**Course Code: EE488**

**Assignment -01**

**PREPARED BY**

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**1 No Question Answer:**

**1.**

**(a)**

**Option -1**

**Given in Statement,**

20% on processing, 30% on Disk access, 50% on network transfer, base system consisting of a 500MHz processor. It support 10,000 average web page accesses/sec.

**Given in Condition,**

Here, f= 0.3 and k = 2 because initially k = 1 as data transfer rate double up in the question from 20Mbytes/sec to 40 Mbytes/sec.

We know that,

Speed = 1/ (1-f) + (f / k) = 1/ (1-0.3) (0.3/2) = 1.1765

Average web page access = 1.176\*10000 = 11760 web page/sec

**Option -2**

Here, f= 0.2 and k = 1.6, because it changes 500MHz processor to 800MHz processor. So 800/500 = 1.6

We know that,

Speed = 1/ (1-f) + (f / k) = 1/ (1-0.2) (0.2/1.6) = 1.081

Average web page access = 1.081\*10000 = 10810 web page/sec

**Option -3**

We know that,

S = 1 / (1 – Σ (fraction en) + (fraction en / Speedup factor) + (fraction en / Speedup factor) )

Speed = 1/ (1-0.5) + (0.2/ (800/500)) + (0.3/2)) = 1.290

Average web page access = 1.290\*10000 = 12900 web page/sec

**2.**

**Cost performance Analysis for a. Option 1:**

From statement we can observe that it costs 1000$ to improve by (11760-10000) = 1760 webpage/s Therefore, it takes 1$ to increase this amount 1760/1000 = 1.76.

**Cost performance Analysis for b. Option 2:**

From statement we can observe that it costs 800$ to improve by (10810-10000) = 810 webpage/s Therefore, it takes 1$ to increase this amount 810/800 = 1.013

**Cost performance Analysis for c. Option 3:**

From statement we can observe that it costs 1500$ to improve by (12900-10000) = 2900 webpage/s Therefore, it takes 1 $ to increase this amount 2900/1500 = 1.933.

From that analysis I can say that performance for c. option 3 is better in terms of cost as it improves 1.933 to cost at each dollar which is greater than option 1 and option 2.

**2 No Question Answer:**

(a)

Given,

A speed up by 10 times, So A = f\_A \* 10

2f\_A will be get slowed down by 5 times, so it will be 2f\_A \* 1/5

So, parameterized speed-up equations

Speed-up = f\_A \* 10 + (1 - f\_A - f\_B) \* 1 – 2f\_A \* (1/5)

**(b)**

Given,

B speed up by 20 times, So B = f\_B \* 20

2f\_B will be get slowed down by 2 times, so it will be 0.5f\_B \* 1/2

So, parameterized speed-up equations

Speed-up = f\_B \* 20 + (1 - f\_A - f\_B) \* 1 - 0.5 f\_B \* (1/2)

**(c)**

Given,

A speed up by 4 times, So A = f\_A \* 4

f\_A will be get slowed down by 5 times, so it will be f\_A \* 1/1.8

So, parameterized speed-up equations

Speed-up = f\_A \* 4 + (1 - f\_A - f\_B) \* 1 – f\_A \* (1/1.8)

**(2)**

As a beginner architect, option **(b),** I will preferred because one of the fraction component sped up by 20 times the most whereas another fraction get slow down by 2 times which is close to option **(c)’s** one fractionbut their one fraction speed up by just 4 times so I won’t choose option c. on the other hand for option **(a)** one of its fraction increased by 10 times but other one slowed by 5 times. Therefore, I would finally choose option **(b)**

**3 No Question Answer:**

**(a)**

For System 1,

Given,

Execution time = 0.45\*1+0.35\*10+0.2\*5= 4.95 s

We know,

Performance = 1/ execution time = 1/4.95 = 0.202

For System 2,

Given,

Execution time = 0.45\*2+0.35\*7+0.2\*3= 3.95 s

We know,

Performance = 1/ execution time = 1/3.95 = 0.253

For System 3,

Given,

Execution time = 0.45\*1.5+0.35\*5+0.2\*4= 3.23 s

We know,

Performance = 1/ execution time = 1/3.23 = 0.31

Therefore, with the performance analysis we can say that System 3 has given the better output performance among all the system.

**(b)**

Here we got the information from (a) that system 1 execution time 4.95s, performance is 0.202 and it costs 8000$ the most and it is not the up to mark among all the systems. As it burn more dollar and performance is low to other two system. We got the information from (a) that system 2 execution time 3.95s, performance is 0.253 and it costs 5000$ the least and it provides decent result in terms of money spending. We got the information from (a) that system 3 execution time 3.23s, performance is 0.31 and it costs 6500$ the second most although it has least execution time.

For me I would choose system 2 as it cost much less and it gives better result than system 1 and it also deliver the result close to system 3 in terms of performance.

Github link : <https://github.com/KhandokerSamiulHoque/KHANDOKER_ASSIGNMENT-01_19837_EE481.git>