

Homework 2

Form of submission: hard copy

1. (25 points) Execute selection sort on an array containing the following elements: 8, 32, 4, 75, 23, 11, 54. Indicate which elements are swapped and show the contents of the array after each execution of the outer loop.
2. (25 points) Use the summation and product operators to express the following:
 - a. The sum of all integers from 2 to 42
 - b. The product of all integers from 6 to 45
 - c. The factorial of 29
 - d. The product of even integers from 2 to n (you can assume that n is even)
 - e. The sum of the powers of 5 from 25 to 5^k
3. (25 points) Prove the following statement by induction:

$$S(n) : \sum_{i=1}^n (3i - 2) = \frac{1}{2}n(3n - 1)$$

4. (25 points) Prove the following statement by induction:

$$T(n): n^3 + 2n \text{ is divisible by } 3.$$