Test2: Counting Inversions

Presented By

Nabila Shahnaz Khan

INPUT

For input two types of options are given:

➢ **Option 1:** User can take input from STDIN

➢ **Option 2:** User can take input from input file

#Command:: **$python3 Test2.py <option> <input>**

***Using '-h' command, user can also ask for help

INPUT

Option 1: Input from STDIN
Command:: $python3 Test2.py 1 <input_array>
Example:: $python3 Test2.py 1 [10 9 8 7 6 5 4 3 2 1]
Example:: $python3 Test2.py 1 [10, 9, 8, 7, 6, 5, 4, 3, 2, 1]
Example (where array contains new line)::
$python3 Test2.py 1 $'[620 147 382 872 643 741 491
232 754 464 898 405 179 194 828 895 788 769 30
170 527 301 116 385 108 36 423 797 434 673 517]'

Option 2: Input from input file
Command:: $python3 Test2.py 2 <file_name>
Example:: $python3 Test2.py 2 test1000000.txt

HELP:
Command:: $python3 Test2.py

or,

Command :: $python3 Test2.py 2 -h

OUTPUT

#Gives the number of inversions as output in the following format:

"Number of total inversions is:" <total_conversion_number>

Example: **Number of total inversions is: 45**

Simple Test Case

#For STDIN input of array [10 9 8 7 6 5 4 3 2 1]

```
File  Edit  View  Search  Terminal  Help
nabila@Nabila:~/Masters/Spring 2020/Test2$ python3 Test2.py 1 [10 9 8 7 6 5 4 3 2 1]
Number of total inversions is:  45
nabila@Nabila:~/Masters/Spring 2020/Test2$ ▯
```

```
                     nabila@Nabila: ~/Masters/Spring 2020/Test2                    — □ ✕
File  Edit  View  Search  Terminal  Help
nabila@Nabila:~/Masters/Spring 2020/Test2$ python3 Test2.py 1 [10, 9, 8, 7, 6, 5
, 4, 3, 2, 1]
Number of total inversions is:  45
nabila@Nabila:~/Masters/Spring 2020/Test2$ ▯
```

Test Case 1 (From STDIN)

#For input file "test1000.txt" (cropped the images as too large)

```
nabila@Nabila:~/Masters/Spring 2020/Test2/Test2_Submission$ python3 Test2.py 1 $'[620 147 382 872 643
>  232 754 464 898 405 179 194 828 895 788 769  30 438  58 143 201 938 729
>  811 170 527 301 116 385 108  36 423 797 434 673 517 793 857 961  73 624
>  231 730 817 514  63 731 287 229  85 449 341 483 584 556  39 675 652  66
>  968 798 222 999 783 841 127 285  40  99 614 711  82 254 169 121 587 117
>  830 772  95 115 540 454 184 185 848 638 931 816 599 580 780 781 188 827
>  107 538 182 765 950 552 832 680 566 836 122 417 724  43 218 363 374 742
>   26 955 967 932 934 585 947 312  87 943 574 446 378 845 494 623 512 327
>  399 131 492 992 575   8 648 168 278 187 134 625 653 601 598 403 863 819
>  263 103 639 209  46 960 688 954 472 981 988 892 329 543 923 775 392 520
>  239 529  25  31 460   6 442 258 468 422 264 607 864 753 876 854 896  38
>  558   5 445 685 299 612 840 206 306 526 658 535 230 443 420 694 248 842
>  996 204 550 154 557 921 101 839 834 137 578 642 899 395 789 606 330 980
>  536 227  60 366  34 768 978 626 521 548 328 178 326 758 922 594 523 290
>   77  93 885 650 659 704 928 524 563 451 271 805 279 631  64 353 583 707
>  537  79 925 822 277 404 174  88 256 519 676 888 795 766 589 837  76 242
>  368 853 432 874 198 632 700 346 937 762 408 670 498 389 637 621 838 448
>  684 633 803 823 293  22 133 104 755 627 721 897 693 400 383 687 373  67
>  130 738 284 812  55 581 883 735 555 759 356 456 463 274 334 223 554 750
>  875 924 193 573  33   2 190 744 465 647 852 159 205 710 746 394 815 695
>  253 785 809 352 984 948  56 214 732 339]'
Number of total inversions is:  251691
nabila@Nabila:~/Masters/Spring 2020/Test2/Test2_Submission$
```

Test Case 1(from input file)

#For input file "test1000.txt"

Running in Personal Laptop (Quad Core, RAM 8GB)

#Runtime:: 0.049411793 s

#Memory:: RSS (resident set size) = 12.357632 MB

Test Case 2

#For input file "test10000.txt"

```
nabila@Nabila: ~/Masters/Spring 2020/Test2

File  Edit  View  Search  Terminal  Help
nabila@Nabila:~/Masters/Spring 2020/Test2$ python3 Test2.py 2 test10000.txt
Number of total inversions is:  25105870
nabila@Nabila:~/Masters/Spring 2020/Test2$ 
```

#Runtime:: 0.07913768800000001 s

#Memory:: RSS (resident set size) = 13.426688 MB

Test Case 3

#For input file "test100000.txt"

#Runtime:: 0.40266794 s

#Memory:: RSS (resident set size) = 18.087936 MB

Test Case 4

#For input file "test1000000.txt"

#Runtime:: 4.478657145 s

#Memory:: RSS (resident set size) = 68.28032 MB

HELP

#For help command

THANK YOU