本节主题

MIPS指令简介

北京大学。嘉课

计算机组成

制作人:连续旅





MIPS指令

COCK NUMERICATION ECC. COCK	-	Ref	er	once Data	- 6	3	NAME ADMINISTRATION OF STREET
Pack	CORE INSTRUCTI					OPCODE	much contribute to the or directing of the contribute of the contr
Add team-time						PENCT	
Add temodom							
Add trangened	7.75		-				FFAMINGS on FE 1982; 1981 - 1981 10
Add transper						-	
### Process Figure Figure				Cold Cold Cold Cold Cold Cold Cold Cold	(2)		resident (c)
March Co. Topad						Di Th	PPCUMpale FROM: CPDIALED III op 11
March Marc					-		Dodler (D) 7 (n
Terrico Terr	And terminalists				181	"Tare	provide stade to a see with pela feels to
Prince Desirate Prince	Trench On Topal	mq	٠	PC-PC+4-Hopelinds	$ 4\rangle$	*	(7 Decile : 19 (19 (19 (19 (19 (19 (19 (19 (19 (19
Process	Street On Not Depail	loe.	3.		145	Nex	Principly single Fill ASSE- Fells * ASSE: 10
Description	temp		8		(20)	San	example tel (algitalped) - (algitalped) . 12
Section Sect			1	RDID-PD-REPO-IMMANN	(2)	Ann	
Description	Jump Kaylater	10		PC N(N)		01100pg	er salesast (reft)_r(th-t) = (reft)_r(th-t)
Designed	Load Byte Unsigned	Her			(2)	$24_{\rm ho}$	Load PF Single (+= 1 F(M)-MPE(M)-Signification (1) TV
Load Limited		law-	1			$20_{\rm ho}$	Und FF Lind Part M(R(m) Signification) (T) 29
Load Support bases			1				Mayor From St. 100 III R. 2010 - 16 ST.
The column					(417)	-	
Sec					-		
					549		Ability Uniqued access 8 (Billio) - 8014 * 8089 (6) 00
						ALC: The	Shift Right Arth E. Hjoh - Hjirj vor shaet
Delication Del					100		A STATE OF THE PARTY OF THE PAR
Part Color Part Color Part Color Part Color Part Color Part Part Color Part Part Color Part							
Post			7.1				
Mark Company Mark Company Mark Company Com	Set Less Than I men.		+	Highly (Right) + High Extrem)		111	
Section Sect		-244				scatte.	at Comple I for I & I months
See Part P	stick tell topical	ACC.				6/10 _{bm}	7 37 78 77
MANUAL M		mil.		$R(m) = R(m) \Rightarrow sharet$		61 Rham	PSEUDONSTRUCTION SET
	more myter	art.	0	NERSO Manufacture (Tri) - Rens (Tri)	(0)		Transit Less than his stranger-april 90 - Label
	mechanical	*1	*	3(8) - (money 7 1 - 1)	(2.7)	$m_{\rm tot}$	french Lens Chars or Diguid all Rights - Report - Label
Subsect = 1 NAISPO-HIGHENDRISE (N.E. CALL CONVENTION Subsect 1 NAISPO-HIGHENDRISE (N.E. CALL CONVENTION Subsect 1 Naispo-Highendrise 1 Naispo-Highendrise		417	1	alializa iii			Load troodian is apply innelian
		-					
Substant Lineage April A					(77)		
23 Sight voltans 1 to interediate 17 E, squeediate 18						617 Nan	NAME NUMBER 1788 A CALL?
C1 Articlature 16 16 16 17 17 18 18 18 18 18 18							Serio I SSCC-MONEYMACT N.A.
(4) serges-Scale (**) (**) (**) (**) (**) (**) (**) (**		(3) zán	ebide	mm - IA Ib U , mondate			had one for transition thereoffer
(*) Average and (**) CPC**4(*) Fig. Authors, Find (*) CPC**4(*) CP						1901	
(1) Animals translated pair; April 1 if pair animal, 6 if Ani animal \$0.001 6.11 Tategorapus \$16 BASIC INSTRUCTION FORMATS \$10.001 \$10.001 \$10.001 \$10.001		(1) April	pad m	 (versage) ring, address, 2 % (versage) reprint (versage) 	1	(men	Sult Sult — 6.7 Arguments — Six
BASIC INSTRUCTION FORMATS En SET 19 20 Set of Temporarios Tol							\$6-\$7 8-15 Temperaries No.
	R Speeds			# 1 of share	7	funct	\$60 \$50 \$5.50 Telephonesis 500 \$60 \$61 \$6.27 Reserved for Oil Kamed 500
t stock n n n structure no structure	2		_		-64-		Tap 21 Clotal Points Tox

Copyright 2009 by Elizabet, Inc., All rights reserved trans Patterns and Demony, Computer Organization and Design, 4th ed.

49F	TIT MEET			theil.		ANCH	facil.	THE	ASCI
poniki	Tutor	Best	HIME'S	mail	an.	Clar	mai	(Sept.	Chir.
11.342	(910)	17.79			1946	Activi		mat	pulse?
77		and I	100	-	_	THE	-34		2
		J.com	(6)	1	- 1	800	47	41	- 75
	***	=3	NC 00 11	3	- 3	MYK	96	142	- 91
101	2019		100-00111	-		HTX	47	42	- 45
	bild.	100	RC-01101	3	- 1	1010	-	- 40	-
ine.	Arres :	37	INC-01111		- 1	ALK	- 50	Ãi.	
100	-	-	100-6111	- 3	- 3	1003	-71	45	- 6
-	100		100 LINE	-	$\overline{}$	BA.	11	-	-11
	lai-		Sec Anni	- 1	- 1	HT	. 13	40	· ï
des.	-		G 1111		-	1.6	19	-	- 1
4114	-		100 1111	11	- 6	VT	-	-	- 6
200	90976	THE A	19 TO	- 17	-1	10	-	- 6	+
0.5	Access to	11:011.30	500 1101	13	è	CIE	- 22	44	- M.
mrs.		19911 36	30 tres	314		901	19.	-	79
	burne	tions of	199 1111	15	- 1	10	19	40	.0
	475		SEC. COME	-14	- 11	DUE	N)	- 55	7
70	4040		Int. Seen	北北	8.0	1300	9.0	2.5	. 9
	4016	month.	EX.0618	18	12	DCS	83	33	- 10
	della.	street,	10,0001		3.0	1800	83	29	. 1
			at tem	. 74	1A	18.4	- 84	- 29	1
			ET 6081	21	10	74.5.8	10	99	- 61
			lat Octob	22	16	9776	36	50	ž
	900		DEC TONS	-3	-ii	THE P	- 87	-6	÷
	milita-		E 100	25	- 11	PM.	10	70	
	4514		G 1010		14	2130	m	Ta.	ż
	2025		100	- 77	- 6	Abc:	111	- 55	
_			100 1100	- 14	-	10	-	-6	-
			OC 1000	29	16	618	123	- 50	1
			in the		0.0	10.0	94	240	
			m) 6111	28	46	6.06	107	100	
-	111	201.12	TO CHILL	-32	-27	Tpics	-	- W	
	0.750	ion of	10.0001	2.5	21		915	160	
wil	9100		14 000		300	* :	-000	42	. %
	REST		19-0011		_25		99	62	. 8_
71	917	contract to	12 (12.00)	79	71		710	8.5	
	440		10-0181	27	31	16	111	68	1
91	411		10.0111	74	78 27		1007	4/7	
_	10-0		HI YANG	- 6	- 25	_	100	-1	+
				41	29	1	148	40	- 1
	311		10 1030		24	- 4	100	Fig.	- 1
-	#174 C		19 2011	- 60	- 29	- 32	100	- 0	- 6
_			10 110	- 11	- 5	_	110	60	+
			100 1100	- 61	34		104	44	
m t			100 1000		35		110	- 10	
-			18 1111	47	- 22	- 11	111	44	
_	Calif	1.15	tindes:	-31	-31	_	115	-10	- 1
met T	Ages -	- ml	11 900	-016	20	1	0108	. 15	4
wit.	4.16	175	11,0639		30	2	114	11	- 6
mad .	boths.		11.0001	. 31	30		319		
	100	Street Co.	17 0100	-11	31	-	779	74	-
-		2110 m	13:0000	27	303	2.	117	79	
and I	0.000	a-read	11.00.08		744		110	16-	*
		Lill.	21.4000	55	31	- 7	119	_22	
		0-16-2	11.100	- 24	.39	-	130	-11	. 1
m 11		2.29 (4.5	11 9600	- 27	36		103	19	. 3
m.Z		a west	11 3600		34.		613	- 31	- 8
		L-My	11,460.0	- 115	-39	-	553	- 5	_
		2.00	11.1100	80	- 5		120	- 3	
der E		2-10/	17.1000 15.1000	85	36	-	110	10	-8
		0.10.		4/3	Asi		tin co		

-111	-documents	1.36) =						
(0)	opiosite(1	1340-1	: I'len	05443	E Bes(27),210-	-Office ()	March 1	r p (Hitght)
	of Beauty	21)=1	See (1	See 1/=	- (habb)			

EEE 754 FLOATING POINT STANDARD			SIL	(E) 754 Sym	hole
West of the second seco		Tips:	mar.	SUPPLY STATES	170000
$(-1)^{2r} \times (3 + Frankov) \times 2^{(1)} Frankov History$				9.	+1
where tingle Procision Star + 125.	- 1			941	4 DWG
Double Precision State - 1977	- 1	TUNE	33.11	arythiag	1 PL PC 10
	- 1	- 10.		- 19.	
KLK Single Presision and	- 1	. 181		#3J	795
Double Precision Formats:	:17	20.6	EASE IN	35, 15, F 3	XXX-38
n toposes		PRO	in		
S Depotent of a		-	men.	16	÷
MEMORY ALLOCATION	18	TACK	FTRAM		and the later
Sep - 78f Ship.	11	in-	Atte		200676
Table State		tur .	100	Vetaltine	Christia
to the later of th	2 30	No.	1		Long

ERCEPTION CONTROL REGISTERIS, CALISE AND STATUS

Strengt Soughts

Made Color

Nating CV STT

HER T HOUSE Dielog Libe T Goe Mode, HE T Brooghist Level, HE Tomortogi Anable CNITE ETTOM COOKER

300	7-ame	Class of Encighera	FramPa	F.74(attion	Cause of Encaption
	100	Marriage (Nationalis)		TV.	PENSIPATE ENCIPTION
4	Alles	Address Torre Exception (final or Instruction Secto	100	91	Exception
8	ABIN	Aldrea from traceptore (store)	18	the	Cognicional Connectionarial
	JARL	mar time on testration trock	ш	(De	Archeolic Unorthea Enception
2	1mm:	Load or more	12	711	Trep
-	744	Tax of Taxables	-	*****************	Physical Panel Physics.

SIZE PREFIXES (10⁴ for Disk, Communication; 2⁶ for Memory)

NACH	PER.	ALC:	FOX.		HIA.		FOR
19 ³ , Y ² 4	Kilm	1911, 724	Prince	107	mil-	18-11	famin-
100,200	Migo	1611, 240	Tite-	10.0	micm-	28,11	attr-
10", 3"	Chiga-	160,170	Tirtle.	311.0	Antes	38.11	replic
11/27, 1 40	Ties	1977, 781	THE	18.00	251	30,34	gesta

Copyright 3064 by Slamice, Inc., All rights meaned. From Patieron and Hennicey, Computer Objects and Elergie, 4th ed.

MIPS Reference Data Card ("Green Card")

MIPS指令的基本格式

▶ R: Register, 寄存器

❷ I: Immediate, 立即数

● J: Jump, 无条件转移

R	opcode		rs		rt			rd	shamt		funct	
	31	26	25	21	20	16	15	11	10	6	5	0

1	opco	de		rs		rt		immediate	
	31	26	25	21	20	16	15		0

J	opc	ode		address	
	31	26	25		0

不同维度的指令分类(示例)

运算指令	add rd, rs, rt sll rd, rt, shamt	addi rt,rs,imm slti rt,rs,imm	
访存指令		lw rt, imm(rs) sw rt, imm(rs)	
分支指令	jr rs	beq rs, rt, imm	j addr
	R型指令	I型指令	J型指令

R型指令的格式(1)

- № R型指令格式包含6个域
 - 。2个6-bit域,可表示0~63的数
 - 。 4个5-bit域,可表示0~31的数

用于指定指令的类型。对于所有R型指令,该域的值均为0

5-bit

opcode

R

6-bit

思考:

5-bit

为什么不将opcode域和 funct域合并成一个12-bit 的域?

与opcode域组合,精确 地指定指令的类型

5-bit

funct

6-bit

_		-	`										
	opcod	de		rs		rt		rd	sh	amt	1	funct	
	31	26	25	21	20	16	15	11	10	6	5	0	

5-bit

R型指令的格式(2)

- rs Source Register
 - 。通常用于指定第一个源操作数所在的寄存器编号
- rt Target Register
 - 。通常用于指定第二个源操作数所在的寄存器编号
- rd Destination Register
 - 。通常用于指定目的操作数(保存运算结果)的寄存器编号
- № 5-bit的域可表示0~31,对应32个通用寄存器

	6-bit		5-bit				5-bit			5-bit		5-	bit	6-bit		
R	opcode		rs				rt			rd		shamt		funct		•
	31	26	25		21	20		16	15		11	10	6	5		0

R型指令的格式(3)

- shamt shift amount
 - 。用于指定移位指令进行移位操作的位数
 - 。5-bit的域可表示0~31,对于32-bit数,更多移位没有实际意义
 - 。对于非移位指令,该域设为0

	6-bit			5-bit			5-bit 5-bit			5-	bit	6-bit						
R	opcode		e rs			rt				rd		sha	amt	f	funct			
	31	26	25		21	20		16	15		11	10	6	5		0		

R型指令的编码示例

- add \$8,\$9,\$10
 - 。 查指令编码表得到:

```
opcode = 0 , funct = 32 , shamt = 0 (非移位指令)
```

。根据指令操作数得到:

	0000	00	0	1001		0	1010	0	0	1000)	000	000	1	00000)
R	opcode			rs			rt			rd		sha	amt		funct	•
	31	26	25		21	20		16	15		11	10	6	5		0

不同维度的指令分类(示例)

运算指令	add rd, rs, rt sll rd, rt, shamt	addi rt,rs,imm slti rt,rs,imm	
访存指令		lw rt, imm(rs) sw rt, imm(rs)	
分支指令	jr rs	beq rs, rt, imm	j addr
	R型指令	型指令	J型指令

I型指令的格式(1)

- ▶ R型指令只有一个5-bit域表示立即数,范围为0~31
- 常用的立即数远大于这个范围,因此需要新的指令格式
- ▶ I型指令的大部分域与R型指令相同

	6-bit		5-bit			5-bit				16-bi	t		
ı	opco	de		rs		rt			i	mmedi	ate)	
	31	26	25	21	20	16	15						0
	6-bi	t		5-bit		5-bit		5-bit		5-bit		6-bi	t
R	opco	de		rs		rt		rd		sham	t	func	t
	31	26	25	21	20	16	15	,	11	10	6	5	0

I型指令的格式(2)

- opcode
 - 。用于指定指令的操作类型(但没有funct域)
- rs Source Register
 - 。指定第一个源操作数所在的寄存器编号
- rt Target Register
 - 。指定用于目的操作数(保存运算结果)的寄存器编号
 - 。 对于某些指令,指定第二个源操作数所在的寄存器编号

	6-0	DIT		5-DIT			5-DIT			16-bit	
ı	opco	ode		rs			rt			immediate	
	31	26	25		21	20		16	15	C)

I型指令的格式(3)

- immediate
 - 。16-bit的立即数,可以表示216个不同数值
 - 对于访存指令,如lw rt,imm(rs)
 通常可以满足访存地址偏移量的需求(-32768~+32767)
 - 。对于运算指令,如addi rt,rs,imm 无法满足全部需求,但大多数时候可以满足需求

	6-DI	JΙ	•	JIG-C		,	JIG-C			71 0- 017	
I	opco	de		rs			rt			immediate	
	31	26	25		21	20	,	16	15		0

I型指令的编码示例

- addi \$21,\$22,-50 # \$21=\$22+(-50)
 - 。 查指令编码表得到:

```
opcode = 8
```

。分析指令得到:

```
rs = 22 (源操作数寄存器编号)
```

immediate = -50 (立即数)

001000 10110 10101 1111 1111 1100 1110

I	opco	de		rs		rt		immediate
	31	26	25	21	20	16	15	0

不同维度的指令分类(示例)

运算指令	add rd, rs, rt sll rd, rt, shamt	addi rt,rs,imm slti rt,rs,imm	
访存指令		lw rt, imm(rs) sw rt, imm(rs)	
分支指令	jr rs	beq rs,rt,imm	j addr
	R型指令	I型指令	J型指令

分支指令的分类

Branch

。分支:改变控制流

Conditional Branch

。 条件分支:根据比较的结果改变控制流

。两条指令:branch if equal (beq); branch if not equal (bne)

Unconditional Branch

。非条件分支:无条件地改变控制流

。 一条指令: jump (対)

条件分支指令(I型)

条件分支

```
o beq rs,rt,imm
```

• bne rs, rt, imm

```
# opcode=4
```

opcode=5

❷ 格式:beq reg1,reg2,L1

```
if (value in reg1) == (value in reg2)
  goto L1
```

	6-	bit	į.	5-bit	,	5-bit		16-bit
1	opc	ode		rs		rt		immediate
	31	26	25	21	20	16	15	0

条件分支指令的示例

```
if(i==j)
    f=g+h;
else
f=g-h;
```

C语言代码

```
beq $s3,$s4,True  # branch i==j sub $s0,$s1,$s2  # f=g-h(false)  # goto Fin

True: add $s0,$s1,$s2 # f=g+h (true) Fin: ...

MIPS汇编语言代码
```

条件分支指令的目标地址范围

- № 如何充分发挥16-bit的作用?
 - 。以当前PC为基准,16-bit位移量可以表示±2¹⁵ bytes
 - 。MIPS的指令长度固定为32-bit (word)
 - 。16-bit位移量可以表示 ±2¹⁵ words = ±2¹⁷ bytes (±128KB)
- 目标地址计算方法:
 - 。分支条件不成立,PC = PC + 4 = next instruction
 - 。分支条件成立, PC = (PC+4) + (immediate*4)

	6-D	TI	,	JIG-C		,	5-DIT			16-bit	
ı	opco	ode		rs			rt			immediate	
	31	26	25		21	20		16	15	0	

非条件分支指令(J型)

- 在不需要条件判断的情况下,如何扩大目标地址范围
 - 。理想情况,直接使用32-bit地址
 - 。冲突:MIPS的指令长度固定为32-bit, opcode占用了6-bit
- 目标地址计算方法:

 \circ New PC ={ (PC+4) [31..28], address, 00}

6-bit

26-bit

J	opcode	address												
	³¹ 6-bit ²⁶	²⁵ 5-bit	5-bit	16-bit	0									
ı	opcode	rs	rt	immediate										
	31 26	25 21	20 16	15	0									

两种分支指令示例

❷ 假设变量和寄存器的对应关系如下

$$f \rightarrow \$s0$$

$$g \rightarrow \$s1$$

$$h \rightarrow \$s2$$

$$i \rightarrow \$s3$$

$$j \rightarrow \$s4$$

$$if (i == j)$$

$$f = q + h;$$

else

$$f = g - h;$$

非条件分支指令(R型)

- ▶ J型指令的目标地址范围: ±2²⁸bytes(±256MB)
- ❷ 如何到达更远的目标地址
 - 。2次调用 ;指令
 - 。使用jr指令:jr rs

	6-bit		5-bit		5-bit		5-bit		5-	bit		6-bit		
R	opcode		rs			rt			rd		sha	amt		funct
	31 26		25	21	20	1	6	15		11	10	6	5	0
	6-b	it						2	6-bit	- -				
J	opco	de						ado	dres	ss				
	31 26 25												0	

MIPS指令

١	MIPS	Re	fer	ence Data	6		ARTHWETC CORE INSTRUCTION SET (2) ORC. FINA. NAME, INFORMATION MAY OPERATION (2)
	DORE INSTRUCT					OPCODE	much in its true on it. It if the authorized to the control of the
			FOR			PENCT	Strands Co. FF False
	NAME, MUDICION		MED!			(1001)	Creside Cresident and R. Landing (Ref. No. 40 professional Sci. 40. 10. 10. 10. 10. 10. 10. 10. 10. 10. 1
	Add Add teamsdate	man.	*	Rind - Nini + Rini		\$1.300pm	PFAMINGS on a PK 1932 (-195) - 1951
		and the		Clark the second second	(1,2)		crade and the [Mediale-1] - Medialegani - 100
	Add trees. Strongword Add transport	ACTOR.	1	H(H) - H(H) + Digelistines H(H) - H(H) + H(H)	(2)		Printed (P(S) Printed (P(S) printed (S) Printed (P(S) prin
	had					6/33 _{box} 6/33 _{box}	PPCIMIDARY
		and.		$R(m) = R(m) \triangleq R(m)$	-		Dodin (BELDE-US71))
	rod remeliate	pent	1	ethal - ethal w trempatame	(0)	Clare	* (7 fe = 1, 10, 20 to) (april: 1, ar = 1) (pie Xi, te, ar in) Protecule taugle done are replic reflig (refli) (10)
1	treach On Topal	mq	٠	400pm - 4040 PC-9C+4-Hopelinds 704pm Notes	$ 4\rangle$	*	P Devile (1986) - 1 (1
	Deputs On Not Digus	fice.	3.	PC-PC-4-Branch Addr	145	Nex	Principle Study Fill Hills - Hil
	nonp		8	PC: Nmp-l-filt	(20)	San	processing and the property of the contraction of t
	Sect best quot	344	1	RCTTS-PC-In/PC-Immodille	(2)	April	Printes ingle en ring-ope ring
	temp daylor	10		HC BURG		01100m	er salvena (eg (leg (lg - eg) (leg (lg - eg) - eg (leg (lg - eg) - eg)
1	and type Unsigned	Her		RDE-(DEMINISTRE) +Representation (THE)	(0)	$24_{\rm ho}$	Lond PF Single First - Sept Significant (D) Till
1	cod indfects	de	1	Hittl-104 BroMikite)		$\mathcal{D}_{\mathrm{loc}}$	Lead FF (in) - Market (in) - Market (in) 20 (in) - Market
١.,	tresigned			+Signiferromig(17:00)	(11)		Myse From 10 and R Right 16 07
	cod Litted		1		(2,7)		More from Lo = in R R[rd] - Lo 6-
	and Typer tone.	144	7	N(H) ~ [1000, 10'50]		See	Mirror From Control 8 (A)(40) CR(N) 24 Middle 8 (A(Loc) R(N) R
	Load Word Nor	14		Hight - MERCHE Gundations	(2)	25/60	Multiply Uniqued accord # (MLLs) - MING # MING (4) MI
		ALC:	*	MHS (KIN) - RIND		6/15	Shift Night Arth 6 Winth - Rint >>> share 9
	OF .			Rindl - Rindl Hirtl		EL LyPIN	Stars FF Single N(E(n) GgsCschool - F(n) (1) 39
	(n)mmodium	400		Rint - Rint Zworzenia	(1)	-	State FF
	let Late Than	-11	*	North - (Mint - Mint) (1) ()		6124 _{box}	
	led Lass Than Inon. Set Lass Than Inon.	4/4/	7	Mari - (Mari - Nigotocomo)* () Mari - (Mari - Nigotocomo)	14 (15)	111	FLOATING FOIRT INSTRUCTION FORMATS
	Creatigned to the Chart Charge	*1110	1	which control control control	(1,4)	No.	FR _ quade Eq. 8 6 5 5 5 5 5 5 5 5 5
	field to be being	201		tod - nyi slaut	-	0/100hm	PI opcole for E consider
	Shirt Right Legisla		÷	Rind - Rind stune		E/ Rham	2 22 22 22
	more myter		ō	MEMINE-Majorination (ET d) - Remit 7:00	m	Pho	PSEUDOMSTRUCTION SET MINISTER COPPRATEIN
	besides on			MIR[n0:SynColons] - RD4);			mouth conservation to appropriate transfer to the conservation to
ď	CHRISTIA	41	Α.	1(8) - (money 11 - 1)	(3.5)	No	from him or than or than a standard to a distinct or a standard than or than a standard to a standard than or than a standard to a standard to a standard than or than a standard to a s
	New Pallwood	417	1	stinitud-splannessing (s. o)	(1)	$2b_{\rm tot}$	Load remain charact logue to the state of logue to the lo
	Store Ward	-		MEETING HERSTEIN STREET	(2)		REGISTER NAME, NUMBER, USE, CALL CONVENTION
	salterant	40		aties - aries - actual	$ T\rangle$	6/22 ₆₀	NAME REMITS LINE PRESERVED ACT
2	subreast Linsigned	attribute.	*			0.717^{200}	A UNIAT
				aid conflow conspices. mass : /, to [monodiate(170], imme	dia.		Serio II The Content Value II N.A.
		(3) 28	ebid	mm - [IA [Ib U], mondate]			Bill I Assembler Perspecting No. No. Values for Experience State De-
				Alle - [14] mesodate(11)], trens		1901	Sec. \$11 2.5 end Expression Evaluation No.
		(3) Por (6) Om	grand Stand	the in property and address of the commence of	1	comp.)	Salt Salt II 7 Arguments Sta
				motivet pair; A(R) :: 1 (Fpair alone)			\$6.97 8-15 Simporation No.
	BASIC INSTRUCT						Edit Edit 16-27 Band Temperatura Vid.
	R. Specie	T :		e e si shaet		Sanct	SM Str. 24-25 temperature for Samuel No.

Copyright 2009 by Elizabet, Inc., All rights reserved trans Patterns and Demony, Computer Organization and Design, 4th ed.

49F	TIT MEET			theil.		ANCH	facil.	THE	ASCI
poniki	Tutor	Best	HIME'S	mail	an.	Clar	mai	(Sept.	Chir.
11.342	(910)	17.79			1946	Activi		mat	pulse?
77		and I	100	-	_	THE	-34		7
		J.com	(6)	1	- 1	800	47	41	- 75
	***	=3	NC 00 11	3	- 3	MYK	96	142	- 91
101	2019		100-00111	-		HTX	47	42	- 45
	bild.	100	RC-01101	3	- 1	1010	-	- 40	-
ine.	Arres :	37	INC-01111	- 1	- 1	ALK	- 50	Ãi.	
100	-	-	100-6111	- 3	- 3	1003	-71	45	- 6
-	-		100 LINE	-	$\overline{}$	BA.	11	-	-11
	lai-		Sec Anni	- 1	- 1	HT	. 13	40	· ï
des.	-		G 1111	100	-	1.6	19	-	- 1
	-		100 1111	11	- 6	VT	-	-	- 6
201	90976	THE A	100 Time	-17	-1	10	-	- 6	+
01	America &	11011.2	06 its	13	à	CIE	- 22	4d	- M.
APS.		19911 36	30 tres	314		901	19.	-	79
	burne	tions of	199 1111	15	- 1	10	19	41	.0
	975		SEC COME	-14	-11	DOL	- All	-35	7
70	4040		Int. Seen	大学	8.0	1300	9.0	2.0	. 9
	4016	month.	EX.0618	18	12	DCS	83	33	- 10
	della.	street, f.	10,0001	118	3.0	1800	83	29	. 1
			at tem	. 74	1A	18.4	- 84	- 29	1
			ET 6081	21	10	74.5.8	10	99	- 61
			lat Octob	22	16	9776	36	50	ž
	900		DEC TONS	-9	-ii	THE P	- 87	-6	÷
	milita-		E1 120	25	- 11	PM.	10	70	
	4514		G 1010	24	14	2130	m	Ta.	ż
	2025		100	- 57	- 6	Abc:	111	- 55	
_			100 1100	- 34	-	10	-	-6	-
			OC 1000	29	16	618	123	- 50	1
			in the	Mile	0.0	10.0	104	240	
			m) 6111	78	46	6.06	107	100	
-	111	201.12	TO CHILL	-32	-27	Tpics	-	- W	
	0.750	ion of	10.0001	2.5	21		915	160	
wil	9100		14 000	316	300	* :	-000	42	
	REST		19-0011	25	_25		99	62	. 8
71	917	contract to	12 (12.00)	79	71	- 1	710	8.5	
	440		10-0181	37	31	16	111	68	1
91	411		10.0111	74	78 27		1007	4/7	
_	10-0		HI YANG	- 65	- 25	_	100	-1	+
				41	29	1	146	40	- 1
	311		10 1030	- 67	24	- 4	100	Fig.	- 1
-	#174 C		19 2011	-0	- 29	- 32	100	- 6	- 6
_			10 110	- 11	- 5	_	110	60	+
			100 1100	41	34		104	44	
m t			100 1000	-	35		110	- 10	
-			18 1111	47	- 22	- 11	111	44	
_	Calif	1.15	tindes:	-31	-31	_	115	-10	- 1
met T	Ages -	- ml	11 900	-016	20	1	0108	. 15	4
wit.	4.16	175	11,0639	23	30	2	114	11	- 6
mad .	boths.		11.0001	. 21	30		319		
	100	Street Co.	17 0100	-11	31	-	779	74	-
-		m. 411Z	13:0000	22	303	2	517	79	
and :	0.000	a read	11.00.05	54	74		110	16	*
		Lill.	21.4000	55	31	- 7	119	22	
_		0.10.2	111.1300	- 24	.39	-	130	-11	- 1
m 11		2.29 (4.5	11 9600	27	36		103	19	. 3
m.Z		a west	11 3600	. 14	34.		613	- 31	- 8
		L-My	11,460.0	- 115	-39	-	553	- 5	_
		2.00	11.1100	60	- 5		120	- 3	
der E		-10/	17.1000 15.1000	61	36	-	115 118	10	-8

-111	-documents	1.36) =						
(0)	opiosite(1	1340-1	: I'len	05443	E Bes(27),210-	-Office (March 1	r p (Hitght)
	of Beauty	21)=1	See (1	See 1/=	- (habb)			

EEE 754 FLOATING POINT STANDARD	SIE	(B) 754 Syn	doube
The second secon	Traponist.	7796-51/6	170041
$(-1)^{D} \times (3 + Exaction) \times 2^{O (British E - 1000)}$		9.	+1
where titude Procision Star + 125,		941	4 CHUIT
Double Precision Star - 1957	THIMBLE IT	arything	1 P. P. S
	MAX	19.	
KLK Single Precision and	3863	#3J	
Double Precision Formats:	EF MAN	DATE:	OXX - 38
n Espaini	Photics		
S Deponent of a	Prestore	_k	÷
MEMORY ALLOCATION	STACK FRAN		and the latest and
Ser - 100 Min.	59 A5		2000
Non-Book State Chile	Local Control	Vetaltine	T
to the same of the	-		Longs

ERCEPTION CONTROL REGISTERIS, CALISE AND STATUS

Strengt Soughts

Made Color

Nating CV STT

HER T HOUSE Dielog Libe T Goe Mode, HE T Brooghist Level, HE Tomortogi Anable CNITE ETTOM COOKER

300	7-ame	Case of Dangeron	FramPa	F.74(attion	Cause of Encaption
	100	Marriage (Navideores)		TV.	PENSIPATE ENCIPTION
4	Alles	Antesia Torrettargenia Cload or Instruction Section	100	91	Exception
8	ABIN	Aldrea terror traceptore (atom)	18	the	Cognicional Connectionarial
	JARL	mar time on testration treat-	ш	(De	Archeolic Unorthea Enception
2	1mm:	Load or more	12	711	Trep
-	744	Tax of Taxables	-	*****************	Physical Panel Physics.

SIZE PREFIXES (10⁴ for Disk, Communication; 2⁶ for Memory)

NACH	PER.	ALC:	FOX.		HIA.		FOR
19 ³ , Y ² 4	Kilm	1911, 724	Prince	107	mil-	18-11	famin-
100,200	Migo	1611, 240	Tite-	10.0	micm-	28,11	attr-
10", 3"	Chiga-	160,170	Tirtle.	311.0	Antes	38.11	replic
11/27, 1 40	Ties	1977, 781	THE	18.00	251	30,34	gesta

Copyright 3064 by Slamice, Inc., All rights meaned. From Patieron and Hennicey, Computer Objects and Elergie, 4th ed.

MIPS Reference Data Card ("Green Card")

本节小结

MIPS指令简介

北京大学。嘉课

计算机组成

制作人:陆俊林



