SPEED UP ASSIGNMENT

1.

1.1

According to the Amdahl's law:

$S(o) = 1 / (1 - x) + (x / S(e))$

S(o): Speed up overall

S(e): Speed up enhanced

x: Fraction enhanced

In the exercise 1, it is stated that each of the improvement will improve its associated part of computation by a factor of 2, which means $S(e) = 2$. In addition, the fraction enhanced value will be:

Accessing memory: $x_1 = 0,3$

Multiplication: $x_2 = 0,2$

Executing other instruction: $x_3 = 0,5$

According to Amdahl's law with the formula $S(o) = 1 / (1 - x). (x / S(e))$, we can see that the larger x could be , the better S overall will become. Therefore, to improve the performance S overall to the largest, **improve x3 = 0,5 would be the best option**.

1.2

We have : $S(o) = 1 / (1 - x) + (x / 2)$

$X_1 = 0,3$ ➜ $S(o1) = 1,17$

$X_2 = 0,2$ ➜ $S(o2) = 1,11$

$X_3 = 0,5$ ➜ $S(o3) = 1,33$

2.

According to the Amdahl's law:

$S(o) = 1 / (1 - x) + (x / S(e))$

$S(o) = 1,2$

$X = 0,4$

⇨ $1,2 = 1 / (1 - 0,4) + (0,4 / S(e))$ ➜ $0,72 + (0,48/S(e)) = 1$
⇨ **Speed enhanced S(e) = 0,48 / 0,28 = 1,71**