```
 # Demo for painting
 #
# Bitmap Display Configuration:
 # - Unit width in pixels: 8
 # - Unit height in pixels: 8
 # - Display width in pixels: 256
# - Display height in pixels: 256
 # - Base Address for Display: 0x10008000 ($gp)
 #
.data
displayAddress: .word 0x10008000
blackAddress: .word 0x000000
size: .word 32
x_coor_frog_unit_width: 64
y_coor_frog_unit_width: 50
#below values are in pixels (unit * 16)
x_coor_r1_v1: 0
y_coor_r1_v1: 576

#below values are in pixels (unit * 16)
x_coor_r1_v2: 32
y_coor_r1_v2: 576
#below values are in pixels (unit * 16)
x_coor_r2_v1: 8
y_coor_r2_v1: 708

#below values are in pixels (unit * 16)
x_coor_r2_v2: 40
y_coor_r2_v2: 708


x_coor_r1_l1: 0
y_coor_r1_l1: 128

#below values are in pixels (unit * 16)
x_coor_r1_l2: 32
y_coor_r1_l2: 128

#below values are in pixels (unit * 16)
x_coor_r2_l1: 4
 y_coor_r2_l1: 260

#below values are in pixels (unit * 16)
x_coor_r2_l2: 32
y_coor_r2_l2: 260

##vehicle row 1 space
vehiclerow1: .space 128

vehiclerow2: .space 128

.text
#Central Loop
```

```
STARTGAME:


li $v1, 0

CHECKIN:

lw $t8, 0xffff0000
beq $t8, 1, keyboardinput

bge $t1, 3, ABORMAL
NORMAL:

li $t0,0
lw $t0, displayAddress # $t0 stores the base address for display
#li $t1, 0xff0000 # $t1 stores the red colour code
li $t2, 0x00ff00 # $t2 stores the green colour code
li $t3, 0x0000ff # $t3 stores the blue colour code

j GREENTOP

ABORMAL:
li $t0,0
lw $t0, displayAddress # $t0 stores the base address for display
#li $t1, 0xff0000 # $t1 stores the red colour code
li $t2, 0x800080# $t2 stores the purple colour code
li $t3, 0xFFFFFF # $t3 stores the white colour code




GREENTOP:
li $t3, 0x0000ff
beq $t4, 32, END
sw $t2, 64($t0)
addi $t0, $t0, 4
addi $t4, $t4, 1
j GREENTOP


END: li $t4, 0

li $t3, 0xff0000
GREENGOAL:
sw $t3, -56($t0)
sw $t3, -40($t0)
sw $t3, -24($t0)
li $t3, 0x0000ff

li $t4, 0

BLUETOP:
beq $t4, 64, ENDB
sw $t3, 0($t0)
addi $t0, $t0, 4
```

```
addi $t4, $t4, 1
j BLUETOP

ENDB: li $t4, 0

li $t3, 0xFFFF00

YELLOWTOP:
beq $t4, 48, ENDY

sw $t3, 0($t0)
addi $t0, $t0, 4
addi $t4, $t4, 1
j YELLOWTOP

ENDY: li $t4, 0

li $t3, 0x0000ff

li $s4, 0x808080

GREYTOP1:
beq $t4, 32, ENDGR
sw $s4, 0($t0)
addi $t0, $t0, 4
addi $t4, $t4, 1
j GREYTOP1

ENDGR: li $t4, 0

GREYTOP2:
beq $t4, 32, ENDGR2
sw $s4, 0($t0)
addi $t0, $t0, 4
addi $t4, $t4, 1
j GREYTOP2

ENDGR2: li $t4, 0

GREENBOT:
beq $t4, 48, ENDBOT
sw $t2, 0($t0)
addi $t0, $t0, 4
addi $t4, $t4, 1
j GREENBOT

ENDBOT: li $t4, 0


li $t3, 0xff0000
lw $t0, displayAddress


ZERO:
beq $t1, 0, COMP0
```

```
j ONECOMP
COMP0:
sw $t3, 884($t0)
sw $t3, 948($t0)
sw $t3, 1012($t0)
sw $t3, 1016($t0)
sw $t3, 888($t0)
sw $t3, 892($t0)
sw $t3, 956($t0)
sw $t3, 1020($t0)

ONECOMP:
beq $t1, 1, COMP1
j TWOCOMP
COMP1:
sw $t3, 892($t0)
sw $t3, 956($t0)
sw $t3, 1020($t0)

TWOCOMP:
beq $t1, 2, COMP2
j THREECOMP
COMP2:
sw $t3, 884($t0)
sw $t3, 888($t0)
sw $t3, 952($t0)
sw $t3, 1016($t0)
sw $t3, 1020($t0)

THREECOMP:
beq $t1, 3, COMP3
j FOURCOMP
COMP3:
sw $t3, 884($t0)
sw $t3, 888($t0)
sw $t3, 952($t0)
sw $t3, 1016($t0)
sw $t3, 1012($t0)

FOURCOMP:
beq $t1, 4, COMP4
j FIVECOMP
COMP4:
sw $t3, 892($t0)
sw $t3, 956($t0)
sw $t3, 952($t0)
sw $t3, 948($t0)
sw $t3, 884($t0)
sw $t3, 1020($t0)

FIVECOMP:
beq $t1, 5, COMP5
j SIXCOMP
COMP5:
sw $t3, 892($t0)
```

```
sw $t3, 888($t0)
sw $t3, 952($t0)
sw $t3, 1016($t0)
sw $t3, 1012($t0)

SIXCOMP:
beq $t1, 6, COMP6
j CLOSE
COMP6:
sw $t3, 888($t0)
sw $t3, 956($t0)
sw $t3, 952($t0)
sw $t3, 1016($t0)
sw $t3, 1020($t0)
j TERMINATE




CLOSE:
li $t3, 0xff0000
lw $t0, displayAddress




keyboardinput:
#sw $t8, 0xffff0004
lw $a2, 0xffff0004
sw $t8, 0xffff0004

s:
bne $a2, 0x73, d
add $s0, $s0, 64
li $a2, 0 #clear the key register

j FROGDRAW

d:
bne $a2, 0x64, a
add $s2, $s2, 8
li $a2, 0 #clear the key register
j FROGDRAW

a:
bne $a2, 0x61, W
add $s1, $s1, -8
li $a2, 0 #clear the key register
j FROGDRAW

W:
bne $a2, 0x77, FROGDRAW
add $a3, $a3, -64
#add $t0, $t0, $a3
```

```
li $a2, 0 #clear the key register
j FROGDRAW


FROGDRAW:
li $t8, 0
lw $t0, displayAddress

li $t4, 0xFFC0CB

li $t5, 16

lw $t6, x_coor_frog_unit_width
lw $t7, y_coor_frog_unit_width

mul $t7, $t7, $t5

add $t0, $t0, $t6

add $t0, $t0, $t7

add $t0, $t0, $a3 #add whatever offset the frog moved up by
add $t0, $t0, $s0 #add whatever offset the frog moved down by
add $t0, $t0, $s1 #add whatever offset the frog moved left by
add $t0, $t0, $s2 #add whatever offset the frog moved right by

sw $t4, 64($t0)

la $s4, 64($t0)
la $t2, 64($t0)
lw $t0, displayAddress

j VEHICLE1

FROGDRAWLOG:
 #li $t8, 0
lw $t0, displayAddress

li $t4, 0xFFC0CB

li $t5, 16

lw $t6, x_coor_frog_unit_width
lw $t7, y_coor_frog_unit_width

#multiply y*16
mul $t7, $t7, $t5

add $t0, $t0, $t6

add $t0, $t0, $t7

add $t0, $t0, $a3 #add whatever offset the frog moved up by
add $t0, $t0, $s0 #add whatever offset the frog moved down by
add $t0, $t0, $s1 #add whatever offset the frog moved left by
```

```
add $t0, $t0, $s2 #add whatever offset the frog moved right by

sw $t4, 64($t0)

la $s4, 64($t0)
la $t2, 64($t0)
lw $t0,displayAddress
j VEHICLE1

VEHICLE1:
li $t4, 0
lw $t0, displayAddress
lw $s6, displayAddress

SHIFTER1:
bne $s5, 0xff0000, ELSE1
li $s3, 0
add $t0, $t0, $s3

j NEXT1

ELSE1:

add $t0, $t0, $s3

NEXT1:

lw $t6, x_coor_r1_v1
lw $t7, y_coor_r1_v1

add $t0, $t0, $t6
add $t0, $t0, $t7

ONE:
la $t6, 0
la $t6, 76($t0)
beq $s4, $t6, RESETONE
j TWO
RESETONE:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress #remove if needed
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0
#sw $s2,
```

```
bgtz $v1, SOUND2
j ESCAPE2
SOUND2:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE2:
j FROGDRAW

 TWO:
la $t6, 72($t0)
beq $s4, $t6, RESETTWO
j THREE
RESETTWO:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0


bgtz $v1, SOUND1
j ESCAPE
SOUND1:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE:
j FROGDRAW

 THREE:
la $t6, 68($t0)
beq $s4, $t6, RESETTHREE
j FOUR
RESETTHREE:
lw $t8, 0xffff0004
```

```
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0


bgtz $v1, SOUND3
j ESCAPE3
SOUND3:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE3:
j FROGDRAW

FOUR:
la $t6, 64($t0)
beq $s4, $t6, RESETFOUR
j FIVE
RESETFOUR:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0

bgtz $v1, SOUND4
j ESCAPE4
SOUND4:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
```

```
li $a3, 50
syscall
li $a3, 0
ESCAPE4:
j FROGDRAW

FIVE:
la $t6, 0($t0)
beq $s4, $t6, RESETFIVE
j SIX

RESETFIVE:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0


bgtz $v1, SOUND5
j ESCAPE5
SOUND5:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE5:
j FROGDRAW

SIX:
la $t6, 4($t0)
beq $s4, $t6, RESETSIX
j SEVEN
RESETSIX:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
```

```
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0



bgtz $v1, SOUND6
j ESCAPE6
SOUND6:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE6:
j FROGDRAW

SEVEN:
la $t6, 8($t0)
beq $s4, $t6, RESETSEVEN
j EIGHT
RESETSEVEN:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0


bgtz $v1, SOUND7
j ESCAPE7
SOUND7:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE7:
j FROGDRAW
```

```
EIGHT:
la $t6, 12($t0)
 beq $s4, $t6, RESETEIGHT
j PAINT
RESETEIGHT:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0


bgtz $v1, SOUND8
j ESCAPE8
SOUND8:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE8:
j FROGDRAW

PAINT:
sw $t3, 0($t0)
sw $t3, 4($t0)
sw $t3, 8($t0)
sw $t3, 12($t0)
sw $t3, 64($t0)
sw $t3, 68($t0)
sw $t3, 72($t0)
sw $t3, 76($t0)

VEHICLE2:
 #create vehicle 2:
li $t0, 0
li $t4, 0
lw $t0, displayAddress
li $t6, 0
lw $s6, displayAddress

SHIFTER2:
bne $s5, 0xff0000, ELSE
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```
li $s3, 0
add $t0, $t0, $s3
j NEXT

ELSE:

add $t0, $t0, $s3


NEXT:
#load x and y val into diff registers
lw $t6, x_coor_r1_v2
lw $t7, y_coor_r1_v2

#add x to pixel val
add $t0, $t0, $t6

#add y to pixel val
add $t0, $t0, $t7

ONE2:
la $t6, 0
la $t6, 76($t0)
beq $s4, $t6, RESETONE2
j TWO2
RESETONE2:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0


bgtz $v1, SOUND9
j ESCAPE9
SOUND9:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE9:
j FROGDRAW
```

```
TWO2:
la $t6, 72($t0)
beq $s4, $t6, RESETTWO2
j THREE2
RESETTWO2:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0

bgtz $v1, SOUND10
j ESCAPE10
SOUND10:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE10:
j FROGDRAW

THREE2:
la $t6, 68($t0)
beq $s4, $t6, RESETTHREE2
j FOUR2
RESETTHREE2:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0


bgtz $v1, SOUND11
```

```
j ESCAPE11
SOUND11:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE11:
j FROGDRAW

FOUR2:
la $t6, 64($t0)
beq $s4, $t6, RESETFOUR2
j FIVE2
RESETFOUR2:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0


bgtz $v1, SOUND12
j ESCAPE12
SOUND12:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE12:
j FROGDRAW

FIVE2:
la $t6, 0($t0)
 beq $s4, $t6, RESETFIVE2
j SIX2
RESETFIVE2:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
```

```
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0


bgtz $v1, SOUND13
j ESCAPE13
SOUND13:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE13:
j FROGDRAW

SIX2:
la $t6, 4($t0)
beq $s4, $t6, RESETSIX2
j SEVEN2
 RESETSIX2:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0


bgtz $v1, SOUND14
j ESCAPE14
SOUND14:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
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```
li $a3, 0
ESCAPE14:
j FROGDRAW

SEVEN2:
la $t6, 8($t0)
beq $s4, $t6, RESETSEVEN2
j EIGHT2
RESETSEVEN2:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
sw $s2, 480($t0)
li $s2, 0


bgtz $v1, SOUND15
j ESCAPE15
SOUND15:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE15:
j FROGDRAW

EIGHT2:
la $t6, 12($t0)
beq $s4, $t6, RESETEIGHT2
j PAINTCAR
RESETEIGHT2:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 472($t0)
sw $s2, 476($t0)
```

```
sw $s2, 480($t0)
li $s2, 0


bgtz $v1, SOUND16
j ESCAPE16
SOUND16:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE16:
j FROGDRAW

PAINTCAR:
 #paint top and bottom row of car

sw $t3, 0($t0)
sw $t3, 4($t0)
sw $t3, 8($t0)
sw $t3, 12($t0)
sw $t3, 64($t0)
sw $t3, 68($t0)
sw $t3, 72($t0)
sw $t3, 76($t0)

#create vehicle 3:
li $t0, 0
lw $t0, displayAddress

SHIFTER3:
bne $s7, 0xff0000, ELSE3

li $s3, 0
sub $t0, $t0, $s3
j NEXT3

ELSE3:

sub $t0, $t0, $s3

NEXT3:
#load x and y val into diff registers
lw $t6, x_coor_r2_v1
lw $t7, y_coor_r2_v1

#add x to pixel val
add $t0, $t0, $t6

#add y to pixel val
add $t0, $t0, $t7
```

```
BOTTOMRIGHT:

la $t6, 76($t0)
beq $s4, $t6, RESET
j BOTTOMMIDDLE2
RESET:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
add $v1, $v1, 1

bgtz $v1, SOUND17
j ESCAPE17
SOUND17:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE17:
j FROGDRAW

BOTTOMMIDDLE2:
la $t6, 72($t0)
beq $s4, $t6, RESET2
j BOTTOMMIDDLE1
RESET2:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0


bgtz $v1, SOUND18
j ESCAPE18
SOUND18:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
```

```
syscall
li $a3, 0
ESCAPE18:
j FROGDRAW

BOTTOMMIDDLE1:
la $t6, 68($t0)
beq $s4, $t6, RESET3
j BOTTOMLEFT
RESET3:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0




bgtz $v1, SOUND19
j ESCAPE19
SOUND19:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE19:
j FROGDRAW

BOTTOMLEFT:
la $t6, 64($t0)
beq $s4, $t6, RESET4
j TOPLEFT
RESET4:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
```

```
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0




bgtz $v1, SOUND20
j ESCAPE20
SOUND20:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE20:
j FROGDRAW

TOPLEFT:
la $t6, 0($t0)
beq $s4, $t6, RESET5
j TOPMIDDLE1

RESET5:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0




bgtz $v1, SOUND21
j ESCAPE21
SOUND21:
li $v0, 31
```

```
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE21:
j FROGDRAW


TOPMIDDLE1:
la $t6, 4($t0)
beq $s4, $t6, RESET6
j TOPMIDDLE2
RESET6:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0




bgtz $v1, SOUND22
j ESCAPE22
SOUND22:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE22:
j FROGDRAW


TOPMIDDLE2:
la $t6, 8($t0)
beq $s4, $t6, RESET7
j TOPRIGHT

RESET7:
```

```
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0




bgtz $v1, SOUND23
j ESCAPE23
SOUND23:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE23:
j FROGDRAW

TOPRIGHT:
la $t6, 12($t0)
beq $s4, $t6, RESET8
j PAINTV
RESET8:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0
```

```
bgtz $v1, SOUND24
j ESCAPE24
SOUND24:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE24:
j FROGDRAW

PAINTV:

sw $t3, 0($t0)
sw $t3, 4($t0)
sw $t3, 8($t0)
sw $t3, 12($t0)
sw $t3, 64($t0)
sw $t3, 68($t0)
sw $t3, 72($t0)
sw $t3, 76($t0)


   #create vehicle 4:
li $t0, 0
lw $t0, displayAddress



SHIFTER4:
bne $s7, 0xff0000, ELSE4

li $s3, 0
sub $t0, $t0, $s3
j NEXT4


ELSE4:

sub $t0, $t0, $s3


NEXT4:

lw $t6, x_coor_r2_v2
lw $t7, y_coor_r2_v2

#add x to pixel val
add $t0, $t0, $t6
```

```
add $t0, $t0, $t7

BOTTOMRIGHTB:
la $t6, 0
la $t6, 76($t0)
beq $s4, $t6, RESETB
j BOTTOMMIDDLE2B
RESETB:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0




bgtz $v1, SOUND25
j ESCAPE25
SOUND25:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE25:
j FROGDRAW

BOTTOMMIDDLE2B:
la $t6, 72($t0)
beq $s4, $t6, RESET2B
j BOTTOMMIDDLE1B
RESET2B:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
```

```
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0




bgtz $v1, SOUND26
j ESCAPE25
SOUND26:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE26:
j FROGDRAW



BOTTOMMIDDLE1B:
la $t6, 68($t0)
beq $s4, $t6, RESET3B
j BOTTOMLEFTB
RESET3B:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0


bgtz $v1, SOUND27
j ESCAPE27
SOUND27:
li $v0, 31
li $a0, 70
li $a1, 600
```

```
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE27:
j FROGDRAW

BOTTOMLEFTB:
la $t6, 64($t0)
beq $s4, $t6, RESET4B
j TOPLEFTB
RESET4B:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0



bgtz $v1, SOUND28
j ESCAPE28
SOUND28:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE28:
j FROGDRAW

 TOPLEFTB:
la $t6, 0($t0)
beq $s4, $t6, RESET5B
j TOPMIDDLE1B

RESET5B:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
```

```
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0



bgtz $v1, SOUND29
j ESCAPE29
SOUND29:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE29:
j FROGDRAW

TOPMIDDLE1B:
la $t6, 4($t0)
beq $s4, $t6, RESET6B
j TOPMIDDLE2B
RESET6B:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0


bgtz $v1, SOUND30
j ESCAPE30
SOUND30:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE30:
```

```
j FROGDRAW

TOPMIDDLE2B:
la $t6, 8($t0)
beq $s4, $t6, RESET7B
j TOPRIGHTB
 RESET7B:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0




bgtz $v1, SOUND31
j ESCAPE31
SOUND31:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE31:
j FROGDRAW

TOPRIGHTB:
la $t6, 12($t0)
beq $s4, $t6, RESET8B
j PAINT6
RESET8B:
lw $t8, 0xffff0004
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
```

```
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0




bgtz $v1, SOUND32
j ESCAPE32
SOUND32:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE32:
j FROGDRAW


PAINT6:

sw $t3, 0($t0)
sw $t3, 4($t0)
sw $t3, 8($t0)
sw $t3, 12($t0)
sw $t3, 64($t0)
sw $t3, 68($t0)
sw $t3, 72($t0)
sw $t3, 76($t0)

li $t4, 0
li $t3, 0x964B00

LOGCREATE:
li $t4, 0
li $t3, 0x964B00

####CREATE LOGS

li $t0, 0
lw $t0, displayAddress

LOGSHIFT1:
bne $t9, 0x964B00, ELSEL1
li $k0, 0
add $t0, $t0, $k0
j NEXTL1

ELSEL1:
```

```
add $t0, $t0, $k0

NEXTL1:

lw $t6, x_coor_r1_l1
lw $t7, y_coor_r1_l1

#add x to pixel val
add $t0, $t0, $t6

 #add y to pixel val
add $t0, $t0, $t7


#paint top and bottom row of log
sw $t3, 0($t0)
sw $t3, 4($t0)
sw $t3, 8($t0)
sw $t3, 12($t0)
sw $t3, 64($t0)
sw $t3, 68($t0)
sw $t3, 72($t0)
sw $t3, 76($t0)

#log2

li $t0, 0
lw $t0, displayAddress

LOGSHIFT2:
bne $t9, 0x964B00, ELSEL2

li $k0, 0
add $t0, $t0, $k0
j NEXTL2

ELSEL2:

add $t0, $t0, $k0

NEXTL2:
 #add $t0, $t0, $s3
 #load x and y val into diff registers
lw $t6, x_coor_r1_l2
lw $t7, y_coor_r1_l2

 #add x to pixel val
add $t0, $t0, $t6

 #add y to pixel val
add $t0, $t0, $t7

#paint top and bottom row of log
sw $t3, 0($t0)
```

```
sw $t3, 4($t0)
sw $t3, 8($t0)
sw $t3, 12($t0)
sw $t3, 64($t0)
sw $t3, 68($t0)
sw $t3, 72($t0)
sw $t3, 76($t0)


#log3
DRAWLOG3:

li $t0, 0
lw $t0, displayAddress

LOGSHIFT3:
bne $k1, 0x964B00, ELSEL3

li $k0, 0
sub $t0, $t0, $k0
j NEXTL3

ELSEL3:

 sub $t0, $t0, $k0

NEXTL3:

#load x and y val into diff registers
lw $t6, x_coor_r2_l1
lw $t7, y_coor_r2_l1

#add x to pixel val
add $t0, $t0, $t6

 #add y to pixel val
add $t0, $t0, $t7

PAINT3:

sw $t3, 0($t0)
sw $t3, 4($t0)
sw $t3, 8($t0)
sw $t3, 12($t0)
sw $t3, 64($t0)
sw $t3, 68($t0)
sw $t3, 72($t0)
sw $t3, 76($t0)

 LOG4DRAW:

li $t0, 0
lw $t0, displayAddress

LOGSHIFT4:
```

```
bne $k1, 0x964B00, ELSEL4

li $k0, 0
sub $t0, $t0, $k0

j NEXTL4

ELSEL4:

sub $t0, $t0, $k0

NEXTL4:

lw $t6, x_coor_r2_l2
lw $t7, y_coor_r2_l2

#add x to pixel val
add $t0, $t0, $t6

 #add y to pixel val
add $t0, $t0, $t7

#paint top and bottom row of log
sw $t3, 0($t0)
sw $t3, 4($t0)
sw $t3, 8($t0)
sw $t3, 12($t0)
sw $t3, 64($t0)
sw $t3, 68($t0)
sw $t3, 72($t0)
sw $t3, 76($t0)

lw $t0, displayAddress

####CHECK IF FROG IS NEAR/ON A LOG
li $t0, 0
lw $t0, displayAddress
li $t3, 0
li $t4, 0

FINDBLUELOG:
beq $t4, 64, FINDSTART
lw $t3, 128($t0) #load pixel address
beq $t3, 0x964B00, FROGAWAY
addi $t0, $t0, 4 #move to the next pixel address
addi $t4, $t4, 1 #move one pixel further in the blue space
j FINDBLUELOG

FROGAWAY:
li $t4, 0
la $t3, ($t3)
add $s4, $s4, -4
beq $t3, $s4, PASS
j SECONDCHECK
```

```
SECONDCHECK:
add $s4, $s4, 8
beq $t3, $s4, PASS
j FINDSTART

PASS:
j LOADED

FINDSTART:
 ####CHECK IF FROG IS IN THE WATER
li $t0, 0
lw $t0, displayAddress
li $t3, 0
li $t4, 0
#li $t4, 128
FINDBLUE:
beq $t4, 64, NEXTCHECK
la $t3, 128($t0)
addi $t0, $t0, 4
addi $t4, $t4, 1
add $s4, $s4, 4 #adjust this to find where the frog dies in the water
beq $t3, $s4, ERASEFROG
j FINDBLUE

li $t4, 0
lw $t0, displayAddress
NEXTCHECK:
#add $s4, $s4, -256
beq $t4, 64, ENDBLUE
la $t3, 128($t0)
addi $t0, $t0, 4
addi $t4, $t4, 1
add $s4, $s4, -3
beq $t3, $s4, ERASEFROG
j NEXTCHECK


ERASEFROG:
lw $t0, displayAddress
li $t8, 0
li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
lw $t0, displayAddress
add $v1, $v1, 1
lw $s2, blackAddress
sw $s2, 408($t0)
sw $s2, 416($t0)
sw $s2, 536($t0)
sw $s2, 540($t0)
sw $s2, 544($t0)
li $s2, 0
li $t4,0
bgtz $v1, SOUND33
```

```
j ESCAPE33
SOUND33:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 50
li $a3, 50
syscall
li $a3, 0
ESCAPE33:

j FROGDRAW

lw $t0, displayAddress

ENDBLUE:

#create a clause in frogdraw that allows us to restore the current frog address from 64(t0
) into $s4

li $t4,0
#li $t0, 0
lw $t0, displayAddress

FINDGOAL1:
la $t4, 72($t0)
beq $t2, $t4, ERASEFROGFIN
li $t4, 0
j FINDGOAL2

FINDGOAL2:

la $t4, 88($t0)
beq $t2, $t4, ERASEFROGFIN
li $t4, 0
j FINDGOAL3

FINDGOAL3:
la $t4, 104($t0)
beq $t2, $t4, ERASEFROGFIN
li $t4, 0
j CONTINUE


ERASEFROGFIN:
li $v0, 31
li $a0, 70
li $a1, 600
li $a2, 71
li $a3, 100
addi $t1, $t1, 1
syscall

blt $t1, 3, ERCONTINUE
li $v0, 31
```

```
li $a0, 66
li $a1, 1000
li $a2, 41
li $a3, 100
syscall

ERCONTINUE:
li $a3, 0
lw $t0, displayAddress
li $t8, 0
#li $a3, 0
li $s0, 0
li $s1, 0
li $s2, 0
li $s3, 0
li $t4, 0
#add $v1, $v1, 1
#bgtz $v1, SOUND34
#j ESCAPE34
#SOUND34:
ESCAPE34:
j FROGDRAW

LOADED:
lw $s6, displayAddress
lw $t0, displayAddress

CONTINUE:

lw $s5, 636($s6) #memory locations at ends
#lw $s7, 700($s6)
lw $s7, 704($s6)
lw $t9, 188($s6)
lw $k1, 256($s6)

li $v0, 32
li $a0, 1000
syscall

lw $t0, displayAddress
li $t4, 0
#li $t0,0
#li $t1, 0 # $t1 stores the red colour code
li $t2, 0 # $t2 stores the green colour code
li $t3, 0 #stores blue
#li $t5, 0 #stores blue
#li $t6, 0 #stores blue
li $t7, 0 #stores blue
#li $s1, 0
#li $s2, 0
#li $at, 0
li $a0, 0
li $v0, 0

SHIFTER:
```

```
add $s3, $s3, 4

SHIFTERLOG:
add $k0, $k0, 4

beq $v1, 0, PAINTSTRIKE0
j LIFE1
PAINTSTRIKE0:
li $t3, 0xFFA500
sw $t3, 0($t0)
sw $t3, 8($t0)
sw $t3, 16($t0)


LIFE1:
beq $v1, 1, PAINTSTRIKE
j LIFE2
PAINTSTRIKE:
li $t3, 0xFFA500
sw $t3, 0($t0)
sw $t3, 8($t0)
li $t3, 0x000000
sw $t3, 16($t0)


LIFE2:
beq $v1, 2, PAINTSTRIKE1
j LIFE3
PAINTSTRIKE1:
li $t3, 0xFFA500
sw $t3, 0($t0)
li $t3, 0x000000
sw $t3, 8($t0)
sw $t3, 16($t0)

LIFE3:
beq $v1, 3, PAINTSTRIKE2
j FINALEXIT
PAINTSTRIKE2:
li $t3, 0x000000
sw $t3, 0($t0)
j Exit

NEXTLEVEL:
beq $t1, 3, LEVELUP
j FINALEXIT


#FINALEXIT:
#beq $v1, 3, Exit
#nop
FINALEXIT:

j CHECKIN
```

```
Exit:
li $v0, 31
li $a0, 20
li $a1, 600
li $a2, 25
li $a3, 100
syscall
li $a3, 0
j TERMINATE
LEVELUP:
#level up sound
li $v0, 31
li $a0, 66
li $a1, 1000
li $a2, 106
li $a3, 100
syscall
li $a3, 0
#clear all registers except t1
li $v0, 0
li $v1, 0
li $a0, 0
li $a1, 0
li $a2, 0
li $a3, 0
li $t0, 0
li $t2, 0
li $t3, 0
li $t4, 0
li $t5, 0
li $t6, 0
li $t7, 0
li $t8, 0
li $t9, 0
li $s0, 0
li $s1, 0
li $s2, 0
li $s3, 0
li $s4, 0
li $s5, 0
li $s6, 0
li $s7, 0
li $k0, 0
li $k1, 0
j STARTGAME

TERMINATE:
li $v0, 10 # terminate the program gracefully
syscall
```