

## Zbirnik podpira naslednje psevdo-ukaze

<b>.data</b>	- začetek podatkovnega segmenta
<b>.text</b>	- začetek ukaznega segmenta
<b>.code</b>	- začetek ukaznega segmenta (enako kot .text)
<b>.org &lt;n&gt;</b>	- določen začetni naslov
<b>.space &lt;n&gt;</b>	- rezerviraj n lokacij (pusti naključno vrednost)
<b>.ascii &lt;s&gt;</b>	- ASCII niz zaključen z ničlo
<b>.ascii &lt;s&gt;</b>	- ASCII niz
<b>.align &lt;n&gt;</b>	- poravnaj naslov da bo deljiv z n
<b>.word &lt;n1&gt;,&lt;n2&gt;..</b>	- določi eno ali več zaporednih 32-bitnih števil
<b>.byte &lt;n1&gt;,&lt;n2&gt;..</b>	- določi eno ali več zaporednih 8-bitnih števil
<b>.word64 &lt;n1&gt;,&lt;n2&gt;..</b>	- določi eno ali več zaporednih 64-bitnih števil
<b>.word16 &lt;n1&gt;,&lt;n2&gt;..</b>	- določi eno ali več zaporednih 16-bitnih števil
<b>.double &lt;n1&gt;,&lt;n2&gt;..</b>	- določi eno ali več zaporednih 64-bitnih števil v plavajoči vejici (IEEE754)

<n> predstavlja število kot na primer 24

<s> predstavlja niz kot na primer "fred"

<n1>,<n2>.. predstavlja števila ločena z vejicami.

### Formata ukazov procesorja HIP

Format 1:

31	26	25	21	20	16	15	0
Op. koda		Rs1	Rd	Takojšnji operand ali odmik			
6		5	5	16			

Format 2:

31	26	25	21	20	16	15	11	10	0
Op. koda		Rs1	Rs2	Rd	Funkcija				
6		5	5	5	11				

### Nabor ukazov procesorja HIP

Mnemo-nik	Ime ukaza	Splošna oblika	Opis	Primer ukaza	Strojna koda primera	#up
add	add (signed)	add Rd, Rs1, Rs2	Rd <- Rs1 + Rs2	add r1, r2, r3	C0430800	4
addi	add immediate	addi Rd, Rs1, #n	Rd <- Rs1 + n, sign ext.	addi r1, r2, #0x1234	00411234	4
addu	add unsigned	addu Rd, Rs1, Rs2	Rd <- Rs1 + Rs2, unsigned	addu r1, r2, r3	C8430800	4
addui	add unsigned immediate	addui Rd, Rs1, #n	Rd <- Rs1 + n, unsigned	addui r1, r2, #0x1234	08411234	4
and	logical and	and Rd, Rs1, Rs2	Rd <- Rs1 and Rs2	and r1, r2, r3	D0430800	4
andi	and immediate	andi Rd, Rs1, #n	Rd <- Rs1 and n	andi r1, r2, #0x1234	10411234	4
beq	branch if equal	beq Rd, LABEL	Rd == 0 => PC <- LABEL (relative)	beq r0, L1 (L1 na za 4 večjem naslovu)	9C000000	3
bne	branch if not equal	bne Rd, LABEL	Rd != 0 => PC <- LABEL (relative)	bne r0, L1 (L1 na za 4 večjem naslovu)	8C000000	3
call	call subroutine	call Rd, LABEL (Rs1)	Rd <- PC + 4, PC <- LABEL + Rs1	call r1, SR(r0) (SR na naslovu 0xD4)	B40100D4	5
di	disable interrupts	di	I <- 0	di	D0000001	3
ei	enable interrupts	ei	I <- 1	ei	CC000001	3
halt	halts execution	halt		halt	7C000000	3
j	jump	j LABEL (Rs1)	PC <- LABEL + Rs1	j L1 (r0) (L1 na naslovu 0x30)	B0000030	3
lb	load byte	lb Rd, OFFSET (Rs1)	Rd <- MEM[OFFSET+Rs1], sign extended	lb r1, 0(r2)	90410000	6
lbu	load byte unsigned	lbu Rd, OFFSET (Rs1)	Rd <- MEM[OFFSET+Rs1], unsigned	lbu r1, 0(r2)	80410000	6
lh	load halfword (16 bit)	lh Rd, OFFSET (Rs1)	Rd <- MEM[OFFSET+Rs1], sign extended	lh r1, 0(r2)	94410000	6

lhi	load high immediate	lhi Rd, #n	Rd(31..16) <- n, Rd(15..0) <- 0	lhi r1, #0x12340000	1C011234	4
lhu	load halfword unsigned (16 bit)	lhu Rd, OFFSET(Rs1)	Rd <- MEM[OFFSET+Rs1], unsigned	lhu r1, 0(r2)	84410000	6
lw	load word (32 bit)	lw Rd, OFFSET(Rs1)	Rd <- MEM[OFFSET+Rs1]	lw r1, 0(r2)	98410000	6
mover	move from EPC to register	mover Rd	Rd <- EPC	mover r1	D4000801	4
movre	move from register to EPC	movre Rs1	EPC <- Rs1	movre r0	D8000001	3
nop	no operation	nop		nop	00000000	4
not	not(1's complement)	not Rd, Rs1, Rs2	Rd <- not Rs1	not r1, r2, r3	F8430800	4
or	logical or	or Rd, Rs1, Rs2	Rd <- Rs1 or Rs2	or r1, r2, r3	D4430800	4
ori	logical or immediate	ori Rd, Rs1, #n	Rd <- Rs1 or n	ori r1, r2, #0x1234	14411234	4
rfe	return from exception	rfe	PC <- EPC	rfe	BC000000	3
sb	store byte	sb Rd, Rs1, Rs2	MEM[OFFSET+Rs1] <- Rd	sb 0(r2), r3	A0430000	4
seq	set if equal	seq Rd, Rs1, Rs2	Rd <- Rs1 == Rs2	seq r1, r2, r3	E0430800	4
seqi	set if equal immediate	seqi Rd, Rs1, #n	Rd <- Rs1 == n	seqi r1, r2, #0x1234	20411234	4
sgt	set if greater than	sgt Rd, Rs1, Rs2	Rd <- Rs1 > Rs2	sgt r1, r2, r3	EC430800	4
sgti	set if greater than immediate	sgti Rd, Rs1, #n	Rd <- Rs1 > n	sgti r1, r2, #0x1234	2C411234	4
sgtu	set if greater than unsigned	sgtu Rd, Rs1, Rs2	Rd <- Rs1 > Rs2unsigned	sgtu r1, r2, r3	F4430800	4
sgtui	set if greater than unsigned immediate	sgtui Rd, Rs1, #n	Rd <- Rs1 > n unsigned	sgtui r1, r2, #0x1234	34411234	4
sh	store halfword (16 bit)	sh Rd, Rs1, Rs2	MEM[OFFSET+Rs1] <- Rd	sh 0(r2), r3	A4430000	4
sll	shift left logical	sll Rd, Rs1, Rs2	Rd <- Rs1 << Rs2, b0 <- 0	sll r1, r2, r3	C0430801	4
slli	shift left logical immediate	slli Rd, Rs1, #n	Rd <- Rs1 << n, b0 <- 0	slli r1, r2, #0x1234	40411234	4
slt	set if less than	slt Rd, Rs1, Rs2	Rd <- Rs1 < Rs2	slt r1, r2, r3	E8430800	4
slti	set if less than immediate	slti Rd, Rs1, #n	Rd <- Rs1 < n	slti r1, r2, #0x1234	28411234	4
sltu	set if less than unsigned	sltu Rd, Rs1, Rs2	Rd <- Rs1 < Rs2unsigned	sltu r1, r2, r3	F0430800	4
sltui	set if less than unsigned immediate	sltui Rd, Rs1, #n	Rd <- Rs1 < n unsigned	sltui r1, r2, #0x1234	30411234	4
sne	set if not equal	sne Rd, Rs1, Rs2	Rd <- Rs1 != Rs2	sne r1, r2, r3	E4430800	4
snei	set if not equal immediate	snei Rd, Rs1, #n	Rd <- Rs1 != n	snei r1, r2, #0x1234	24411234	4
sra	shift right arithmetic	sra Rd, Rs1, Rs2	Rd <- Rs1 >> Rs2, b31 <- b31	sra r1, r2, r3	C8430801	4
srai	shift right arithmetic immediate	srai Rd, Rs1, #n	Rd <- Rs1 >> n, b31 <- b31	srai r1, r2, #0x1234	48411234	4
srl	shift right logical	srl Rd, Rs1, Rs2	Rd <- Rs1 >> Rs2, b31 <- 0	srl r1, r2, r3	C4430801	4
srli	shift right logical immediate	srli Rd, Rs1, #n	Rd <- Rs1 >> n, b31 <- 0	srli r1, r2, #0x1234	44411234	4
sub	subtract	sub Rd, Rs1, Rs2	Rd <- Rs1 - Rs2	sub r1, r2, r3	C4430800	4
subi	subtract immediate	subi Rd, Rs1, #n	Rd <- Rs1 - n, sign extended	subi r1, r2, #0x1234	04411234	4
subu	subtract unsigned	subu Rd, Rs1, Rs2	Rd <- Rs1 - Rs2	subu r1, r2, r3	CC430800	4
subui	subtract unsigned immediate	subui Rd, Rs1, #n	Rd <- Rs1 - n, unsigned	subui r1, r2, #0x1234	0C411234	4
sw	store word (32 bit)	sw Rd, Rs1, Rs2	MEM[OFFSET+Rs1] <- Rd	sw 0(r2), r3	A8430000	4
trap	software interrupt	trap #n	EPC <- PC, PC <- M[FFFFFF00+4*n]	trap #2	B8000002	6
xor	exclusive or	xor Rd, Rs1, Rs2	Rd <- Rs1 xor Rs2	xor r1, r2, r3	D8430800	4
xori	exclusive or immediate	xori Rd, Rs1, #n	Rd <- Rs1 xor n	xori r1, r2, #0x1234	18411234	4