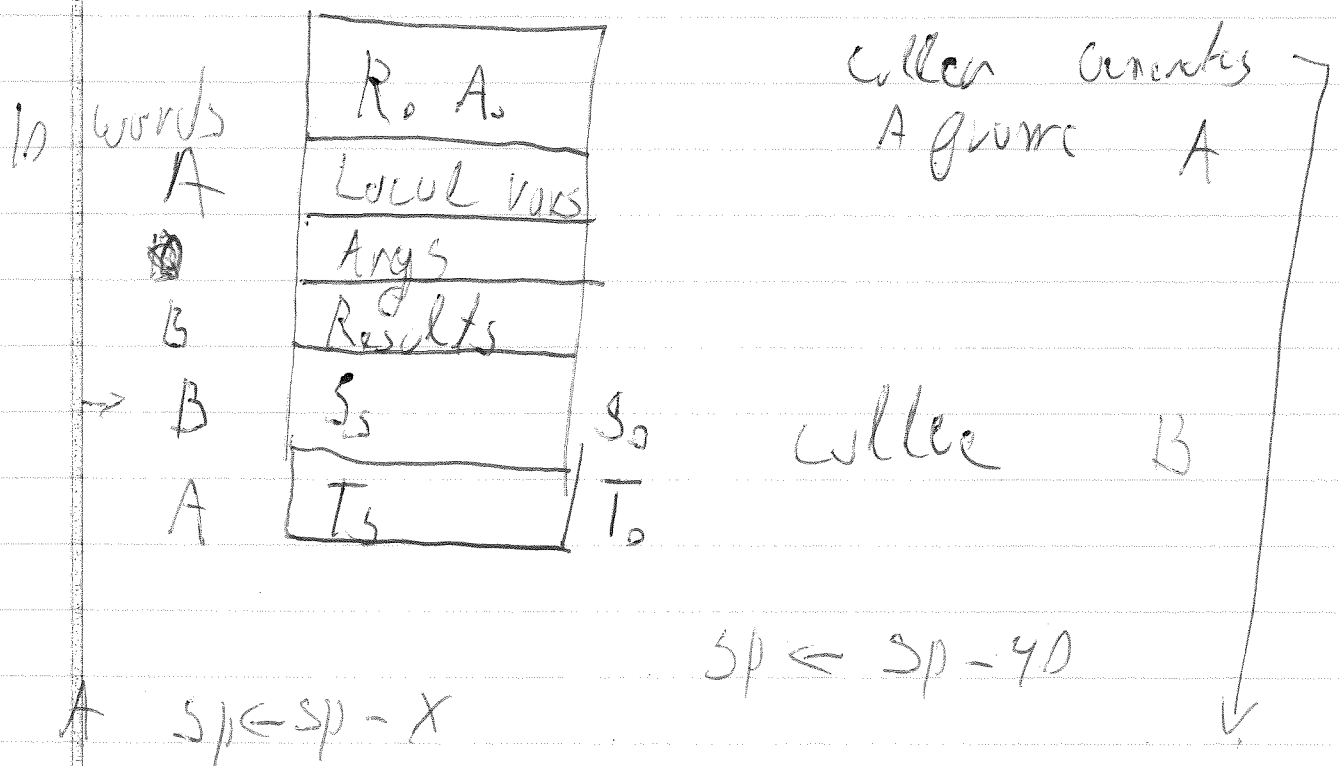


CS2578

10/20/2016

Function call using the stack

Assume a frame of "interface"



SW (R, A) Local's Args T₃

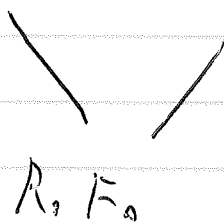
~~SW~~ B LW Args ~~SW~~ SW (R, A) S₃

LW RA if C is 0 else

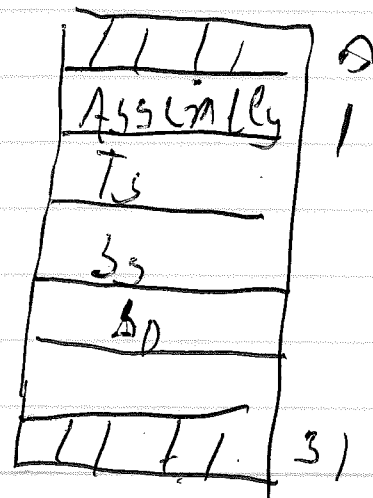
2

LW Hi, 0(\$5)

LW \$R1, 0(\$R2)



R.F.



R.F.

SWAP \$R0, \$R1

Use a Temp

XOR

~~SWAP~~

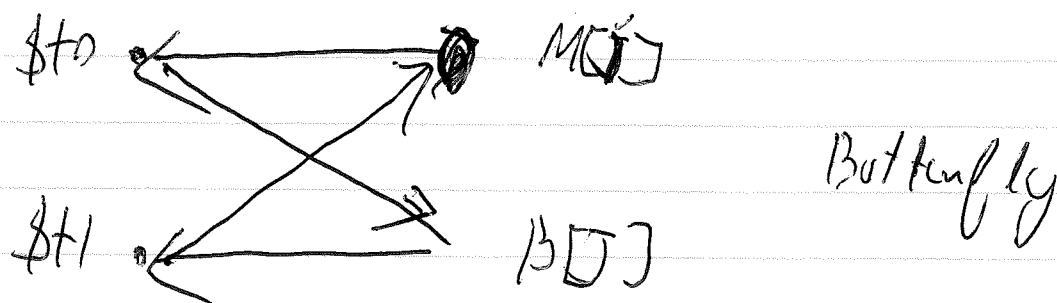
SWAP M[i], ^B~~M[j]~~ No Temp Register

Assume a pointer to M[i], in \$s0

a pointer to M[j] in \$s1

Only Use \$t0, \$t1

3



LW

Contains

\$s0 points to ~~the~~ $M[i]$

Swap $M[i], M[i+1]$

$\$s0 = \&M[i]$ $\$s1 = i$

Only use $\$t0$, $\$t1$ & $\$t2$ for
pointer arith statically.

Dynamically

set $\$t2, \$s1, 2$ $i \leftarrow i + 4$

add $\$t2, \$s0, \$t2$ $\$t2 \leftarrow \&M[i]$

LW $\$t0, 0(\$t2)$

SW $\$t1, 4, (\$t2)$

4

SW \$t0, 4(\$t2)

~~Or~~ LB SB

SW \$t1, 0(\$t2)

~~Or~~

LW \$t0, 0(\$t2)

addi \$t2, \$t2, 4

LW \$t1, 0(\$t2)

~~subi \$t2, \$t2, 4~~

SW \$t0, 0(\$t2)

subi \$t2, \$t2, 4

SW \$t1, 0(\$t2)

SLT

MACHINER
ADDRESS

R
I
J

- Only discussed odd, sub etc

— BEQ BNE

addi ori ... SLTI

SW, LW

J JAL

5

Types of change of flow

A conditional
on 11

B Relative to pc

Absolute

ABCD1234 J out

AXXX XXXX

B 000 0000

RANGE

BEQ

Real

pseudo

J JAL

JR

B B out

Barion

Patterson 2

1, 2 3, 4

3 directives

4

J JAL

segment

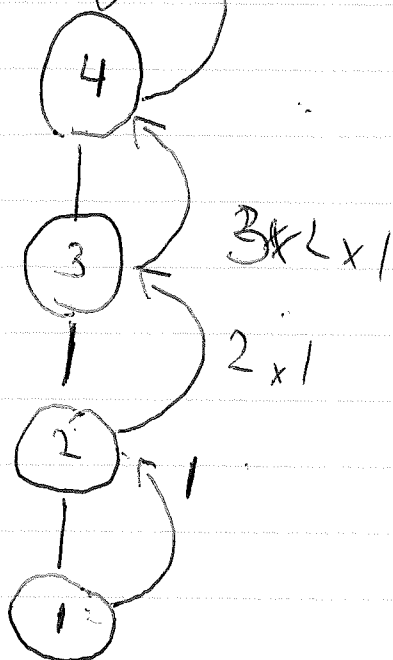
6

8

Factorial (4)

main

called from main

generated by
work or caller frame of 4

4

called caller frame
for 3

3

called frame for <

2

$$F_n = F_{n-1} + F_{n-2}$$

~~$$F(2) = 0 \quad F(1) = 1$$~~

$$F(0) = 0 \quad F(1) = 1$$

input n output F_n