**Test case 1**

Please enter the contact file name:

PhoneBook-sample1.txt

Please enter the word to be queried :

Gulsen Demiroz

Sorting the vector copies

======================================

Quick Sort Time: 6643 Nanoseconds

Insertion Sort Time: 7184 Nanoseconds

Merge Sort Time: 8876 Nanoseconds

Heap Sort Time: 9142 Nanoseconds

Searching for Gulsen Demiroz

======================================

**GULSEN DEMIROZ does NOT exist in the dataset**

Binary Search Time: 1476 Nanoseconds

Search results for Sequential Search:

**GULSEN DEMIROZ does NOT exist in the dataset**

Sequential Search Time: 3644 Nanoseconds

SpeedUp between Search Algorithms

**======================================**

**(Sequential Search/ Binary Search) SpeedUp = 2.46883**

SpeedUps between Sorting Algorithms

======================================

**(Insertion Sort/ Quick Sort) SpeedUp = 1.08144**

**(Merge Sort / Quick Sort) SpeedUp = 1.33614**

**(Heap Sort / Quick Sort) SpeedUp = 1.37619**

**Test case 2**

Please enter the contact file name:

PhoneBook-sample2.txt

Please enter the word to be queried :

Vicki Rodriguez

Sorting the vector copies

======================================

Quick Sort Time: 100468 Nanoseconds

Insertion Sort Time: 511350 Nanoseconds

Merge Sort Time: 396585 Nanoseconds

Heap Sort Time: 153036 Nanoseconds

Searching for Vicki Rodriguez

======================================

**VICKI RODRIGUEZ +905594579280 Izmir**

Binary Search Time: 1613 Nanoseconds

Search results for Sequential Search:

**VICKI RODRIGUEZ +905594579280 Izmir**

Sequential Search Time: 34183 Nanoseconds

SpeedUp between Search Algorithms

======================================

**(Sequential Search/ Binary Search) SpeedUp = 21.1922**

SpeedUps between Sorting Algorithms

======================================

**(Insertion Sort/ Quick Sort) SpeedUp = 5.08968**

**(Merge Sort/ Quick Sort) SpeedUp = 3.94738**

**(Heap Sort/ Quick Sort) SpeedUp = 1.52323**

**Test case 3**

Please enter the contact file name:

PhoneBook-shuffled.txt

Please enter the word to be queried :

Wayne Porter

Sorting the vector copies

======================================

Quick Sort Time: 1987097 Nanoseconds

Insertion Sort Time: 91465500 Nanoseconds

Merge Sort Time: 44506643 Nanoseconds

Heap Sort Time: 3560308 Nanoseconds

Searching for Wayne Porter

======================================

**WAYNE PORTER +905537693471 Istanbul**

Binary Search Time: 2079 Nanoseconds

Search results for Sequential Search:

**WAYNE PORTER +905537693471 Istanbul**

Sequential Search Time: 516036 Nanoseconds

SpeedUp between Search Algorithms

======================================

**(Sequential Search/ Binary Search) SpeedUp = 248.214**

SpeedUps between Sorting Algorithms

======================================

**(Insertion Sort/ Quick Sort) SpeedUp = 46.0297**

**(Merge Sort/ Quick Sort) SpeedUp = 22.3978**

**(Heap Sort/ Quick Sort) SpeedUp = 1.79171**

**Test case 4**

Please enter the contact file name:

PhoneBook-shuffled.txt

Please enter the word to be queried :

Jam

Sorting the vector copies

======================================

Quick Sort Time: 2008468 Nanoseconds

Insertion Sort Time: 134234839 Nanoseconds

Merge Sort Time: 84268693 Nanoseconds

Heap Sort Time: 4481497 Nanoseconds

Searching for Jam

======================================

**JAMES ADCOCK +905574254945 Mugla**

**JAMES ALEXANDRE +905543083389 Bursa**

**JAMES ALLEN +905556983566 Bursa**

**JAMES BACCHUS +905534318396 Bursa**

**JAMES BARNES +905573326915 Bursa**

**JAMES BASSETT +905565145082 Bursa**

**JAMES BLAKELY +905517751965 Mugla**

**JAMES BOELENS +905523276361 Bursa**

**JAMES BOYETT +905518675969 Mugla**

**JAMES BYARD +905571006602 Bursa**

**JAMES CABALLERO +905558086341 Izmir**

**JAMES CAMPBELL +905598951385 Ankara**

**JAMES CARROLL +905532871482 Ankara**

**JAMES CASTRO +905532984243 Ankara**

**JAMES CHISM +905592779687 Bursa**

**JAMES COOK +905597029088 Ankara**

**JAMES CORKINS +905530683523 Istanbul**

**JAMES CORR +905588265230 Izmir**

**JAMES CRAWFORD +905552019434 Istanbul**

**JAMES CURRAN +905532814889 Mugla**

**JAMES CZORA +905524440355 Mugla**

**JAMES DAWICKI +905516102525 Ankara**

**JAMES DECKER +905529432768 Ankara**

**JAMES DELOSSANTOS +905590556999 Ankara**

**JAMES EFFORD +905522077435 Ankara**

**JAMES ELKINS +905546804753 Bursa**

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**JAMES FINNEY +905594101923 Ankara**

**JAMES FONT +905546452439 Mugla**

**JAMES FOWLER +905541486561 Istanbul**

**JAMES GARCIA +905568963076 Ankara**

**JAMES GEE +905563613742 Bursa**

**JAMES GONZALEZ +905572154768 Istanbul**

**JAMES GUIRGIS +905540248050 Bursa**

**JAMES HARRIS +905596150285 Bursa**

**JAMES HEAVRIN +905589716660 Bursa**

**JAMES HEDGE +905513288588 Ankara**

**JAMES HEIDKAMP +905580708359 Izmir**

**JAMES HOWARD +905539994645 Ankara**

**JAMES HOWLEY +905566770961 Bursa**

**JAMES HUNT +905593871576 Mugla**

**JAMES HUNTER +905558981117 Istanbul**

**JAMES JACOBS +905561725615 Istanbul**

**JAMES JANSEN +905519934526 Izmir**

**JAMES JOHNSON +905570966838 Izmir**

**JAMES KELLER +905588831793 Ankara**

**JAMES LINDSEY +905531051955 Mugla**

**JAMES LITCHFORD +905510941482 Mugla**

**JAMES LOZA +905514750233 Istanbul**

**JAMES MAERTZ +905513059565 Istanbul**

**JAMES MANESS +905555705312 Izmir**

**JAMES MANSANAREZ +905590394979 Istanbul**

**JAMES MARKOWSKI +905590544013 Mugla**

**JAMES MATHIS +905512202065 Ankara**

**JAMES MAULL +905571461043 Ankara**

**JAMES MCALLISTER +905583876091 Ankara**

**JAMES MCGEE +905587810093 Izmir**

**JAMES MELICAN +905589475583 Istanbul**

**JAMES MERRELL +905533115074 Mugla**

**JAMES MIXON +905546915708 Izmir**

**JAMES MONTIE +905534079663 Mugla**

**JAMES MOORE +905591928144 Bursa**

**JAMES MORRIS +905546933464 Mugla**

**JAMES NUNO +905536236823 Izmir**

**JAMES PADILLA +905538088475 Istanbul**

**JAMES PEARCE +905560536843 Bursa**

**JAMES PERRINE +905595740261 Izmir**

**JAMES PHAM +905549969462 Ankara**

**JAMES PLANTE +905516891470 Izmir**

**JAMES PRESSER +905531799438 Ankara**

**JAMES QUINN +905532875774 Istanbul**

**JAMES RITTHALER +905512016902 Istanbul**

**JAMES ROCCO +905583061353 Mugla**

**JAMES RODRIGUEZ +905534606588 Istanbul**

**JAMES ROGERS +905551743414 Izmir**

**JAMES SALYER +905560578338 Ankara**

**JAMES SANDOVAL +905527251348 Ankara**

**JAMES SCHMIDT +905545458791 Bursa**

**JAMES SELL +905578445926 Istanbul**

**JAMES SKYLES +905546978452 Istanbul**

**JAMES SODEMAN +905547519380 Mugla**

**JAMES STANLEY +905589773859 Izmir**

**JAMES STIEGLER +905584033337 Mugla**

**JAMES STOUT +905556664656 Bursa**

**JAMES TAYLOR +905556046179 Istanbul**

**JAMES THOMAS +905570636994 Mugla**

**JAMES TODD +905576644412 Mugla**

**JAMES TORRES +905512487239 Bursa**

**JAMES TRICHE +905599582416 Istanbul**

**JAMES VANDEWALKER +905530141293 Izmir**

**JAMES VAYDA +905533163931 Mugla**

**JAMES WILLIAMS +905517425200 Istanbul**

**JAMES YEOMAN +905555476299 Izmir**

**JAMEY SUTTERFIELD +905528709675 Ankara**

**JAMI PFEFFER +905591020626 Mugla**

**JAMIE BELL +905527953327 Izmir**

**JAMIE FELLNER +905570561781 Izmir**

**JAMIE GRIFFIN +905559698100 Izmir**

**JAMIE GRILLO +905531889277 Izmir**

**JAMIE HERNANDEZ +905544779434 Izmir**

Binary Search Time: 14500 Nanoseconds

Search results for Sequential Search:

**JAMES ADCOCK +905574254945 Mugla**

**JAMES ALEXANDRE +905543083389 Bursa**

**JAMES ALLEN +905556983566 Bursa**

**JAMES BACCHUS +905534318396 Bursa**

**JAMES BARNES +905573326915 Bursa**

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**JAMES LITCHFORD +905510941482 Mugla**

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**JAMIE GRIFFIN +905559698100 Izmir**

**JAMIE GRILLO +905531889277 Izmir**

**JAMIE HERNANDEZ +905544779434 Izmir**

Sequential Search Time: 669202 Nanoseconds

SpeedUp between Search Algorithms

======================================

**(Sequential Search/ Binary Search) SpeedUp = 46.1519**

SpeedUps between Sorting Algorithms

======================================

(Insertion Sort/ Quick Sort) SpeedUp = 66.8344

(Merge Sort / Quick Sort) SpeedUp = 41.9567

(Heap Sort / Quick Sort) SpeedUp = 2.2313

**Test case 5**

Please enter the contact file name:

PhoneBook-shuffled.txt

Please enter the word to be queried :

Staci Weed

Sorting the vector copies

======================================

Quick Sort Time: 2001584 Nanoseconds

Insertion Sort Time: 93222850 Nanoseconds

Merge Sort Time: 49556519 Nanoseconds

Heap Sort Time: 4417767 Nanoseconds

Searching for Staci Weed

======================================

**STACI WEED +905584013624 Ankara**

Binary Search Time: 3278 Nanoseconds

Search results for Sequential Search:

**STACI WEED +905584013624 Ankara**

Sequential Search Time: 469326 Nanoseconds

SpeedUp between Search Algorithms

======================================

**(Sequential Search/ Binary Search) SpeedUp = 143.174**

SpeedUps between Sorting Algorithms

======================================

(Insertion Sort/ Quick Sort) SpeedUp = 46.5745

(Merge Sort / Quick Sort) SpeedUp = 24.7587

(Heap Sort / Quick Sort) SpeedUp = 2.20714