i = 0; i < dim; ++i) ——— n
  for (int j = 0; j < dim; j++) ——— n(n-1)
```

$O(n^2)$

Computational complexity (11.7)

```
for (int i = n-1; i >= 0; --i) ——— n
  for (int j = i+1; j < n; ++j) ——— n
```

$O(n^2)$

Runtime (11.5) / 11.6 and 11.7

$$n = 10^2 \quad \frac{1}{2} \quad 2 \text{ sec}$$

$$n = 5 \cdot 10^3 \quad = \quad ?$$

$$x = \left(\frac{5 \cdot 10^3}{10^2} \right)^2 \cdot 2 = 5000 \text{ sec.}$$