Purpose: Write a MIPS program that will utilize arrays and functions to sort a list of numbers.

Write a MIPS program from scratch. Use the provided text file of numbers to declare a signed word sized array.

Instructions

The program will use a cocktail sort to sort a list of numbers in ascending order.

A cocktail sort is a sorting algorithm that compares neighboring elements to see if they are in order, swapping the values if they are out of order. The sort begins at the start of the array and makes comparisons to the end. Then, it compares from the end back to the start. The algorithm repeats this front to back, back to front scanning until all the elements are sorted.

Each time the algorithm scans from beginning to end (shakes right), the largest value will be put at the end of the list. Each time the algorithm scans from the end to the start (shakes left), the smallest value will be moved to the start of the list. To make the algorithm more efficient, these largest and smallest values should be ignored for further consideration. Additionally, if no swaps are made, all elements remaining in the list are in order and the scanning can stop.

Sort the provided numbers and find the median value. Since the list consists of exactly 100 numbers, average the two middle values to find the median. Print the unsorted list, the sorted list, and the median value to the console. Print 5 numbers per line.

You must write two functions: shake left and shake right. Each should take two arguments, the array by reference and the number of elements in the array.

Submission

Once completed, upload the MIPS assembly source code file (.asm) to the class website.

Example Execution

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Unsorted List:
57 307 757 64 335
832 885 475 25 309
258 439 285 685 934
881 345 64 742 776
316 778 818 356 482
628 283 444 537 921
676 428 288 587 569
420 706 395 25 852
402 930 196 68 745
70 698 87 384 144
353 345 782 45 510
296 315 2 309 676
556 794 45 289 423
79 899 337 71 525
16 313 291 763 437
855 125 419 582 70
948 112 220 131 369
332 282 196 470 152
935 753 197 964 362
998 371 838 338 644

Sorted List:
2 16 25 25 45
45 57 64 64 68
70 70 71 79 87
112 125 131 144 152
196 196 197 220 258
282 283 285 288 289
291 296 307 309 309
313 315 316 332 335
337 338 345 345 353
356 362 369 371 384
395 402 419 420 423
428 437 439 444 470
475 482 510 525 537
556 569 582 587 628
644 676 676 685 698
706 742 745 753 757
763 776 778 782 794
818 832 838 852 855
881 885 899 921 930
934 935 948 964 998

Median: 389
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