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CS 264

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Lab 1

**Code:**

.data

array: .space 80

prompt1:.asciiz "Please enter an integer: "

prompt2:.asciiz "\nYour integers, one per line:\n"

prompt3:.asciiz "\nYour integers in order: "

prompt4:.asciiz "\nYour integers in reverse: "

prompt5:.asciiz "\nPlease enter a positive integer, between 1 and 20: "

prompt6:.asciiz "\nYour integers, separated by the entered number per line:\n"

newline:.asciiz "\n"

space: .asciiz " "

.text

.globl main

main: la $t0, array

li $t1, 0 #number of integers entered

li $t2, 20 #loop counter

loop: beq $t1, $t2, print1 #if integers = 20, move to print

la $a0, prompt1

li $v0, 4 #syscall 4 - print string

syscall

li $v0, 5 #syscall 5 - read integer

syscall

sw $v0, 0($t0) #store in array

addi $t1, $t1, 1 #increment integer counter

addi $t0, $t0, 4 #next array position

b loop #loop back to beginning

print1: la $a0, prompt2

li $v0, 4 #syscall 4 - print string

syscall

li $a1, 0 #initialize a1

b print1l

print1l:la $t5, array($a1) #set to array[i]

lw $a0, 0($t5) #load array[i]

li $v0, 1 #syscall 1 - print integer

syscall

li $v0, 4 #syscall 4 - print string

la $a0, newline

syscall

addi $t2, $t2, -1 #decrement loop counter

addi $a1, $a1, 4 #i+1

bnez $t2, print1l

print2: la $a0, prompt3

li $v0, 4 #syscall 4 - print string

syscall

li $t2, 20 #set loop counter back to 20

li $a1, 0 #initialize a1

b print2l

print2l:la $t5, array($a1) #set to array[i]

lw $a0, 0($t5) #load array[i]

li $v0, 1 #syscall 1 - print integer

syscall

li $v0, 4 #syscall 4 - print string

la $a0, space

syscall

addi $t2, $t2, -1 #decrement loop counter

addi $a1, $a1, 4 #i+1

bnez $t2, print2l

li $v0, 4 #syscall 4 - print string

la $a0, newline

syscall

print3: la $a0, prompt4

li $v0, 4 #syscall 4 - print string

syscall

li $t2, 20 #set loop counter back to 20

addi $a1, $a1, -4 #set a1 to end of array

b print3l

print3l:la $t5, array($a1) #set to array[i]

lw $a0, 0($t5) #load array[i]

li $v0, 1 #syscall 1 - print integer

syscall

li $v0, 4 #syscall 4 - print string

la $a0, space

syscall

addi $t2, $t2, -1 #decrement loop counter

addi $a1, $a1, -4 #i-1

bnez $t2, print3l

li $v0, 4 #syscall 4 - print string

la $a0, newline

syscall

print4: la $a0, prompt5

li $v0, 4 #syscall 4 - print string

syscall

li $v0, 5 #syscall 5 - read integer

syscall

move $t6, $v0 #store integer for how many per line

li $t1, 0 #initialize integer per line counter

li $t2, 20 #set loop counter back to 20

li $a1, 0 #initialize a1

b print4l

print4l:la $t5, array($a1) #set to array[i]

lw $a0, 0($t5) #load array[i]

li $v0, 1 #syscall 1 - print integer

syscall

li $v0, 4 #syscall 4 - print string

la $a0, space

syscall

addi $t1, $t1, 1 #increment integer per line counter

addi $t2, $t2, -1 #decrement loop counter

addi $a1, $a1, 4 #i+1

blez $t2, end #no more integers; end of program

beq $t1, $t6, lbreak #if entered integers are equal to entered number per line, new line

b print4l

lbreak: li $v0, 4 #syscall 4 - print string

la $a0, newline

syscall

li $t1, 0 #set number per line back to 0

b print4l

end: li $v0, 10 #syscall 10 - end program

syscall

**Output:**

**n=5**

Please enter an integer: 1

Please enter an integer: 2

Please enter an integer: 3

Please enter an integer: 4

Please enter an integer: 5

Please enter an integer: 6

Please enter an integer: 7

Please enter an integer: 8

Please enter an integer: 9

Please enter an integer: 10

Please enter an integer: 11

Please enter an integer: 12

Please enter an integer: 13

Please enter an integer: 14

Please enter an integer: 15

Please enter an integer: 16

Please enter an integer: 17

Please enter an integer: 18

Please enter an integer: 19

Please enter an integer: 20

Your integers, one per line:

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

Your integers in order: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Your integers in reverse: 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Please enter a positive integer, between 1 and 20: 5

1 2 3 4 5

6 7 8 9 10

11 12 13 14 15

16 17 18 19 20

**n=6**

Please enter an integer: 1

Please enter an integer: 2

Please enter an integer: 3

Please enter an integer: 4

Please enter an integer: 5

Please enter an integer: 6

Please enter an integer: 7

Please enter an integer: 8

Please enter an integer: 9

Please enter an integer: 10

Please enter an integer: 11

Please enter an integer: 12

Please enter an integer: 13

Please enter an integer: 14

Please enter an integer: 15

Please enter an integer: 16

Please enter an integer: 17

Please enter an integer: 18

Please enter an integer: 19

Please enter an integer: 20

Your integers, one per line:

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

Your integers in order: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Your integers in reverse: 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Please enter a positive integer, between 1 and 20: 6

1 2 3 4 5 6

7 8 9 10 11 12

13 14 15 16 17 18

19 20