

Q1

QtSpim

File Simulator Registers Text Segment Data Segment Window Help

FP Regs Int Regs [10]

Data Text

Int Regs [10]

PC = 4194436
EPC = 0
Cause = 0
BadVAddr = 0
Status = 805371664
HI = 0
LO = 0
R0 [r0] = 0
R1 [at] = 268500992
R2 [v0] = 10
R3 [v1] = 0
R4 [a0] = 268501012
R5 [a1] = 2147481016
R6 [a2] = 2147481028
R7 [a3] = 0
R8 [t0] = 55
R9 [t1] = 89
R10 [t2] = 55
R11 [t3] = 0
R12 [t4] = 0
R13 [t5] = 0
R14 [t6] = 0
R15 [t7] = 0
R16 [s0] = 10
R17 [s1] = 10
R18 [s2] = 0
R19 [s3] = 0
R20 [s4] = 0
R21 [s5] = 0

Text

```
[00400010] 00c23021 addu $6, $6, $2 ; 187: addu $a2 $a2, $a2
[00400014] 0c100009 jal 0x00400024 [main] ; 188: jal main
[00400018] 00000000 nop ; 189: nop
[0040001c] 3402000a ori $2, $0, 10 ; 191: li $v0, 10
[00400020] 0000000c syscall ; 192: syscall # 5
[00400024] 34020004 ori $2, $0, 4 ; 8: li $v0, 4
[00400028] 3c041001 lui $4, 4097 [msg1] ; 9: la $a0, msg1
[0040002c] 0000000c syscall ; 10: syscall
[00400030] 34020005 ori $2, $0, 5 ; 12: li $v0, 5
[00400034] 0000000c syscall ; 13: syscall
[00400038] 00028021 addu $16, $0, $2 ; 15: move $s0, $v0
[0040003c] 34080000 ori $8, $0, 0 ; 17: li $t0, 0
[00400040] 34090001 ori $9, $0, 1 ; 18: li $t1, 1
[00400044] 34110000 ori $17, $0, 0 ; 19: li $s1, 0
[00400048] 0230902a slt $18, $17, $16 ; 22: slt $s2, $s1, $s2
[0040004c] 1012000d beq $0, $18, 52 [end_loop-0x0040004c] ; 23: beq $0, $18, 52
[00400050] 34020001 ori $2, $0, 1 ; 25: li $v0, 1
[00400054] 00082021 addu $4, $0, $8 ; 26: move $a0, $t0
[00400058] 0000000c syscall ; 27: syscall
[0040005c] 34020004 ori $2, $0, 4 ; 29: li $v0, 4
[00400060] 3c011001 lui $1, 4097 [space] ; 30: la $a0, space
[00400064] 34240014 ori $4, $1, 20 [space] ; 31: syscall
[00400068] 0000000c syscall ; 31: syscall
[0040006c] 00095021 addu $10, $0, $9 ; 33: move $t2, $t1
[00400070] 01094820 add $9, $8, $9 ; 34: add $t1, $t0, $t0
[00400074] 000a4021 addu $8, $0, $10 ; 35: move $t0, $t2
[00400078] 22310001 addi $17, $17, 1 ; 37: addi $s1, 1
[0040007c] 08100012 j 0x00400048 [loop] ; 38: j loop
[00400080] 3402000a ori $2, $0, 10 ; 41: li $v0, 10
[00400084] 0000000c syscall ; 42: syscall
```

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Console

Enter the number : 10
0 1 1 2 3 5 8 13 21 34 |

Console

Enter the number : 10
0 1 1 2 3 5 8 13 21 34 |

Q2

QTSim

File Simulator Registers Text Segment Data Segment Window Help

FP Regs Int Regs [10] Data Text

Int Regs [10]

PC = 4194492
EPC = 0
Cause = 0
BadVAddr = 0
Status = 805371664
HI = 1
LO = 1
R0 [r0] = 0
R1 [at] = 268500992
R2 [v0] = 10
R3 [v1] = 0
R4 [a0] = 268501045
R5 [a1] = 2147481016
R6 [a2] = 2147481028
R7 [a3] = 0
R8 [t0] = 13
R9 [t1] = 1
R10 [t2] = 0
R11 [t3] = 0
R12 [t4] = 0
R13 [t5] = 0
R14 [t6] = 0
R15 [t7] = 0
R16 [s0] = 11
R17 [s1] = 13
R18 [s2] = 0
R19 [s3] = 0
R20 [s4] = 0
R21 [s5] = 0

Text

```
[00400044] 3424001a ori $4, $1, 26 [msg2]
[00400048] 0000000c syscall ; 21: syscall
[0040004c] 34020005 ori $2, $0, 5 ; 23: li $v0,5
[00400050] 0000000c syscall ; 24: syscall
[00400054] 00028821 addu $17, $0, $2 ; 25: move $s1,$v0
[00400058] 00102021 addu $4, $0, $16 ; 27: move $a0,$s0
[0040005c] 0c100030 jal 0x004000c0 [is_prime]; 28: jal is_prime
[00400060] 1002000c beq $0, $2, 48 [not_twinprime-0x00400060]
[00400064] 00112021 addu $4, $0, $17 ; 31: move $a0,$s1
[00400068] 0c100030 jal 0x004000c0 [is_prime]; 32: jal is_prime
[0040006c] 10020009 beq $0, $2, 36 [not_twinprime-0x0040006c]
[00400070] 0230502a slt $10, $17, $16 ; 35: slt $t2,$s1,$s0
[00400074] 100a0004 beq $0, $10, 16 [case-0x00400074]
[00400078] 22280002 addi $8, $17, 2 ; 38: addi $t0,$s1,2
[0040007c] 16080005 bne $16, $8, 20 [not_twinprime-0x0040007c]
[00400080] 08100029 j 0x004000a4 [twinprime]; 41: j twinprime
[00400084] 22080002 addi $8, $16, 2 ; 44: addi $t0,$s0,2
[00400088] 16280002 bne $17, $8, 8 [not_twinprime-0x00400088]
[0040008c] 08100029 j 0x004000a4 [twinprime]; 46: j twinprime
[00400090] 34020004 ori $2, $0, 4 ; 49: li $v0,4
[00400094] 3c011001 lui $1, 4097 [ans2]; 50: la $a0,ans2
[00400098] 3424004a ori $4, $1, 74 [ans2]
[0040009c] 0000000c syscall ; 51: syscall
[004000a0] 0810002e j 0x004000b8 [end]; 53: j end
[004000a4] 34020004 ori $2, $0, 4 ; 56: li $v0,4
[004000a8] 3c011001 lui $1, 4097 [ans1]; 57: la $a0,ans1
[004000ac] 34240035 ori $4, $1, 53 [ans1]
[004000b0] 0000000c syscall ; 58: syscall
[004000b4] 0810002e j 0x004000b8 [end]; 60: j end
[004000b8] 3402000a ori $2, $0, 10 ; 63: li $v0,10
[004000bc] 0000000c syscall ; 64: syscall
```

Console

```
Enter the first number : 11
Enter the Second number : 13
They are twin prime
```

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Console

```
Enter the first number : 11
Enter the Second number : 13
They are twin prime
```

Q3.

QtSpim

File Simulator Registers Text Segment Data Segment Window Help

FP Regs Int Regs [10] Data Text

Int Regs [10]

PC = 4194524
EPC = 0
Cause = 0
BadVAddr = 0
Status = 805371664
HI = 0
LO = 0
R0 [r0] = 0
R1 [at] = 268500992
R2 [v0] = 10
R3 [v1] = 0
R4 [a0] = 268501062
R5 [a1] = 500
R6 [a2] = 2147481028
R7 [a3] = 0
R8 [t0] = 0
R9 [t1] = 10
R10 [t2] = 0
R11 [t3] = 0
R12 [t4] = 0
R13 [t5] = 0
R14 [t6] = 0
R15 [t7] = 0
R16 [s0] = 268501571
R17 [s1] = 268502074
R18 [s2] = 268501083
R19 [s3] = 0
R20 [s4] = 0
R21 [s5] = 0

Text

```
[00400064] 0000000c syscall ; 28: syscall
[00400068] 3c011001 lui $1, 4097 [string1] ; 30: la $s0,string1
[0040006c] 3430023a ori $16, $1, 570 [string1]
[00400070] 3c011001 lui $1, 4097 [string2] ; 31: la $s1,string2
[00400074] 3431042e ori $17, $1, 1070 [string2]
[00400078] 3c011001 lui $1, 4097 [output] ; 32: la $s2,output
[0040007c] 34320046 ori $18, $1, 70 [output]
[00400080] 82080000 lb $8, 0($16) ; 35: lb $t0,($s0)
[00400084] 11000007 beq $8, $0, 28 [loop2-0x00400084]
[00400088] 2009000a addi $9, $0, 10 ; 37: addi $t1,$zero,10
[0040008c] 11090005 beq $8, $9, 20 [loop2-0x0040008c]
[00400090] a2480000 sb $8, 0($18) ; 39: sb $t0,($s2)
[00400094] 22100001 addi $16, $16, 1 ; 40: addi $s0,$s0,1
[00400098] 22520001 addi $18, $18, 1 ; 41: addi $s2,$s2,1
[0040009c] 08100020 j 0x00400080 [loop1] ; 42: j loop1
[004000a0] 82280000 lb $8, 0($17) ; 45: lb $t0,($s1)
[004000a4] 11000005 beq $8, $0, 20 [print-0x004000a4]
[004000a8] a2480000 sb $8, 0($18) ; 47: sb $t0,($s2)
[004000ac] 22310001 addi $17, $17, 1 ; 48: addi $s1,$s1,1
[004000b0] 22520001 addi $18, $18, 1 ; 49: addi $s2,$s2,1
[004000b4] 08100028 j 0x004000a0 [loop2] ; 50: j loop2
[004000b8] 34020004 ori $2, $0, 4 ; 53: li $v0,4
[004000bc] 3c011001 lui $1, 4097 [ans] ; 54: la $a0,ans
[004000c0] 34240035 ori $4, $1, 53 [ans]
[004000c4] 0000000c syscall ; 55: syscall
[004000c8] 34020004 ori $2, $0, 4 ; 57: li $v0,4
[004000cc] 3c011001 lui $1, 4097 [output] ; 58: la $a0,output
[004000d0] 34240046 ori $4, $1, 70 [output]
[004000d4] 0000000c syscall ; 59: syscall
[004000d8] 3402000a ori $2, $0, 10 ; 61: li $v0,10
[004000dc] 0000000c syscall ; 62: syscall
```

Console

```
Enter the first string : My string
Enter the second string : Hello World
Output string : My stringHello World
```

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Console

```
Enter the first string : My string
Enter the second string : Hello World
Output string : My stringHello World
```

Q4

QtSpim

File Simulator Registers Text Segment Data Segment Window Help

FP Regs Int Regs [10] Data Text

Int Regs [10]

PC = 4194780
EPC = 0
Cause = 0
BadVAddr = 0
Status = 805371664
HI = 0
LO = 0
R0 [r0] = 0
R1 [at] = 268500992
R2 [v0] = 10
R3 [v1] = 0
R4 [a0] = 268501055
R5 [a1] = 500
R6 [a2] = 2147481028
R7 [a3] = 0
R8 [t0] = 0
R9 [t1] = 8
R10 [t2] = 3
R11 [t3] = 0
R12 [t4] = 10
R13 [t5] = 0
R14 [t6] = 0
R15 [t7] = 0
R16 [s0] = 268501104
R17 [s1] = 0
R18 [s2] = 0
R19 [s3] = 0
R20 [s4] = 0
R21 [s5] = 0

Text

```
[00400164] 3424002a ori $4, $1, 42 [ans2]
[00400168] 0000000c syscall ; 110: syscall
[0040016c] 0810005c j 0x00400170 [min_loop] ; 112: j min_loop
[00400170] 820b0000 lb $11, 0($16) ; 115: lb $t3,($s0)
[00400174] 200c0020 addi $12, $0, 32 ; 116: addi $t4,$zero,32
[00400178] 116c0007 beq $11, $12, 28 [check_min-0x00400178]
[0040017c] 200c000a addi $12, $0, 10 ; 118: addi $t4,$zero,10
[00400180] 116c0005 beq $11, $12, 20 [check_min-0x00400180]
[00400184] 11600015 beq $11, $0, 84 [exit-0x00400184]
[00400188] 22100001 addi $16, $16, 1 ; 121: addi $s0,$s0,1
[0040018c] 21080001 addi $8, $8, 1 ; 122: addi $t0,$t0,1
[00400190] 0810005c j 0x00400170 [min_loop] ; 123: j min_loop
[00400194] 150a000e bne $8, $10, 56 [skip2-0x00400194]
[00400198] 02080022 sub $16, $16, $8 ; 127: sub $s0,$s0,$t0
[0040019c] 82040000 lb $4, 0($16) ; 129: lb $a0,0($s0)
[004001a0] 3402000b ori $2, $0, 11 ; 130: li $v0,11
[004001a4] 0000000c syscall ; 131: syscall
[004001a8] 22100001 addi $16, $16, 1 ; 133: addi $s0,$s0,1
[004001ac] 2108ffff addi $8, $8, -1 ; 134: addi $t0,$t0,-1
[004001b0] 1500ffff bne $8, $0, -20 [loop2-0x004001b0]
[004001b4] 22100001 addi $16, $16, 1 ; 136: addi $s0,$s0,1
[004001b8] 34020004 ori $2, $0, 4 ; 138: li $v0,4
[004001bc] 3c011001 lui $1, 4097 [space] ; 139: la $a0,space
[004001c0] 3424003f ori $4, $1, 63 [space]
[004001c4] 0000000c syscall ; 140: syscall
[004001c8] 0810005c j 0x00400170 [min_loop] ; 142: j min_loop
[004001cc] 22100001 addi $16, $16, 1 ; 144: addi $s0,$s0,1
[004001d0] 20080000 addi $8, $0, 0 ; 145: addi $t0,$zero,0
[004001d4] 0810005c j 0x00400170 [min_loop] ; 146: j min_loop
[004001d8] 3402000a ori $2, $0, 10 ; 149: li $v0,10
[004001dc] 0000000c syscall ; 150: syscall
```

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Console

Enter the Sentence : This sentence contains large and short words
The Longest Word : sentence contains
The Shortest Word : and |

Q5

QtSPIM

File Simulator Registers Text Segment Data Segment Window Help

FP Regs Int Regs [10]

Int Regs [10]

PC = 4194664
EPC = 0
Cause = 0
BadVAddr = 0
Status = 805371664

HI = 0
LO = 0

R0 [r0] = 0
R1 [at] = 268500992
R2 [v0] = 10
R3 [v1] = 0
R4 [a0] = 268501105
R5 [a1] = 500
R6 [a2] = 2147481028
R7 [a3] = 0
R8 [t0] = 0
R9 [t1] = 99
R10 [t2] = 0
R11 [t3] = 10
R12 [t4] = 0
R13 [t5] = 0
R14 [t6] = 0
R15 [t7] = 0
R16 [s0] = 268501623
R17 [s1] = 268501123
R18 [s2] = 268502105
R19 [s3] = 268502305
R20 [s4] = 0
R21 [s5] = 0

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Text

```
[004000f0] 150a0009 bne $8, $10, 36 [loop_end-0x004000f0]
[004000f4] 022d8822 sub $17, $17, $13 ; 73: sub $s1,$s1,$t5
[004000f8] 826b0000 lb $11, 0($19) ; 75: lb $t3,($s3)
[004000fc] 200a000a addi $10, $0, 10 ; 76: addi $t2,$zero,10
[00400100] 116a0005 beq $11, $10, 20 [loop_end-0x00400100]
[00400104] a22b0000 sb $11, 0($17) ; 78: sb $t3,($s1)
[00400108] 22730001 addi $19, $19, 1 ; 79: addi $s3,$s3,1
[0040010c] 22310001 addi $17, $17, 1 ; 80: addi $s1,$s1,1
[00400110] 0810003e j 0x004000f8 [loop] ; 81: j loop
[00400114] 026d9822 sub $19, $19, $13 ; 83: sub $s3,$s3,$t5
[00400118] 024d9022 sub $18, $18, $13 ; 84: sub $s2,$s2,$t5
[0040011c] 200d0000 addi $13, $0, 0 ; 85: addi $t5,$zero,0
[00400120] 0810002c j 0x004000b0 [solve] ; 86: j solve
[00400124] a2280000 sb $8, 0($17) ; 89: sb $t0,($s1)
[00400128] 22100001 addi $16, $16, 1 ; 90: addi $s0,$s0,1
[0040012c] 22310001 addi $17, $17, 1 ; 91: addi $s1,$s1,1
[00400130] 024d9022 sub $18, $18, $13 ; 92: sub $s2,$s2,$t5
[00400134] 200d0000 addi $13, $0, 0 ; 93: addi $t5,$zero,0
[00400138] 0810002c j 0x004000b0 [solve] ; 95: j solve
[0040013c] 20080000 addi $8, $0, 0 ; 98: addi $t0,$zero,0
[00400140] a2280000 sb $8, 0($17) ; 99: sb $t0,($s1)
[00400144] 34020004 ori $2, $0, 4 ; 101: li $v0,4
[00400148] 3c011001 lui $1, 4097 [ans] ; 102: la $a0,ans
[0040014c] 3424004f ori $4, $1, 79 [ans]
[00400150] 0000000c syscall ; 103: syscall
[00400154] 34020004 ori $2, $0, 4 ; 105: li $v0,4
[00400158] 3c011001 lui $1, 4097 [output] ; 106: la $a0,output
[0040015c] 34240071 ori $4, $1, 113 [output]
[00400160] 0000000c syscall ; 107: syscall
[00400164] 3402000a ori $2, $0, 10 ; 109: li $v0,10
[00400168] 0000000c syscall ; 110: syscall
```

Console

```
Enter the Sentence : This cap that cap
Enter the Word to Search : cap
Enter the Word to Replace : hat
The Sentence after Replacement : This hat that hat
```

Console

```
Enter the Sentence : This cap that cap
Enter the Word to Search : cap
Enter the Word to Replace : hat
The Sentence after Replacement : This hat that hat
```