

1 Homework 1

1.1 Textbook Problem 4.15.5

Consider three different processors P1, P2, and P3 executing the same instruction set. P1 has a 3 GHz clock rate and a CPI of 1.5. P2 has a 2.5 GHz clock rate and a CPI of 1.0. P3 has a 4.0 GHz clock rate and has a CPI of 2.2.

Processor	Clock Rate	CPI	Performance
P1	3 GHz	1.5	2 GHz
P2	2.5 GHz	1.0	2.5 GHz
P3	4.0 GHz	2.2	1.8 GHz

- (a) Which processor has the highest performance expressed in instructions per second?
Answer:

- (b) If the processors each execute a program in 10 seconds, find the number of cycles and the number of instructions.
- (c) We are trying to reduce the execution time by 30% but this leads to an increase of 20% in the CPI. What clock rate should we have to get this time reduction?