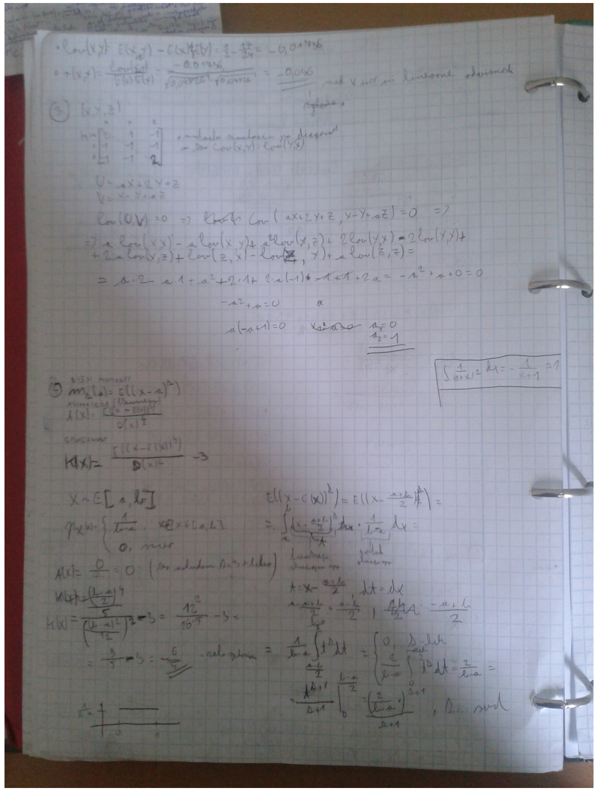
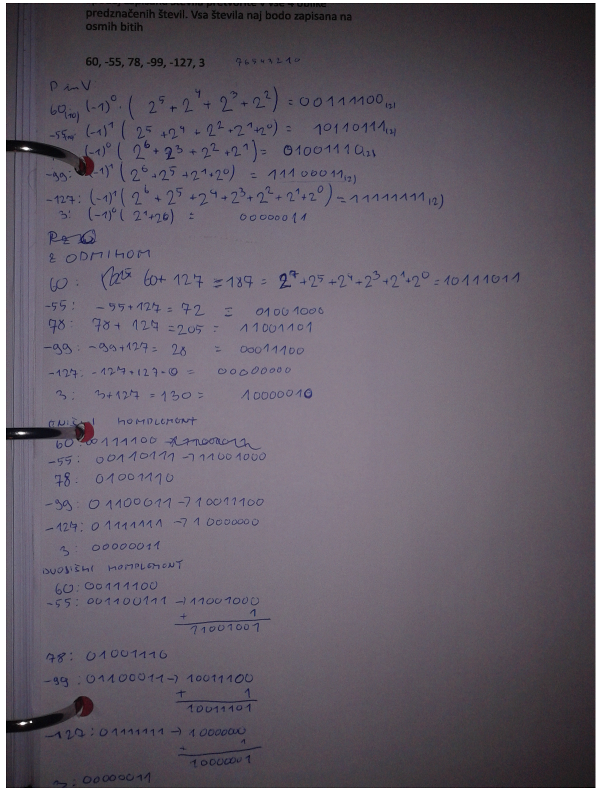
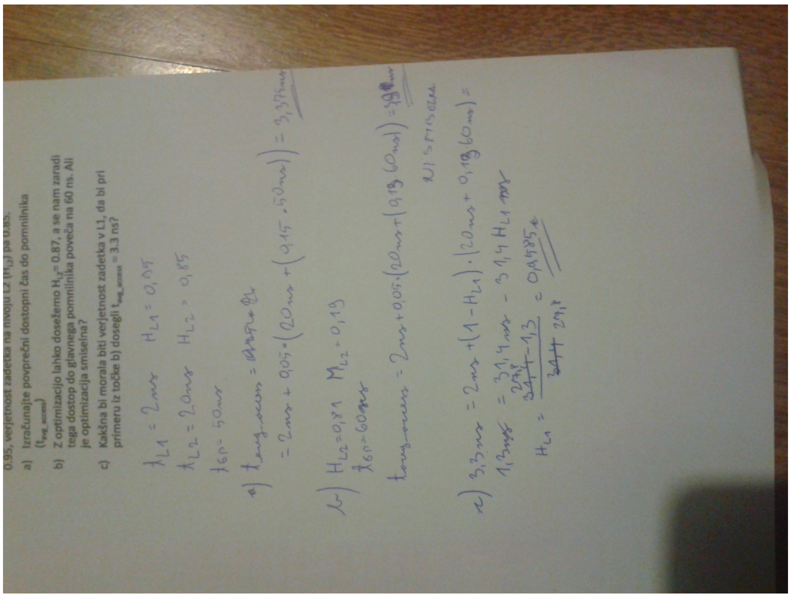

SAMSUNG
Please refer to manual before using battery.
Veuillez consulter le guide d'utilisation
avant d'utiliser la pile.
Referez-vous au mode d'emploi
avant d'utiliser la batterie.
Consulte o manual antes de usar a bateria.
Por favor lea el manual antes de utilizar la batería.
请按照说明书指示使用电池.
EB-L1H2LLU 2100 mAh
S/N: AA1DC20RS/5-B
生产日期: 2013.12.20




predznačenih števil. Vsa števila naj bodo zapisana na
osmih bitih
60, -55, 78, -99, -127, 3


0.95, verjetnost zadetka na nivoju L2 (H_{L2}) pa 0.85.

a) Izračunajte povprečni dostopni čas do pomnilnika (t_{avg_access})

b) Z optimizacijo lahko dosežemo H_{L2} = 0.87, a se nam zaradi tega dostop do glavnega pomnilnika poveča na 60 ns. Ali je optimizacija smiselna?

c) Kakšna bi morala biti verjetnost zadetka v L1, da bi pri primeru iz točke b) dosegli t_{avg_access} = 3.3 ns?

$t_{L1} = 2ns \quad H_{L1} = 0,95$

$t_{L2} = 20ns \quad H_{L2} = 0,85$

$t_{GP} = 50ns$

a) $t_{avg\_access} =$
$= 2ns + 0,05 \cdot (20ns + (0,15 \cdot 50ns)) = 3,375ns$

b) $H_{L2} = 0,81 \quad M_{L2} = 0,19$
$t_{GP} = 60ns$

$t_{avg\_access} = 2ns + 0,05 \cdot (20ns + (0,19 \cdot 60ns)) = 3,9ns$

NI SMISELNA

c) $3,3ns = 2ns + (1 - H_{L1}) \cdot (20ns + 0,19 \cdot 60ns) =$
$1,3ns = 31,4ns - 31,4 H_{L1}$
$H_{L1} = \frac{31,4 - 1,3}{31,4} = 0,9585$


SAMSUNG
Near Field Communication
MADE IN KOREA / FABRIQUE EN COREE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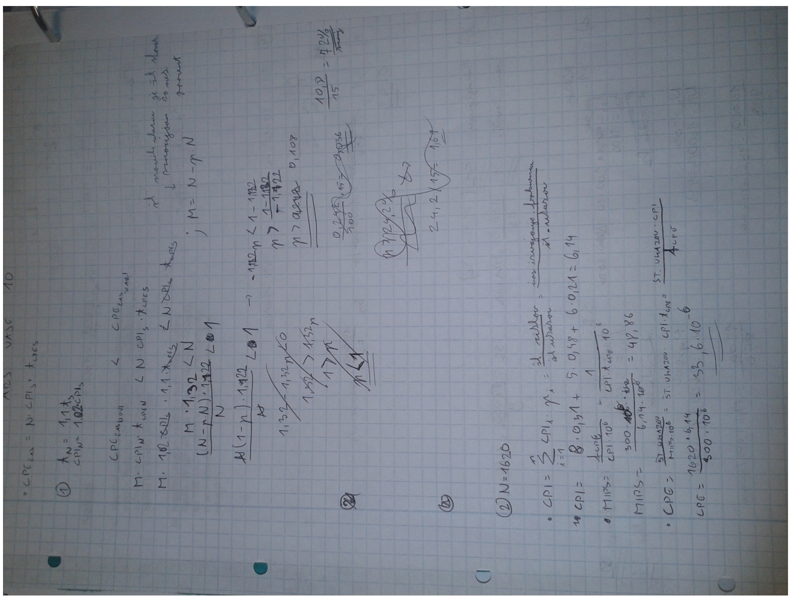
EB-L1G6LLU 2100 mAh
S/N: AA1F1217JS/2-B
2014.12.17
Total Value
USD10
Date and sender's signature



9.1

$X \sim \begin{pmatrix} -1 & 0 & 1 & 2 & 3 \\ 0{,}1 & 0{,}2 & 0{,}2 & 0{,}2 & 0{,}3 \end{pmatrix} \begin{matrix} \to x \\ \to P(X=x) \end{matrix}$

$E(X) = ? = \sum_x x \cdot P(X=x) = -1 \cdot 0{,}1 + 0 \cdot 0{,}2 + 1 \cdot 0{,}2 + 2 \cdot 0{,}2 + 3 \cdot 0{,}3 = \underline{\underline{1{,}4}}$

~~D(X)~~ =

1\. NAČIN

$E(X^2) = \sum_x x^2 \cdot P(X=x) = (-1)^2 \cdot 0{,}1 + 0^2 \cdot 0{,}2 + 1^2 \cdot 0{,}2 + 2^2 \cdot 0{,}2 + 3^2 \cdot 0{,}3 = 3{,}8$

2\. NAČIN:
napišemo shemo za X^2

$X^2 \sim \begin{pmatrix} 1 & 0 & 1 & 4 & 9 \\ 0{,}1 & 0{,}2 & 0{,}2 & 0{,}2 & 0{,}3 \end{pmatrix} \sim \begin{pmatrix} 0 & 1 & 4 & 9 \\ 0{,}2 & 0{,}3 & 0{,}2 & 0{,}3 \end{pmatrix}$

$D(X) = E((X - E(X))^2) = E(X^2) - E(X)^2$

$= 3{,}8 - 1{,}4^2 = 1{,}84$

[PONOVI INTEGRIRANJE]

$\sigma(X) = \sqrt{D(X)} = 1{,}36$

9.2 $E(X) = \int x \cdot p_X(x)\,dx = \dots = \frac{5}{27}$ $\qquad p_X(x) = \begin{cases} 6x+2 & , 0 \le x \le \frac{1}{3} \\ 0 & , \text{sicer} \end{cases}$

$E(X^2) = \int x^2 \cdot p_X(x)\,dx = \int_0^{1/3} x^2(6x+2)\,dx = \int_0^{1/3} 6x^3 + 2x^2\,dx = 6\int_0^{1/3} x^3\,dx + \int_0^{1/3} x^2\,dx =$

$= 6\left(\frac{x^4}{4}\right)\Big|_0^{1/3} + 2\left(\frac{x^3}{3}\right)\Big|_0^{1/3} = \dots = \frac{7}{162}$

$D(X) = E(X^2) - E(X)^2 = \frac{7}{162} - \left(\frac{5}{27}\right)^2 = \dots = \underline{\underline{\frac{13}{1458}}}$

$\sigma(X) = \sqrt{D(X)} = \dots$

9.3 $X \sim$ Enakomerna $[a, b]$ $\qquad p_X(x) = \frac{1}{b-a}$; $a \le x \le b$
0 , sicer

$E(X) = \int x\, p_X(x) = \int_a^b x \frac{1}{b-a} = \frac{1}{b-a} \cdot \frac{x^2}{2}\Big|_a^b =$

$= \dots = \frac{1}{2} \cdot \frac{1}{b-a}(b-a)(b+a) = \underline{\underline{\frac{b+a}{2}}}$

$E(X^2) = \int x^2 \frac{1}{b-a} = \frac{1}{b-a} \cdot \frac{x^3}{3}\Big|_a^b = \frac{1}{b-a}\left(\frac{b^3}{3} - \frac{a^3}{3}\right) = \frac{1}{3} \cdot \frac{1}{b-a}(b^3 - a^3)$

$= \dots \frac{b^2 + ab + a^2}{3}$

VIS VAJE 9

[8.]

$\bullet\ E(Y) = \int_{-\infty}^{\infty} y \cdot p_Y(y)\,dy = \int y e^{-y}\,dy = \Gamma(2) = 1$

8.6 a) lučaj 2x ...
X ... št. sodih (0, 1, 2)
Y ... št. 6 (0, 1, 2)

a)

X \ Y	0	1	2	
0	1/4	0	0	1/4
1	1/3	1/6	0	
2	1/9	1/9	1/36	9/36 = 3/12
	25/36	5/18		

1 K, 2 K

$P(X=1, Y=0) = \frac{1}{3}$

$P(X=1, X=2) = \frac{1}{3} \cdot \frac{1}{6} \cdot 2$

• b) • Sta neodvisni? NE $\left(\frac{25}{36} \cdot \frac{1}{4} \neq \frac{1}{4}\right)$

c) $P(X \mid Y=1) = \frac{P(X=x, Y=1)}{P(Y=1)}$

$X \mid Y=1 \sim \begin{pmatrix} 0 & 1 & 2 \\ \frac{0}{5/18} & \frac{1/6}{5/18} & \frac{1/9}{5/18} \end{pmatrix} \sim \begin{pmatrix} 1 & 2 \\ \frac{18}{30} & \frac{6}{15} \end{pmatrix}$

d) $P(Y \mid X=2) = \frac{P(Y=y, X=2)}{P(X=2)}$

$Y\big|_{X=2} \sim \begin{pmatrix} 0 & 1 & 2 \\ \frac{1/9}{9/36} & \frac{1/9}{9/36} & \frac{1/36}{9/36} \end{pmatrix} \sim \begin{pmatrix} 0 & 1 & 2 \\ \frac{4}{9} & \frac{4}{9} & \frac{1}{9} \end{pmatrix}$

d) 1. NAČIN $E(XY^2) = \sum (i j)^2 \cdot p_{ij} =$

$= 0 \cdot \frac{1}{4} + 0 \cdot 0 + 0 \cdot 1 +$
$+ 0 + \frac{1}{6} + 0 +$
$+ 0 + \frac{2}{9} + \frac{8}{36} =$
$= \frac{1}{6} + \frac{2}{9} + \frac{8}{36} = \underline{\underline{\frac{22}{36}}}$

2\. NAČIN napišem porazdelitveno shemo za $\underline{XY^2}$
⋮

(5) A: $N_A = 100$, $CPI_A = 1{,}2$, $f_{CLK\,A} = 2 \cdot 10^9$ $\qquad$ B: $N_B = 120$, $CPI_B = 1{,}5$, $f_{CLK\,B} = 2{,}2 \cdot 10^9$

$MIPS_A = \frac{2 \cdot 10^9}{1{,}2 \cdot 10^6} = 1666{,}7$ $\qquad MIPS_B = \frac{2{,}2 \cdot 10^9}{1{,}5 \cdot 10^6} = 1466{,}7$

$CPE_{A} = \frac{100}{1666{,}7} = \underline{0{,}0599}$ $\qquad CPE_{B} = \frac{120}{1466{,}7} = \underline{0{,}0818}$

A je boljši procesor

(4) S1: $10 \cdot 10^3$ eur $\qquad$ S2: $15 \cdot 10^3$ eur

P	S1	S2
1	10s	4s
2	3s	5s

a) S1: $\frac{10\,000\text{ eur}}{10\text{s}} = 1000$ eur/s $\qquad$ S2: $\frac{15\,000}{5\text{s}} = 3000$ eur/s

O: $\underline{\underline{S1}}$

b) zmogljivejši: $\underline{S2}$ (P1 + P2 = 9s)
učinkovit: $\underline{\underline{S1}}$: $\frac{10\,000}{13} = 769$ eur/s $\qquad$ S2: $\frac{15\,000}{9} = 1666$ eur/s

c) 3600
S1: posa
t_{P1} = ~~3600~~ 200 · 10 = ~~1800~~ 2000
t_{P2} = 1600
~~v uri~~ ~~v uri~~
$N_{P1} = 200$
$NP_2 = 1600/3 = 533$

$\frac{10\,000}{733} = 13{,}6$ eur/izvajanje

S2:
$t_{P1} = 1000$s
$t_{P2} = 2600$s
~~v uri~~
$N_{P1} = 200$
$N_{P2} = 2600 / 4 = 650$

$\frac{15\,000}{850} = 17{,}64$ eur/izvajanje

zmogljivejši: $\underline{S2}$
učinkovitejši: $\underline{S1}$

VIS VAJE 10

Dodatno

$r(X,Y)$ – nam pove mero linearne odvisnosti med spremenljivkama
$[-1, 1]$
negativna povezava, pozitivna linearna odvisnost (premica)

(1)

$X \backslash Y$	0	1	3	
0	0,05	0,1	0,2	0,35
1	0,15	0	0,15	0,3
4	0,2	0,1	0,05	0,35
	0,4	0,2	0,4	1

$E(X) = 0 \cdot 0{,}35 + 1 \cdot 0{,}3 + 4 \cdot 0{,}35 = 1{,}7$
$E(Y) = 0 \cdot 0{,}4 + 1 \cdot 0{,}2 + 3 \cdot 0{,}4 = 1{,}4$

$E(X \cdot Y) = \cancel{0 \cdot 0{,}05 + 0 \cdot 0{,}1 + 0 \cdot 0{,}2 + 1 \cdot 0{,}15 + 1 \cdot 0 + 1 \cdot 0{,}15 + 4 \cdot 0}$

$E(X \cdot Y) = 1 \cdot 3 \cdot 0{,}15 + 4 \cdot 1 \cdot 0{,}1 + 4 \cdot 3 \cdot 0{,}05 = 0{,}45 + 0{,}4 + 0{,}6 = 1{,}45$

$Cov(X,Y) = E(XY) - E(X)E(Y) = 1{,}45 - 1{,}7 \cdot 1{,}4 = \underline{-0{,}93}$

če je $Cov = 0$ je ne pomeni da sta neodvisni

vendar dokaz da je $E(X) = ...$ to pomeni da sta spremenljivki neodvisna

$r(X,Y) = \frac{Cov(X,Y)}{\sigma(X) \cdot \sigma(Y)} = \frac{-0{,}93}{1{,}735 \cdot 1{,}356} = \underline{-0{,}4}$

$\sigma(X) = \sqrt{D(X)}$

$D(X) = E(X^2) - E(X)^2 = \cancel{1^2 \cdot 0{,}3 + 4^2 \cdot 0{,}35 = 5{,}9}$

$E(X^2) = 1^2 \cdot 0{,}3 + 4^2 \cdot 0{,}35 = 5{,}9$

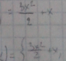
$D(X) = 5{,}9 - 1{,}7^2 = 3{,}01$

$\sigma(X) = \sqrt{3{,}01} = \underline{1{,}735}$

$E(Y^2) = 1^2 \cdot 0{,}2 + 9 \cdot 0{,}4 = 3{,}8$
$D(Y) = 3{,}8 - 1{,}4^2 = 1{,}84$

$\sigma(Y) = \sqrt{1{,}84} = 1{,}356$

(2) $p_{X,Y}(x,y) = \begin{cases} 3(x^2y + xy^2); & x,y \in [0,1] \\ 0 & ; \text{sicer} \end{cases}$



~~Cov(X,Y) =~~

• $p_X(x) = \int_0^1 3(x^2y + xy^2)\,dy = \frac{3x^2y^2}{2} + \frac{3xy^3}{3}\Big|_0^1 = \frac{3x^2}{2} + x$

• $p_Y(y) = \begin{cases} \frac{3y^2}{2} + y, & y \in [0,1] \\ 0, & \text{sicer} \end{cases}$ $p_X(x) = \begin{cases} \frac{3x^2}{2} + x, & x \in [0,1] \\ 0, & \text{sicer} \end{cases}$

• $E(XY) = \int_0^1\int_0^1 x \cdot y \cdot p_{X,Y}(x,y)\,dx\,dy =$
$= \int_0^1\int_0^1 3xy(x^2y + xy^2)\,dx\,dy = \int_0^1\int_0^1 (3x^3y^2 + 3x^2y^3)\,dx\,dy =$
$= \int_0^1 \frac{3x^4y^2}{4} + x^3y^3 \Big|_0^1 dy = \int_0^1 \left(\frac{3}{4}y^2 + y^3\right) dy = \frac{3}{4}\frac{y^3}{3} + \frac{y^4}{4}\Big|_0^1 = \frac{1}{4} + \frac{1}{4} = \underline{\frac{1}{2}}$

• $E(X) = \int_0^1 x \cdot p_X(x) = \int_0^1 x\left(\frac{3x^2}{2} + x\right) = \int_0^1 \left(\frac{3x^3}{2} + x^2\right) dx = \frac{3x^4}{8} + \frac{x^3}{3} = \frac{17}{24}$

• $E(Y) = E(X)$ – ker imata obe enako gostoto

• $E(X^2) = E(Y^2) = \int_0^1 x^2 p_X(x)\,dx = \underline{\frac{11}{20}}$

• $D(Y) = D(X) = E(X^2) - E(X)^2 = \frac{11}{20} - \left(\frac{17}{24}\right)^2 =$
$= 0{,}0482\underline{6}$