FATMA NUR SEFER - 1901042679 - CSE 331 - HW1

1) A compiler designer wants to improve the performance of a machine for one specific program. The program has the following properties.

	R-type ($\times 10^4$)	I-type ($\times 10^6$)	J-Type
Program Instruction	50	30	20
Required Cycles	2	4	3

Assume you can improve only one type with 50%. Which type do you prefer for improvement and how many times can you improve the whole program in the end?

⇒ R-Type ⇒ $50 \times 2 = 100n$
I-Type ⇒ $30 \times 4 = 120n$
J-Type ⇒ $20 \times 3 = 60n$
} Improve I-type because I-type has most total cycle

After 50% improve of the I-type, its total cycle becomes 60n cycle

Before Improvement ⇒ $100n + 120n + 60n = 280n$
After Improvement ⇒ $100n + 60n + 60n = 220n$

$\frac{280n}{220n} = 1.27$ times improve in the end