Exercise 1

1.1 Reading

1.2 Moore's Law

1.2.1

1.3 Amdahl's Law

1.3.1

- new CPU 10 times faster
- old CPU spent 40% of execution time on calculations
- remaining time was for IO

$$S := 60\% \tag{1}$$
$$P := 40\% \tag{2}$$
$$N := 10 \tag{3}$$

$$Speedup = \frac{1}{.6 + \frac{.4}{10}} = 1.563 \tag{4}$$

$\Rightarrow$ We would expect a 56% performance improvement from the new CPU.

1.3.2

1.3.3

$$100 = \frac{1}{(1-P) + \frac{P}{128}} \tag{5}$$
$$\Leftrightarrow P = 0.9978 \tag{6}$$
$$\Rightarrow S \leq 0.22\% \tag{7}$$