

Bilgisayar Donanımı

2. ÖDEV

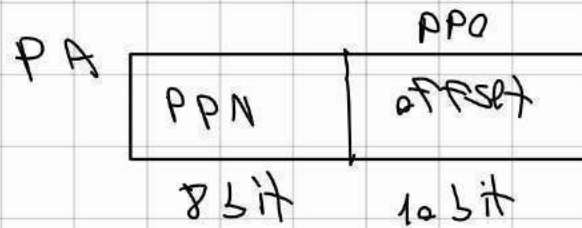
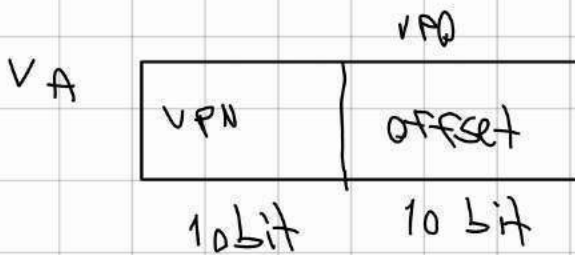
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20011019

Soru 1

Page \rightarrow 1kB offset genişliği $= \log_2 2^{10} = 10 \text{ bit}$

1kB $= 2^{10}$ Byte



$$\text{sıra sayısı} = 512 \text{ word} / 8 \text{ set} \times 8 \text{ word/set} = 8$$

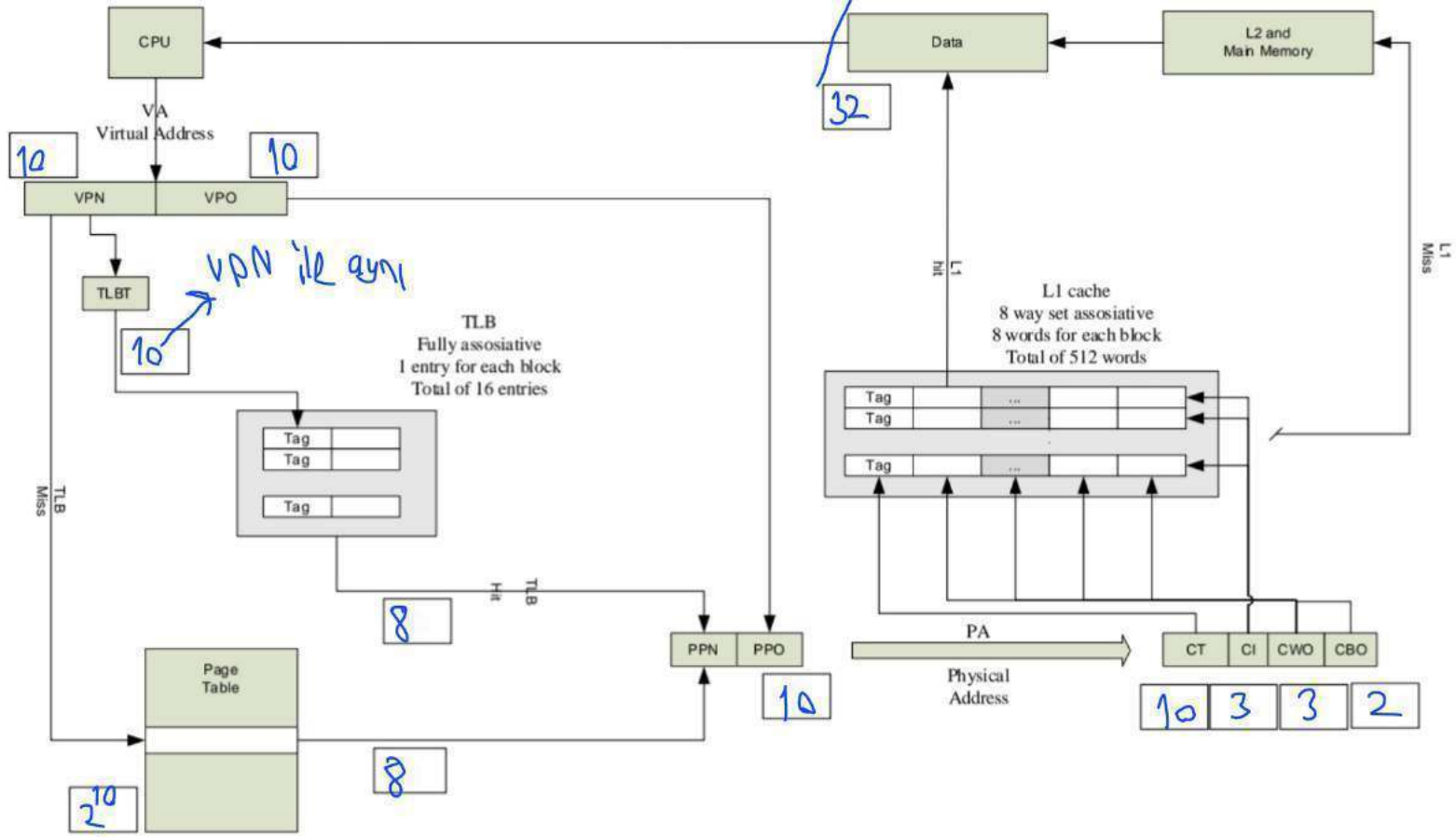
$$\text{cache index} = \log_2 8 = 3 \text{ bit}$$

$$\text{cache byte offset} = 32 / 8 = 4 \Rightarrow \log_2 4 = 2 \text{ bit}$$

$$\text{cache word offset} = \text{her blokta 8 word} \Rightarrow \log_2 8 = 3 \text{ bit}$$

$$\text{cache tag} = 18 - 2 - 3 - 3 = 10 \text{ bit}$$

veri yolu genişliği
32 bit olukları için



VPN 10 bit olduğu için

Soru 2

İşlemleri Tipi:

Ayarlar

Ana Sayfa

Bir ayar bulun

Sistem

- Ekran
- Ses
- Bildirimler ve eylemler
- Odaklanma yardımı
- Güç ve uyku
- Pil
- Depolama
- Tablet
- Çok görevli
- Bu bilgisayarda göster
- Paylaşılan deneyimler

Hakkında

Kişisel bilgisayarınız izlenmekte ve korunmakta.

[Windows Güvenliği ayrıntılarını görün](#)

Cihaz özellikleri

Cihaz adı: DESKTOP-RQ5FJD1

İşlemci: Intel(R) Core(TM) i5-3230M CPU @ 2.60GHz, 2.60 GHz

Takılı RAM: 8.00 GB (kullanılabilir: 7.90 GB)

Cihaz Kimliği: DEE1E1C2-A37C-4728-92B7-AE523BCD0026

Ürün Kimliği: 00328-00265-95594-AA924

Sistem türü: 64 bit işletim sistemi, x64 tabanlı işlemci

Kalem ve dokunma: Bu görüntü biriminde kalem girdisi veya dokunarak giriş yok

Kopyala

Bu bilgisayarın yeniden adlandır

Windows özellikleri

Edisyon: Windows 10 Education

Sürüm: 21H2

Yüklenme tarihi: 25.09.2021

İlgili ayarlar

- [BitLocker ayarları](#)
- [Aygıt Yöneticisi](#)
- [Uzak masaüstü](#)
- [Sistem koruması](#)
- [Gelişmiş sistem ayarları](#)
- [Bu bilgisayarın yeniden adlandır \(gelişmiş\)](#)
- [Yardım al](#)
- [Geri bildirimde bulunun](#)

Cache detayları:

Cache details				
Cache:	L1 data	L1 instruction	L2	L3
Size:	2 x 32 KB	2 x 32 KB	2 x 256 KB	3 MB
Associativity:	8-way set associative	8-way set associative	8-way set associative	12-way set associative
Line size:	64 bytes	64 bytes	64 bytes	64 bytes
Comments:	Direct-mapped	Direct-mapped	Non-inclusive Direct-mapped	Inclusive Shared between all cores

line size 64 B / 8 B (dovuz size) = her line'da 8 adet değer var.

$$\text{cache size: } \frac{64 \text{ KB}}{64 \text{ B}} = 2^{10} \text{ satır.}$$

Case 1:

dimension = 256

ijk formu

PC çıktısı:

```
secs:1.798717
==74==
==74== I refs:      783,287,031
==74== I1 misses:    1,444
==74== L1i misses:    1,414
==74== I1 miss rate:    0.00%
==74== L1i miss rate:    0.00%
==74==
==74== D refs:      306,628,504 (288,656,908 rd + 17,971,596 wr)
==74== D1 misses:    16,894,159 ( 16,868,936 rd +    25,223 wr)
==74== L1d misses:    26,480 (    1,311 rd +    25,169 wr)
==74== D1 miss rate:    5.5% (    5.8% +    0.1% )
==74== L1d miss rate:    0.0% (    0.0% +    0.1% )
==74==
==74== LL refs:      16,895,603 ( 16,870,380 rd +    25,223 wr)
==74== LL misses:     27,894 (    2,725 rd +    25,169 wr)
==74== LL miss rate:    0.0% (    0.0% +    0.1% )
```

Çözüm:

$$\frac{\text{dimension}}{\text{8 adet değer}} = \frac{2^8}{2^3} = 2^5 = \text{her 8 iteraasyonda bir miss yapması durumu}$$

$C \rightarrow$ her is loopda miss anen 0

$$\text{miss} = 2^8 \cdot 2^5 = 2^{13}$$

A → her is loopda miss om 12,5

$$m_{\text{is}} = 2^8 \cdot 2^5 \cdot 2^8 \cdot \frac{1}{8} = 2^{18}$$

B → her in leopda miss onen 100

$$\text{Miss} = 2^8 \cdot 2^5 \cdot 2^8 = 2^{21}$$

$$\text{total miss rate} = \frac{2^1 + 2^8 + 2^{13}}{3 \cdot (2^8 \cdot 2^8 \cdot 2^8)} = 0,047 \rightarrow 0\% 4,7 \quad //$$

Case 2:

dimension = 250

ikj farmer

PC GIKTISI:

```
secs:1.408654
==103==
==103== I   refs:      783,287,031
==103== I1  misses:    1,444
==103== LLi misses:    1,414
==103== I1  miss rate:  0.00%
==103== LLi miss rate:  0.00%
==103==
==103== D   refs:      306,628,504 (288,656,908 rd + 17,971,596 wr)
==103== D1  misses:    2,140,623 ( 2,115,400 rd +    25,223 wr)
==103== LLd misses:    26,480 (    1,311 rd +    25,169 wr)
==103== D1  miss rate:  0.7% (    0.7% +    0.1% )
==103== LLd miss rate:  0.0% (    0.0% +    0.1% )
==103==
==103== LL refs:      2,142,067 ( 2,116,844 rd +    25,223 wr)
==103== LL misses:    27,894 (    2,725 rd +    25,169 wr)
==103== LL miss rate:  0.0% (    0.0% +    0.1% )
```

Çözüm:

dimension 28 S

$\frac{8 \text{ adet deger}}{2} = \frac{2^3}{2} = 2 = \text{her } 8 \text{ noktasından bir miss girme oranı}$

C → her 16 loopda miss oranı 12,5

$$\text{miss} = \frac{2^8 \cdot 2^5 \cdot 2^8 \cdot 1}{8} = 2^{18}$$

A → her 16 loopda miss oranı 0

$$\text{miss} = 2^8 \cdot 2^5 = 2^{13}$$

B → her 16 loopda miss oranı 12,5

$$\text{miss} = \frac{2^8 \cdot 2^5 \cdot 2^8 \cdot 1}{8} = 2^{18}$$

$$\text{total miss rate} = \frac{2^{18} + 2^{18} + 2^{13}}{3 \cdot (2^8 \cdot 2^8 \cdot 2^8)} = 0,0105 \rightarrow \% 1,05 //$$

case 3:

dimension = 256

jik formu

PC çıkışı:

```
secs:1.553624
==104==
==104== I refs:      783,287,013
==104== I1 misses:    1,441
==104== L1i misses:   1,411
==104== I1 miss rate:  0.00%
==104== L1i miss rate: 0.00%
==104==
==104== D refs:      306,628,498 (288,656,903 rd + 17,971,595 wr)
==104== D1 misses:   18,966,989 ( 18,941,766 rd +   25,223 wr)
==104== L1d misses:   26,480 (    1,311 rd +   25,169 wr)
==104== D1 miss rate:  6.2% (    6.6% +    0.1% )
==104== L1d miss rate:  0.0% (    0.0% +    0.1% )
==104==
==104== LL refs:      18,968,430 ( 18,943,207 rd +   25,223 wr)
==104== LL misses:    27,891 (    2,722 rd +   25,169 wr)
==104== LL miss rate:  0.0% (    0.0% +    0.1% )
```

Çözüm:

$$\frac{\text{dimension}}{\text{8 adet değer}} = \frac{2^8}{2^3} = 2^5 = \text{her 8 içerisinde bir miss yapması durumu}$$

C → her 16 loopda miss oranı 12,5

$$\text{miss} = 2^8 \cdot 2^5 \cdot \frac{2^8}{8} \cdot 1 = 2^{18}$$

A → her 16 loopda miss oranı 12,5

$$\text{miss} = 2^8 \cdot 2^5 \cdot 2^8 \cdot \frac{1}{8} = 2^{18}$$

B → her 16 loopda miss oranı 100

$$\text{miss} = 2^8 \cdot 2^5 \cdot 2^8 = 2^{21}$$

$$\text{Total miss rate} = \frac{2^{18} + 2^{18} + 2^{21}}{3 \cdot (2^8 \cdot 2^8 \cdot 2^8)} = 0,052 \rightarrow \%5,2 //$$

Case 4:

dimension = 64

ijk formu

Pc Çıktısı:

```
secs:0.060006
==91==
==91== I   refs:      12,914,365
==91== I1 misses:      1,459
==91== L1i misses:      1,427
==91== I1 miss rate:    0.01%
==91== L1i miss rate:   0.01%
==91==
==91== D   refs:      5,054,662 (4,704,477 rd + 350,185 wr)
==91== D1 misses:      52,698 ( 50,499 rd + 2,199 wr)
==91== L1d misses:      3,441 ( 1,311 rd + 2,130 wr)
==91== D1 miss rate:    1.0% ( 1.1% + 0.6% )
==91== L1d miss rate:   0.1% ( 0.0% + 0.6% )
==91==
==91== L   refs:      54,157 ( 51,958 rd + 2,199 wr)
```

```

==91== LL misses:      4,868 ( 2,738 rd + 2,130 wr)
==91== LL miss rate:    0.0% ( 0.0% + 0.6% )

```

Çözüm:

$$\frac{\text{dimension}}{\text{8 adet değer}} = \frac{2^6}{2^3} = 2^3 = \text{her 8 iterasyonda bir miss yapması durumu}$$

C → her 14 loopda miss oranı 0

$$\text{miss} = 2^6 \cdot 2^3 = 2^9$$

A → her 14 loopda miss oranı 0

$$\text{miss} = 2^8 \cdot 2^3 = 2^9$$

B → her 14 loopda miss oranı 12,5

$$\text{miss} = \frac{2^6 \cdot 2^3 \cdot 2^0}{8} = 2^{12}$$

$$\text{Total miss rate} = \frac{2^9 + 2^9 + 2^{12}}{3 \cdot (2^6 \cdot 2^8 \cdot 2^0)} = 0,0005 \rightarrow \%0,05 //$$

Case 5:

dimension = 64

ikij formu

PC faktörü:

```

secs:0.070269
==92==
==92== I   refs:      12,914,365
==92== I1  misses:    1,459
==92== LLi misses:    1,427
==92== I1  miss rate:  0.01%
==92== LLi miss rate:  0.01%
--92--

```

```

==92== D refs:      5,054,662 ( 4,704,477 rd + 350,185 wr)
==92== D1 misses:   14,259 ( 12,060 rd + 2,199 wr)
==92== Lld misses:   3,441 ( 1,311 rd + 2,130 wr)
==92== D1 miss rate: 0.3% ( 0.3% + 0.6% )
==92== Lld miss rate: 0.1% ( 0.0% + 0.6% )
==92==
==92== LL refs:      15,718 ( 13,519 rd + 2,199 wr)
==92== LL misses:    4,868 ( 2,738 rd + 2,130 wr)
==92== LL miss rate: 0.0% ( 0.0% + 0.6% )

```

Çözüm:

$$\frac{\text{dimension}}{\text{8 adet deger}} = \frac{2^6}{2^3} = 2^3 = \text{her 8 iterasyonda bir miss yapması durumu}$$

\hookrightarrow her 14 loopda miss oranı 0

$$\text{miss} = 2^6 \cdot 2^3 = 2^9$$

\hookrightarrow her 14 loopda miss oranı 0

$$\text{miss} = 2^8 \cdot 2^3 = 2^9$$

\hookrightarrow her 14 loopda miss oranı 0

$$\text{miss} = 2^6 \cdot 2^3 = 2^9$$

$$\text{Total miss rate} = \frac{2^9 + 2^9 + 2^9}{3 \cdot (2^6 \cdot 2^8 \cdot 2^6)} = 0,009 \rightarrow \%0,19 //$$

Case 6:

dimension = 64

jik formu

PC Çıktısı:


```

==93== I   refs:      12,914,358
==93== I1  misses:    1,457
==93== L1i misses:    1,425
==93== I1  miss rate:  0.01%
==93== L1i miss rate:  0.01%
==93==
==93== D   refs:      5,054,660 (4,704,476 rd + 350,184 wr)
==93== D1  misses:    76,868 ( 74,669 rd + 2,199 wr)
==93== L1d misses:    3,441 ( 1,311 rd + 2,130 wr)
==93== D1  miss rate:  1.5% ( 1.6% + 0.6% )
==93== L1d miss rate:  0.1% ( 0.0% + 0.6% )
==93==
==93== LL  refs:      78,325 ( 76,126 rd + 2,199 wr)
==93== LL  misses:    4,866 ( 2,736 rd + 2,130 wr)
==93== LL  miss rate:  0.0% ( 0.0% + 0.6% )

```

Çözüm:

$$\frac{\text{dimension}}{\text{8 adet deger}} = \frac{2^6}{2^3} = 2^3 = \text{her 8 iterasyonda bir miss yapması durumu}$$

C → her 16 loopda miss oranı 12,5

$$\text{miss} = 2^6 \cdot 2^3 \cdot 2^6 \cdot \frac{1}{8} = 2^{12}$$

A → her 16 loopda miss oranı 0

$$\text{miss} = 2^8 \cdot 2^3 = 2^9$$

B → her 16 loopda miss oranı 12,5

$$\text{miss} = 2^6 \cdot 2^3 \cdot 2^6 \cdot \frac{1}{8} = 2^{12}$$

$$\text{Total miss rate} = \frac{2^{12} + 2^9 + 2^{12}}{3 \cdot (2^6 \cdot 2^8 \cdot 2^6)} = 0,011 \rightarrow 0/01,1 //$$

