```
        .file    1 ""
        .section .mdebug.abi32
        .previous
        .nan     legacy
        .module fp=32
        .module nooddspreg
        .abicalls
        .text
        .align   2
        .globl   swap
        .set     nomips16
        .set     nomicromips
        .ent     swap
        .type    swap, @function
swap:
        .frame   $sp,0,$31          # vars= 0, regs= 0/0, args= 0, gp= 0
        .mask    0x00000000,0
        .fmask   0x00000000,0
        .set     noreorder
        .set     nomacro
        lw   $2,0($4)
        lw   $3,0($5)
        nop
        sw   $3,0($4)
        j    $31
        movz     $31,$31,$0
        sw   $2,0($5)

        .set     macro
        .set     reorder
        .end     swap
        .size    swap, .-swap
        .align   2
        .globl   partition
        .set     nomips16
        .set     nomicromips
        .ent     partition
        .type    partition, @function
partition:
        .frame   $sp,0,$31          # vars= 0, regs= 0/0, args= 0, gp= 0
        .mask    0x00000000,0
        .fmask   0x00000000,0
        .set     noreorder
        .set     nomacro
        sll $7,$6,2
        addu     $7,$4,$7
        slt $6,$5,$6
        lw   $8,0($7)
        beq $6,$0,$L3
        movz     $31,$31,$0
        addiu    $2,$5,-1

        sll $5,$5,2
        addu     $5,$4,$5
$L5:
        lw   $6,0($5)
        nop
        slt $3,$8,$6
        bne $3,$0,$L4
        nop
```

```
addiu   $2,$2,1
sll $3,$2,2
addu    $3,$4,$3
lw  $9,0($3)
sw  $6,0($3)
sw  $9,0($5)
$L4:
addiu   $5,$5,4
bne $7,$5,$L5
nop

lw  $8,0($7)
$L3:
addiu   $2,$2,1
sll $3,$2,2
addu    $4,$4,$3
lw  $3,0($4)
sw  $8,0($4)
j   $31
sw  $3,0($7)

.set    macro
.set    reorder
.end    partition
.size   partition, .-partition
.align  2
.globl  qsort
.set    nomips16
.set    nomicromips
.ent    qsort
.type   qsort, @function
qsort:
.frame  $sp,112,$31     # vars= 48, regs= 10/0, args= 16, gp= 8
.mask   0xc0ff0000,-4
.fmask  0x00000000,0
.set    noreorder
.cpload $25
.set    nomacro
addiu   $sp,$sp,-112
slt $2,$5,$6
.cprestore  16
sw  $31,108($sp)
sw  $fp,104($sp)
movz    $31,$31,$0
sw  $23,100($sp)
sw  $22,96($sp)
sw  $21,92($sp)
sw  $20,88($sp)
sw  $19,84($sp)
sw  $18,80($sp)
sw  $17,76($sp)
sw  $16,72($sp)
beq $2,$0,$L9
sw  $6,120($sp)

sll $2,$6,2
addu    $2,$4,$2
lw  $fp,%got(qsort)($28)
sw  $2,44($sp)
```

```
        move      $20,$4
$L14:
lw   $3,44($sp)
addiu    $7,$5,-1
sll $2,$5,2
lw   $9,0($3)
        move      $8,$7
        addu      $3,$20,$2
        move      $6,$5
$L12:
lw   $10,0($3)
lw   $11,120($sp)
addiu    $6,$6,1
slt $4,$9,$10
bne $4,$0,$L11
slt $11,$6,$11

addiu    $8,$8,1
sll $4,$8,2
        addu      $4,$20,$4
lw   $12,0($4)
sw   $10,0($4)
sw   $12,0($3)
$L11:
bne $11,$0,$L12
addiu    $3,$3,4

addiu    $3,$8,1
lw   $10,44($sp)
sll $3,$3,2
        addu      $6,$20,$3
        move      $4,$8
lw   $9,0($10)
sw   $8,24($sp)
lw   $8,0($6)
slt $4,$5,$4
sw   $9,0($6)
beq $4,$0,$L20
sw   $8,0($10)

addiu    $3,$3,-4
        addu      $3,$20,$3
sw   $3,48($sp)
        move      $19,$20
$L19:
lw   $9,0($3)
        move      $8,$7
        addu      $3,$19,$2
        move      $6,$5
$L17:
lw   $10,0($3)
lw   $11,24($sp)
addiu    $6,$6,1
slt $4,$9,$10
bne $4,$0,$L16
slt $11,$6,$11

addiu    $8,$8,1
sll $4,$8,2
        addu      $4,$19,$4
```

```
lw   $12,0($4)
sw   $10,0($4)
sw   $12,0($3)
$L16:
bne $11,$0,$L17
addiu    $3,$3,4

addiu    $3,$8,1
lw   $10,48($sp)
sll $3,$3,2
addu     $6,$19,$3
move     $4,$8
lw   $9,0($10)
sw   $8,28($sp)
lw   $8,0($6)
slt $4,$5,$4
sw   $9,0($6)
beq $4,$0,$L25
sw   $8,0($10)

addiu    $3,$3,-4
addu     $3,$19,$3
sw   $3,52($sp)
move     $20,$19
$L24:
lw   $9,0($3)
move     $8,$7
addu     $3,$20,$2
move     $6,$5
$L22:
lw   $10,0($3)
lw   $11,28($sp)
addiu    $6,$6,1
slt $4,$9,$10
bne $4,$0,$L21
slt $11,$6,$11

addiu    $8,$8,1
sll $4,$8,2
addu     $4,$20,$4
lw   $12,0($4)
sw   $10,0($4)
sw   $12,0($3)
$L21:
bne $11,$0,$L22
addiu    $3,$3,4

addiu    $3,$8,1
lw   $10,52($sp)
sll $3,$3,2
addu     $6,$20,$3
move     $4,$8
lw   $9,0($10)
sw   $8,32($sp)
lw   $8,0($6)
slt $4,$5,$4
sw   $9,0($6)
beq $4,$0,$L30
sw   $8,0($10)
```

```
addiu    $3,$3,-4
addu     $3,$20,$3
sw  $3,56($sp)
move     $19,$20
$L29:
lw  $9,0($3)
move     $23,$7
addu     $3,$19,$2
move     $6,$5
$L27:
lw  $8,0($3)
lw  $10,32($sp)
addiu    $6,$6,1
slt $4,$9,$8
bne $4,$0,$L26
slt $10,$6,$10

addiu    $23,$23,1
sll $4,$23,2
addu     $4,$19,$4
lw  $11,0($4)
sw  $8,0($4)
sw  $11,0($3)
$L26:
bne $10,$0,$L27
addiu    $3,$3,4

addiu    $3,$23,1
lw  $10,56($sp)
sll $3,$3,2
addu     $6,$19,$3
lw  $8,0($6)
lw  $9,0($10)
slt $4,$5,$23
sw  $9,0($6)
beq $4,$0,$L35
sw  $8,0($10)

addiu    $3,$3,-4
addu     $3,$19,$3
sw  $3,60($sp)
sw  $23,36($sp)
$L34:
lw  $9,0($3)
move     $22,$7
addu     $3,$19,$2
move     $6,$5
$L32:
lw  $8,0($3)
lw  $10,36($sp)
addiu    $6,$6,1
slt $4,$9,$8
bne $4,$0,$L31
slt $10,$6,$10

addiu    $22,$22,1
sll $4,$22,2
addu     $4,$19,$4
lw  $11,0($4)
sw  $8,0($4)
```

```
        sw   $11,0($3)
$L31:
        bne $10,$0,$L32
        addiu   $3,$3,4

        addiu   $3,$22,1
        lw   $10,60($sp)
        sll $3,$3,2
        addu    $6,$19,$3
        lw   $8,0($6)
        lw   $9,0($10)
        slt $4,$5,$22
        sw   $9,0($6)
        beq $4,$0,$L40
        sw   $8,0($10)

        addiu   $3,$3,-4
        addu    $3,$19,$3
        sw   $3,64($sp)
        sw   $22,40($sp)
        move    $21,$19
        move    $23,$7
$L39:
        lw   $8,0($3)
        move    $18,$23
        addu    $3,$21,$2
        move    $6,$5
$L37:
        lw   $7,0($3)
        lw   $9,40($sp)
        addiu   $6,$6,1
        slt $4,$8,$7
        bne $4,$0,$L36
        slt $9,$6,$9

        addiu   $18,$18,1
        sll $4,$18,2
        addu    $4,$21,$4
        lw   $10,0($4)
        sw   $7,0($4)
        sw   $10,0($3)
$L36:
        bne $9,$0,$L37
        addiu   $3,$3,4

        addiu   $3,$18,1
        lw   $9,64($sp)
        sll $3,$3,2
        addu    $6,$21,$3
        lw   $7,0($6)
        lw   $8,0($9)
        slt $4,$5,$18
        sw   $8,0($6)
        beq $4,$0,$L45
        sw   $7,0($9)

        addiu   $3,$3,-4
        addu    $20,$21,$3
        move    $19,$23
$L44:
```

```
lw   $9,0($20)
move     $16,$19
addu     $3,$21,$2
move     $4,$5
$L42:
lw   $7,0($3)
addiu    $4,$4,1
slt $6,$9,$7
bne $6,$0,$L41
slt $8,$4,$18

addiu    $16,$16,1
sll $6,$16,2
addu     $6,$21,$6
lw   $10,0($6)
sw   $7,0($6)
sw   $10,0($3)
$L41:
bne $8,$0,$L42
addiu    $3,$3,4

addiu    $3,$16,1
sll $3,$3,2
addu     $6,$21,$3
lw   $7,0($6)
lw   $8,0($20)
slt $4,$5,$16
sw   $8,0($6)
beq $4,$0,$L50
sw   $7,0($20)

addiu    $3,$3,-4
addu     $17,$21,$3
$L49:
lw   $9,0($17)
move     $22,$19
addu     $3,$21,$2
move     $4,$5
$L47:
lw   $7,0($3)
addiu    $4,$4,1
slt $6,$9,$7
bne $6,$0,$L46
slt $8,$4,$16

addiu    $22,$22,1
sll $6,$22,2
addu     $6,$21,$6
lw   $10,0($6)
sw   $7,0($6)
sw   $10,0($3)
$L46:
bne $8,$0,$L47
addiu    $3,$3,4

addiu    $3,$22,1
sll $3,$3,2
addu     $6,$21,$3
lw   $7,0($6)
lw   $8,0($17)
```

```
slt $4,$5,$22
sw  $8,0($6)
beq $4,$0,$L54
sw  $7,0($17)

addiu   $3,$3,-4
addu    $23,$21,$3
$L53:
lw  $8,0($23)
addu    $2,$21,$2
move    $3,$5
$L52:
lw  $6,0($2)
addiu   $3,$3,1
slt $4,$8,$6
bne $4,$0,$L51
slt $7,$3,$22

addiu   $19,$19,1
sll $4,$19,2
addu    $4,$21,$4
lw  $9,0($4)
sw  $6,0($4)
sw  $9,0($2)
$L51:
bne $7,$0,$L52
addiu   $2,$2,4

addiu   $2,$19,1
sll $2,$2,2
addu    $2,$21,$2
lw  $3,0($2)
lw  $4,0($23)
move    $6,$19
sw  $4,0($2)
move    $25,$fp
sw  $3,0($23)
.reloc  1f,R_MIPS_JALR,qsort
1:  jalr    $25
move    $4,$21

addiu   $5,$19,2
slt $2,$5,$22
beq $2,$0,$L54
addiu   $19,$19,1

b   $L53
sll $2,$5,2

$L73:
move    $20,$19
$L20:
lw  $2,24($sp)
nop
addiu   $5,$2,2
lw  $2,120($sp)
nop
slt $2,$5,$2
bne $2,$0,$L14
nop
```

```
$L9:
lw   $31,108($sp)
lw   $fp,104($sp)
lw   $23,100($sp)
lw   $22,96($sp)
lw   $21,92($sp)
lw   $20,88($sp)
lw   $19,84($sp)
lw   $18,80($sp)
lw   $17,76($sp)
lw   $16,72($sp)
j    $31
addiu    $sp,$sp,112

$L74:
move     $19,$20
$L25:
lw   $3,28($sp)
lw   $2,24($sp)
addiu    $5,$3,2
slt $2,$5,$2
beq $2,$0,$L73
addiu    $7,$3,1

lw   $3,48($sp)
b    $L19
sll $2,$5,2

$L75:
move     $20,$19
$L30:
lw   $3,32($sp)
lw   $2,28($sp)
addiu    $5,$3,2
slt $2,$5,$2
beq $2,$0,$L74
addiu    $7,$3,1

lw   $3,52($sp)
b    $L24
sll $2,$5,2

$L76:
lw   $23,36($sp)
$L35:
lw   $2,32($sp)
addiu    $5,$23,2
slt $2,$5,$2
beq $2,$0,$L75
addiu    $7,$23,1

lw   $3,56($sp)
b    $L29
sll $2,$5,2

$L54:
addiu    $5,$22,2
slt $2,$5,$16
beq $2,$0,$L50
```

```
        addiu   $19,$22,1

        b   $L49
        sll $2,$5,2

$L50:
        addiu   $5,$16,2
        slt $2,$5,$18
        beq $2,$0,$L45
        addiu   $19,$16,1

        b   $L44
        sll $2,$5,2

$L45:
        lw  $2,40($sp)
        addiu   $5,$18,2
        slt $2,$5,$2
        beq $2,$0,$L77
        addiu   $23,$18,1

        lw  $3,64($sp)
        b   $L39
        sll $2,$5,2

$L77:
        lw  $22,40($sp)
        move    $19,$21
$L40:
        lw  $2,36($sp)
        addiu   $5,$22,2
        slt $2,$5,$2
        beq $2,$0,$L76
        addiu   $7,$22,1

        lw  $3,60($sp)
        b   $L34
        sll $2,$5,2

        .set    macro
        .set    reorder
        .end    qsort
        .size   qsort, .-qsort
        .section    .rodata.str1.4,"aMS",@progbits,1
        .align  2
$LC1:
        .ascii  "%d\012\000"
        .rdata
        .align  2
$LC0:
        .word   9
        .word   8
        .word   7
        .word   6
        .word   5
        .word   4
        .word   3
        .word   2
        .word   1
        .word   0
```

```
        .section        .text.startup,"ax",@progbits
        .align  2
        .globl  main
        .set    nomips16
        .set    nomicromips
        .ent    main
        .type   main, @function
main:
        .frame  $sp,80,$31      # vars= 40, regs= 4/0, args= 16, gp= 8
        .mask   0x80070000,-4
        .fmask  0x00000000,0
        .set    noreorder
        .cpload $25
        .set    nomacro
        lw  $2,%got($LC0)($28)
        addiu   $sp,$sp,-80
        addiu   $2,$2,%lo($LC0)
        sw  $16,64($sp)
        addiu   $16,$sp,24
        movz    $31,$31,$0
        .cprestore  16
        sw  $31,76($sp)
        sw  $18,72($sp)
        sw  $17,68($sp)
        move    $3,$16
        addiu   $4,$2,32
$L83:
        lw  $8,0($2)
        lw  $7,4($2)
        lw  $6,8($2)
        lw  $5,12($2)
        addiu   $2,$2,16
        sw  $8,0($3)
        sw  $7,4($3)
        sw  $6,8($3)
        sw  $5,12($3)
        bne $2,$4,$L83
        addiu   $3,$3,16

        lw  $7,0($2)
        lw  $2,4($2)
        lw  $25,%got(qsort)($28)
        li  $6,9            # 0x9
        move    $5,$0
        move    $4,$16
        sw  $7,0($3)
        .reloc  1f,R_MIPS_JALR,qsort
1:  jalr    $25
        sw  $2,4($3)

        lw  $28,16($sp)
        addiu   $18,$sp,64
        lw  $17,%got($LC1)($28)
        nop
        addiu   $17,$17,%lo($LC1)
$L84:
        lw  $25,%call16(__printf_chk)($28)
        lw  $6,0($16)
        move    $5,$17
        li  $4,1            # 0x1
```

```
.reloc   1f,R_MIPS_JALR,__printf_chk
1:  jalr    $25
addiu    $16,$16,4

lw  $28,16($sp)
bne $16,$18,$L84
move     $2,$0

lw  $31,76($sp)
lw  $18,72($sp)
lw  $17,68($sp)
lw  $16,64($sp)
j   $31
addiu    $sp,$sp,80

.set     macro
.set     reorder
.end     main
.size    main, .-main
.ident   "GCC: (Ubuntu 5.4.0-6ubuntu1~16.04.1) 5.4.0 20160609"
```