3.9.18

$a = 12$ $a = (14, 11, 17)$

$b = 12$ $b = (13, 16 21)$

$a * b = 29$ $a + b = (182, 176, 799)$

Ordinary
for $i = 1$ to m
  for $j = 1$ to n
    $c[i,j] = a[i,j] + b[i,j]$

Vector
for $i = 1$ to m
  $c[i,:] = a(i,:) + b(i,:)$

for $i = 1:1:m$

Matrix multiplication
Complexity $\rightarrow$ $m \cdot n \cdot r$ (ordinary)

for $i = 1:1:m$
  for $j = 1:1:r$
    $t = 0$
    for $k = 1:1:n$
      $t += a(i,k) * b(k,j)$
    $c(i,j) = t$
  end
end

$c -= 2$

$c = +2$

$[y = c', i]$

$n^2 \rightarrow r$

* matrix multiplication vector processing

for i = 1:1: m

    p = a[i, :]

    for j = 1:1: r   Complexity $m(r+n)$

        k = b[:, j] —

        u = p *. k $\nearrow$
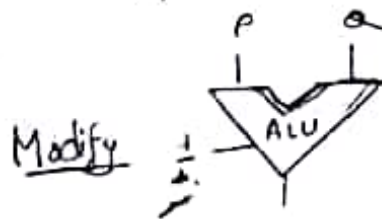
        d(j,:) = u ,

    end

end   e = d ; x = e(1,:);

    for j = 2:1: n

        x = x + e(j,:)

    c(i,:) = x

Modify

to allow parallelism

merge two sorted arrays.

⇒ Merge two sorted arrays

G P = [14, 17, 29, 36, 42, 58]
H Q = [18, 31, 33, 35, 50, 60]

A: 14, 29, 42   C = 17, 36, 58
B: 18, 33, 50   D = 31, 35, 60
                       merge → 17, 31, 35, 36, 58, 60
merge → 14 18 29 33 42 50   even posn
        odd   posn

[14   18   29   33   42   50   ]

$T(n) = T(n/2) + 1$
        ‿‿‿   ‿‿‿
       parallel   show?
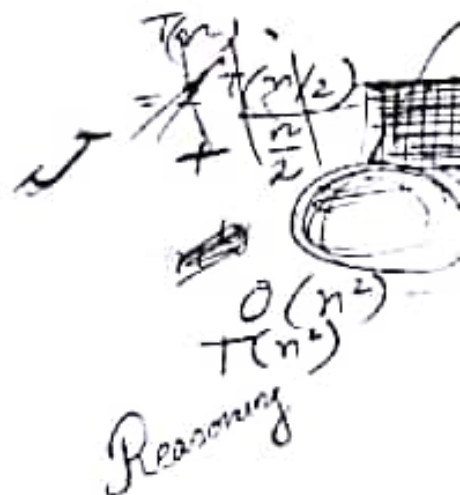
Y(1) = [] I = [18, 25, 33, 42, 50]
Z(6) = [] J = [17, 31, 34, 36, 58]
K = Min(I, J) = [17, 29, 33, 36, 50]
L = Max (I, J) = [18, 31, 34, 42, 58]
Shuffle (K, L)
14 [17, 18, 29, 31, 33, 34, 36, 42, 50, 58] 60

Reasoning

$$J = \sum f(n/2) + \frac{n}{2}$$

$O(n^2)$
$T(n^2)$

Given a claim
try to disprove
(find a counterexample)

for each counterexample
see how they deal with
it, then modify your
counter example
exhaust   "   to
satisfy the reform of the
proof

'Sum of elements of vector.

vector also can also → Find length

→ div
→ Find elements al ure of indices

$n = $ length (T)

while $(n > 1)$

~~$n = $ length (F)~~

$k = $ div$(n, 2)$

$J = 1 : 1 : k$ $[1, 2, 3, 4]$

$A = T(J)$ $[15, 11, 17, 19]$

$B = T$

$B(J) = [\ ]$ $[41, 32, 36, 84]$

$T = A + B$.

$n /= 2$

end.

$2^n \rightarrow$

minute

$7 - [\ ] \rightarrow$

4.9 18

z \ xy	00	01	11	90
0	0	1	0	0
1	0	0·	0·	0

$x'=0 \; y=1 \; z=0$

$\not{g} \; x'yz'$ product

$\dfrac{a \cdot b}{\not{g} \; b}$

z \ xy	00	01	11	90
0	1	0	1	1
1	1	1	1	1

0 when $x=\bar{0} \; y=1 \; z=0$

$x'y z'$ is zero·

$(x'yz')'$ is 1·

$x+y'+z$ • sum.

$a + bc$

$(a \cdot b)'$

$be-pa$

$(b+a)($

Sum of product

$x'yz' + xyz$

$= y(x'z' + xz) = y(x' \oplus z)$

z \ xy	00	01	11	90
0	0	1	0	0
1	0	0	1	0

z \ xy	00	01	11	90
0	0	1	1	0
1	0	0	0	0

$x'yz' + xyz'$ Sum of product

$= (x+x')yz'$

$= yz'$ product

$axy' + y'x + xyb$
$+ y'x$

y \ x' •	0	1
0	a	1
1	0	b

$= \not{g}y'(x+a)$ OR
$+ \not{g}x(y'+b)$
$= ay' + xy' + bx$

az \ xy	00	01	11	10
00	0	0	1	0
01	0	0	0	0
11	0	0	0	0
10	0	1	1	0

$x-1 y=0$

Direct $xyz' + x'yz'a$

$= yz'(x + x'a)$

$= yz'(x+a) \checkmark$

z \ xy	00	01	11	10
0	0	a	1	0
1	0	0	0	0

z \ xy	00	01	11	10
0	0	1	ϕ	0
1	0	0	0	ϕ

z \ xy	00	01	10	11
0	0	1	1	0
1	0	0	0	0

— make 1

— make 0

reduce size of exp

y \ x	0	1
0	0	c
1	0	d

zw \ xy	00	01	11	10
00	1	1	0	0
01	1	1	1	1
11	0	0	0	1
10	0	0	0	0

z \ xy	00	01	11	10
0	1	0	1	1
1	1	1	0	1

$y' + x'z + xz'$

Product of :

$(x + y' + z)(x' + y' + z')$

if a and b cannot be open together, (xy') not needed if .

$$ay' + bx (+xy')$$

K-map top:

y \ x	0	1
0	a (0)	1 b
1		

y \ x	0	1
0	a	a+b
1		b

If a, b cannot be closed together ?

→ Ans: $cy + xyd$

when $c \to d$

y \ x	0	1
0	0	c
1	0	d

c	d
1	1
0	1
0	0

cd \ xy	00	01	11	10
00	0	0	0	0
01	0	0	1	0
11	0	0	1	1
10	∅	∅	∅	∅

xyd
$+$ cx

N.9.18 → 04
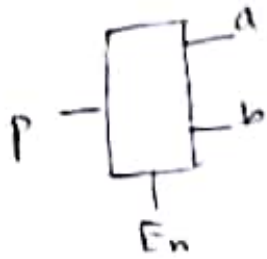
$E_n = 1$

P	a	b
0	1	0
1	0	1

$E_n = 0$ $a = b = 0$

$E_n = 1$
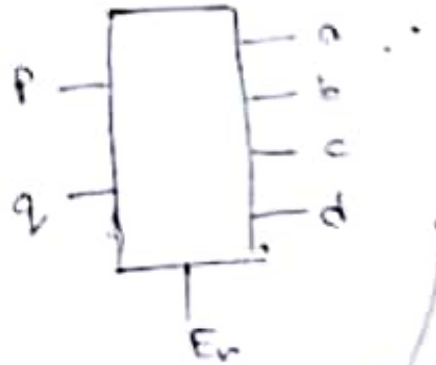
P	q	a	b	c	d
1	q	1	0	0	0
0	0	0	1	0	0
0	1	0	0	1	0
1	0	0	0	0	1
1	1	0	0	0	

$E_n = 0 \to a = b = c = d = 0$
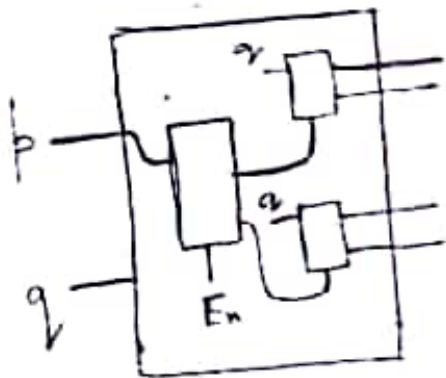
MIDSEM   ASSIGNMENT 1 TYPE

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