

## Assignment 8\_Sample Output

### Video Link for Assignment 8:

[https://unlv.zoom.us/rec/share/lwm3WvDfePwQEeSL2ZMVIXfxLROdy21LPId7\\_C18p4NFUTB-\\_gaq70QOB\\_ExYLS.0C2E\\_vinEX9mWg\\_Z?pwd=eRODbVn7KH-7PQg6I5aHq1zCDpgI8Q3E](https://unlv.zoom.us/rec/share/lwm3WvDfePwQEeSL2ZMVIXfxLROdy21LPId7_C18p4NFUTB-_gaq70QOB_ExYLS.0C2E_vinEX9mWg_Z?pwd=eRODbVn7KH-7PQg6I5aHq1zCDpgI8Q3E)

### Sample Output 1:

```
kishore@kishore-virtual-machine:/Linked_Lists_Ast8$ make
g++ -Wall -Wextra -pedantic -std=c++11 -g -c main.cpp
g++ -c -o CalculateGradeImp.o CalculateGradeImp.cpp
g++ -Wall -Wextra -pedantic -std=c++11 -g -o main main.o CalculateGradeImp.o
kishore@kishore-virtual-machine:/Linked_Lists_Ast8$ valgrind --tool=memcheck --leak-check=yes --
show-reachable=yes --show-leak-kinds=all --track-origins=yes ./main
==4577== Memcheck, a memory error detector
==4577== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==4577== Using Valgrind-3.15.0 and LibVEX; rerun with -h for copyright info
==4577== Command: ./main
==4577==
```

Menu:

1. Sort data from file
2. Sort sample data
3. Take 3 user inputs and sort
4. Insert a student to studentsData.txt

Enter choice: 1

Sort data by:

1. Age
2. Grade (A to F)
3. Sort Low to High (F to A, if letter grade is the same, youngest age is at the top)

Enter sorting criteria: 1

Result written to file sortedFileData.txt

Students from File:

Student 1 details

Name: Paul

Age: 25

Midterm1: 89

Midterm2: 76

FinalExam: 99

Total: 264

Grade: B

Student 2 details

Name: Sam

Age: 27

Midterm1: 99

Midterm2: 87

FinalExam: 86

Total: 272

Grade: A

Student 3 details

Name: Alice

Age: 22

Midterm1: 78

Midterm2: 85

FinalExam: 92

Total: 255

Grade: B

Student 4 details

Name: Bob

Age: 23

Midterm1: 95

Midterm2: 88

FinalExam: 78

Total: 261

Grade: B

Student 5 details

Name: Cathy

Age: 26

Midterm1: 85

Midterm2: 70

FinalExam: 78

Total: 233

Grade: C

Student 6 details

Name: David

Age: 24

Midterm1: 82

Midterm2: 94

FinalExam: 87

Total: 263

Grade: B

Student 7 details

Name: Emily

Age: 28

Midterm1: 76

Midterm2: 65

FinalExam: 60

Total: 201

Grade: F

Student 8 details

Name: Frank

Age: 29  
Midterm1: 95  
Midterm2: 91  
FinalExam: 100  
Total: 286  
Grade: A

Student 9 details  
Name: Grace  
Age: 30  
Midterm1: 94  
Midterm2: 78  
FinalExam: 88  
Total: 260  
Grade: B

Student 10 details  
Name: Hank  
Age: 31  
Midterm1: 75  
Midterm2: 86  
FinalExam: 90  
Total: 251  
Grade: B

Student 11 details  
Name: Jonathan  
Age: 33  
Midterm1: 98  
Midterm2: 67  
FinalExam: 100  
Total: 265  
Grade: B

Students from Sample:  
Student 12 details  
Name: Lisa  
Age: 21  
Midterm1: 88  
Midterm2: 99  
FinalExam: 77  
Total: 264  
Grade: B

Student 13 details  
Name: Kyle  
Age: 32  
Midterm1: 78  
Midterm2: 76

FinalExam: 75  
Total: 229  
Grade: C

Student 14 details

Name: Andy  
Age: 25  
Midterm1: 92  
Midterm2: 88  
FinalExam: 95  
Total: 275  
Grade: A

Student 15 details

Name: Jason  
Age: 28  
Midterm1: 65  
Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

Student 16 details

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82  
Total: 247  
Grade: B

```
==4577==  
==4577== HEAP SUMMARY:  
==4577==    in use at exit: 0 bytes in 0 blocks  
==4577== total heap usage: 30 allocs, 30 frees, 102,016 bytes allocated  
==4577==  
==4577== All heap blocks were freed -- no leaks are possible  
==4577==  
==4577== For lists of detected and suppressed errors, rerun with: -s  
==4577== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

kishore@kishore-virtual-machine:/Linked\_Lists\_Ast8/\$ cat sortedFileData.txt

Student 1 details:

Name: Jonathan  
Age: 33  
Midterm1: 98  
Midterm2: 67  
FinalExam: 100  
Total: 265

Grade: B

Student 2 details:

Name: Hank

Age: 31

Midterm1: 75

Midterm2: 86

FinalExam: 90

Total: 251

Grade: B

Student 3 details:

Name: Grace

Age: 30

Midterm1: 94

Midterm2: 78

FinalExam: 88

Total: 260

Grade: B

Student 4 details:

Name: Frank

Age: 29

Midterm1: 95

Midterm2: 91

FinalExam: 100

Total: 286

Grade: A

Student 5 details:

Name: Emily

Age: 28

Midterm1: 76

Midterm2: 65

FinalExam: 60

Total: 201

Grade: F

Student 6 details:

Name: Sam

Age: 27

Midterm1: 99

Midterm2: 87

FinalExam: 86

Total: 272

Grade: A

Student 7 details:

Name: Cathy

Age: 26  
Midterm1: 85  
Midterm2: 70  
FinalExam: 78  
Total: 233  
Grade: C

Student 8 details:

Name: Paul  
Age: 25  
Midterm1: 89  
Midterm2: 76  
FinalExam: 99  
Total: 264  
Grade: B

Student 9 details:

Name: David  
Age: 24  
Midterm1: 82  
Midterm2: 94  
FinalExam: 87  
Total: 263  
Grade: B

Student 10 details:

Name: Bob  
Age: 23  
Midterm1: 95  
Midterm2: 88  
FinalExam: 78  
Total: 261  
Grade: B

Student 11 details:

Name: Alice  
Age: 22  
Midterm1: 78  
Midterm2: 85  
FinalExam: 92  
Total: 255  
Grade: B

## Sample Output 2:

```
kishore@kishore-virtual-machine:~/Linked_Lists_Ast8$ valgrind --tool=memcheck --leak-check=yes --show-reachable=yes --show-leak-kinds=all --track-origins=yes ./main
```

```
==4814== Memcheck, a memory error detector
==4814== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==4814== Using Valgrind-3.15.0 and LibVEX; rerun with -h for copyright info
==4814== Command: ./main
==4814==
```

Menu:

1. Sort data from file
2. Sort sample data
3. Take 3 user inputs and sort
4. Insert a student to studentsData.txt

Enter choice: 1

Sort data by:

1. Age
2. Grade (A to F)
3. Sort Low to High (F to A, if letter grade is the same, youngest age is at the top)

Enter sorting criteria: 2

Result written to file sortedFileData.txt

Students from File:

Student 1 details

Name: Paul

Age: 25

Midterm1: 89

Midterm2: 76

FinalExam: 99

Total: 264

Grade: B

Student 2 details

Name: Sam

Age: 27

Midterm1: 99

Midterm2: 87

FinalExam: 86

Total: 272

Grade: A

Student 3 details

Name: Alice

Age: 22

Midterm1: 78

Midterm2: 85

FinalExam: 92

Total: 255

Grade: B

Student 4 details

Name: Bob

Age: 23

Midterm1: 95  
Midterm2: 88  
FinalExam: 78  
Total: 261  
Grade: B

Student 5 details  
Name: Cathy  
Age: 26  
Midterm1: 85  
Midterm2: 70  
FinalExam: 78  
Total: 233  
Grade: C

Student 6 details  
Name: David  
Age: 24  
Midterm1: 82  
Midterm2: 94  
FinalExam: 87  
Total: 263  
Grade: B

Student 7 details  
Name: Emily  
Age: 28  
Midterm1: 76  
Midterm2: 65  
FinalExam: 60  
Total: 201  
Grade: F

Student 8 details  
Name: Frank  
Age: 29  
Midterm1: 95  
Midterm2: 91  
FinalExam: 100  
Total: 286  
Grade: A

Student 9 details  
Name: Grace  
Age: 30  
Midterm1: 94  
Midterm2: 78  
FinalExam: 88  
Total: 260



Grade: B

Student 10 details

Name: Hank

Age: 31

Midterm1: 75

Midterm2: 86

FinalExam: 90

Total: 251

Grade: B

Student 11 details

Name: Jonathan

Age: 33

Midterm1: 98

Midterm2: 67

FinalExam: 100

Total: 265

Grade: B

Students from Sample:

Student 12 details

Name: Lisa

Age: 21

Midterm1: 88

Midterm2: 99

FinalExam: 77

Total: 264

Grade: B

Student 13 details

Name: Kyle

Age: 32

Midterm1: 78

Midterm2: 76

FinalExam: 75

Total: 229

Grade: C

Student 14 details

Name: Andy

Age: 25

Midterm1: 92

Midterm2: 88

FinalExam: 95

Total: 275

Grade: A

Student 15 details

Name: Jason  
Age: 28  
Midterm1: 65  
Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

Student 16 details

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82  
Total: 247  
Grade: B

```
==4814==  
==4814== HEAP SUMMARY:  
==4814==    in use at exit: 0 bytes in 0 blocks  
==4814== total heap usage: 30 allocs, 30 frees, 102,016 bytes allocated  
==4814==  
==4814== All heap blocks were freed -- no leaks are possible  
==4814==  
==4814== For lists of detected and suppressed errors, rerun with: -s  
==4814== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

kishore@kishore-virtual-machine:/Linked\_Lists\_Ast8\$ cat sortedFileData.txt

Student 1 details:

Name: Sam  
Age: 27  
Midterm1: 99  
Midterm2: 87  
FinalExam: 86  
Total: 272  
Grade: A

Student 2 details:

Name: Frank  
Age: 29  
Midterm1: 95  
Midterm2: 91  
FinalExam: 100  
Total: 286  
Grade: A

Student 3 details:

Name: Paul  
Age: 25

Midterm1: 89  
Midterm2: 76  
FinalExam: 99  
Total: 264  
Grade: B

Student 4 details:

Name: Alice  
Age: 22  
Midterm1: 78  
Midterm2: 85  
FinalExam: 92  
Total: 255  
Grade: B

Student 5 details:

Name: Bob  
Age: 23  
Midterm1: 95  
Midterm2: 88  
FinalExam: 78  
Total: 261  
Grade: B

Student 6 details:

Name: David  
Age: 24  
Midterm1: 82  
Midterm2: 94  
FinalExam: 87  
Total: 263  
Grade: B

Student 7 details:

Name: Grace  
Age: 30  
Midterm1: 94  
Midterm2: 78  
FinalExam: 88  
Total: 260  
Grade: B

Student 8 details:

Name: Hank  
Age: 31  
Midterm1: 75  
Midterm2: 86  
FinalExam: 90  
Total: 251

Grade: B

Student 9 details:

Name: Jonathan

Age: 33

Midterm1: 98

Midterm2: 67

FinalExam: 100

Total: 265

Grade: B

Student 10 details:

Name: Cathy

Age: 26

Midterm1: 85

Midterm2: 70

FinalExam: 78

Total: 233

Grade: C

Student 11 details:

Name: Emily

Age: 28

Midterm1: 76

Midterm2: 65

FinalExam: 60

Total: 201

Grade: F

### Sample\_output 3

```
kishore@kishore-virtual-machine:/Linked_Lists_Ast8$ valgrind --tool=memcheck --leak-check=yes --show-reachable=yes --show-leak-kinds=all --track-origins=yes ./main
```

```
==4990== Memcheck, a memory error detector
```

```
==4990== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
```

```
==4990== Using Valgrind-3.15.0 and LibVEX; rerun with -h for copyright info
```

```
==4990== Command: ./main
```

```
==4990==
```

Menu:

1. Sort data from file
2. Sort sample data
3. Take 3 user inputs and sort
4. Insert a student to studentsData.txt

Enter choice: 1

Sort data by:

1. Age
2. Grade (A to F)
3. Sort Low to High (F to A, if letter grade is the same, youngest age is at the top)

Enter sorting criteria: 3

Result written to file sortedFileData.txt

Students from File:

Student 1 details

Name: Paul

Age: 25

Midterm1: 89

Midterm2: 76

FinalExam: 99

Total: 264

Grade: B

Student 2 details

Name: Sam

Age: 27

Midterm1: 99

Midterm2: 87

FinalExam: 86

Total: 272

Grade: A

Student 3 details

Name: Alice

Age: 22

Midterm1: 78

Midterm2: 85

FinalExam: 92

Total: 255

Grade: B

Student 4 details

Name: Bob

Age: 23

Midterm1: 95

Midterm2: 88

FinalExam: 78

Total: 261

Grade: B

Student 5 details

Name: Cathy

Age: 26

Midterm1: 85

Midterm2: 70

FinalExam: 78

Total: 233

Grade: C

Student 6 details

Name: David  
Age: 24  
Midterm1: 82  
Midterm2: 94  
FinalExam: 87  
Total: 263  
Grade: B

Student 7 details

Name: Emily  
Age: 28  
Midterm1: 76  
Midterm2: 65  
FinalExam: 60  
Total: 201  
Grade: F

Student 8 details

Name: Frank  
Age: 29  
Midterm1: 95  
Midterm2: 91  
FinalExam: 100  
Total: 286  
Grade: A

Student 9 details

Name: Grace  
Age: 30  
Midterm1: 94  
Midterm2: 78  
FinalExam: 88  
Total: 260  
Grade: B

Student 10 details

Name: Hank  
Age: 31  
Midterm1: 75  
Midterm2: 86  
FinalExam: 90  
Total: 251  
Grade: B

Student 11 details

Name: Jonathan  
Age: 33  
Midterm1: 98  
Midterm2: 67

FinalExam: 100  
Total: 265  
Grade: B

Students from Sample:

Student 12 details

Name: Lisa  
Age: 21  
Midterm1: 88  
Midterm2: 99  
FinalExam: 77  
Total: 264  
Grade: B

Student 13 details

Name: Kyle  
Age: 32  
Midterm1: 78  
Midterm2: 76  
FinalExam: 75  
Total: 229  
Grade: C

Student 14 details

Name: Andy  
Age: 25  
Midterm1: 92  
Midterm2: 88  
FinalExam: 95  
Total: 275  
Grade: A

Student 15 details

Name: Jason  
Age: 28  
Midterm1: 65  
Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

Student 16 details

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82  
Total: 247  
Grade: B

```
==4990==
==4990== HEAP SUMMARY:
==4990==    in use at exit: 0 bytes in 0 blocks
==4990==   total heap usage: 30 allocs, 30 frees, 102,016 bytes allocated
==4990==
==4990== All heap blocks were freed -- no leaks are possible
==4990==
==4990== For lists of detected and suppressed errors, rerun with: -s
==4990== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

kishore@kishore-virtual-machine:/Linked\_Lists\_Ast8\$ cat sortedFileData.txt

Student 1 details:

Name: Emily

Age: 28

Midterm1: 76

Midterm2: 65

FinalExam: 60

Total: 201

Grade: F

Student 2 details:

Name: Cathy

Age: 26

Midterm1: 85

Midterm2: 70

FinalExam: 78

Total: 233

Grade: C

Student 3 details:

Name: Alice

Age: 22

Midterm1: 78

Midterm2: 85

FinalExam: 92

Total: 255

Grade: B

Student 4 details:

Name: Bob

Age: 23

Midterm1: 95

Midterm2: 88

FinalExam: 78

Total: 261

Grade: B

Student 5 details:



Name: David  
Age: 24  
Midterm1: 82  
Midterm2: 94  
FinalExam: 87  
Total: 263  
Grade: B

Student 6 details:

Name: Paul  
Age: 25  
Midterm1: 89  
Midterm2: 76  
FinalExam: 99  
Total: 264  
Grade: B

Student 7 details:

Name: Grace  
Age: 30  
Midterm1: 94  
Midterm2: 78  
FinalExam: 88  
Total: 260  
Grade: B

Student 8 details:

Name: Hank  
Age: 31  
Midterm1: 75  
Midterm2: 86  
FinalExam: 90  
Total: 251  
Grade: B

Student 9 details:

Name: Jonathan  
Age: 33  
Midterm1: 98  
Midterm2: 67  
FinalExam: 100  
Total: 265  
Grade: B

Student 10 details:

Name: Sam  
Age: 27  
Midterm1: 99  
Midterm2: 87

FinalExam: 86  
Total: 272  
Grade: A

Student 11 details:

Name: Frank  
Age: 29  
Midterm1: 95  
Midterm2: 91  
FinalExam: 100  
Total: 286  
Grade: A

#### **Sample\_Output 4:**

```
kishore@kishore-virtual-machine:/Linked_Lists_Ast8$ valgrind --tool=memcheck --leak-check=yes --  
show-reachable=yes --show-leak-kinds=all --track-origins=yes ./main  
==5013== Memcheck, a memory error detector  
==5013== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.  
==5013== Using Valgrind-3.15.0 and LibVEX; rerun with -h for copyright info  
==5013== Command: ./main  
==5013==
```

Menu:

1. Sort data from file
2. Sort sample data
3. Take 3 user inputs and sort
4. Insert a student to studentsData.txt

Enter choice: 2

Sort data by:

1. Age
2. Grade (A to F)
3. Sort Low to High (F to A, if letter grade is the same, youngest age is at the top)

Enter sorting criteria: 1

Result written to file sortedSampleData.txt

Students from File:

Student 1 details

Name: Paul  
Age: 25  
Midterm1: 89  
Midterm2: 76  
FinalExam: 99  
Total: 264  
Grade: B

Student 2 details

Name: Sam  
Age: 27  
Midterm1: 99

Midterm2: 87  
FinalExam: 86  
Total: 272  
Grade: A

Student 3 details

Name: Alice  
Age: 22  
Midterm1: 78  
Midterm2: 85  
FinalExam: 92  
Total: 255  
Grade: B

Student 4 details

Name: Bob  
Age: 23  
Midterm1: 95  
Midterm2: 88  
FinalExam: 78  
Total: 261  
Grade: B

Student 5 details

Name: Cathy  
Age: 26  
Midterm1: 85  
Midterm2: 70  
FinalExam: 78  
Total: 233  
Grade: C

Student 6 details

Name: David  
Age: 24  
Midterm1: 82  
Midterm2: 94  
FinalExam: 87  
Total: 263  
Grade: B

Student 7 details

Name: Emily  
Age: 28  
Midterm1: 76  
Midterm2: 65  
FinalExam: 60  
Total: 201  
Grade: F

Student 8 details

Name: Frank  
Age: 29  
Midterm1: 95  
Midterm2: 91  
FinalExam: 100  
Total: 286  
Grade: A

Student 9 details

Name: Grace  
Age: 30  
Midterm1: 94  
Midterm2: 78  
FinalExam: 88  
Total: 260  
Grade: B

Student 10 details

Name: Hank  
Age: 31  
Midterm1: 75  
Midterm2: 86  
FinalExam: 90  
Total: 251  
Grade: B

Student 11 details

Name: Jonathan  
Age: 33  
Midterm1: 98  
Midterm2: 67  
FinalExam: 100  
Total: 265  
Grade: B

Students from Sample:

Student 12 details

Name: Lisa  
Age: 21  
Midterm1: 88  
Midterm2: 99  
FinalExam: 77  
Total: 264  
Grade: B

Student 13 details

Name: Kyle

Age: 32  
Midterm1: 78  
Midterm2: 76  
FinalExam: 75  
Total: 229  
Grade: C

Student 14 details

Name: Andy  
Age: 25  
Midterm1: 92  
Midterm2: 88  
FinalExam: 95  
Total: 275  
Grade: A

Student 15 details

Name: Jason  
Age: 28  
Midterm1: 65  
Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

Student 16 details

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82  
Total: 247  
Grade: B

```
==5013==  
==5013== HEAP SUMMARY:  
==5013==    in use at exit: 0 bytes in 0 blocks  
==5013== total heap usage: 29 allocs, 29 frees, 101,888 bytes allocated  
==5013==  
==5013== All heap blocks were freed -- no leaks are possible  
==5013==  
==5013== For lists of detected and suppressed errors, rerun with: -s  
==5013== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

kishore@kishore-virtual-machine:/Linked\_Lists\_Ast8\$ cat sortedSampleData.txt

Student 1 details:

Name: Kyle  
Age: 32  
Midterm1: 78

Midterm2: 76  
FinalExam: 75  
Total: 229  
Grade: C

Student 2 details:

Name: Jason  
Age: 28  
Midterm1: 65  
Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

Student 3 details:

Name: Andy  
Age: 25  
Midterm1: 92  
Midterm2: 88  
FinalExam: 95  
Total: 275  
Grade: A

Student 4 details:

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82  
Total: 247  
Grade: B

Student 5 details:

Name: Lisa  
Age: 21  
Midterm1: 88  
Midterm2: 99  
FinalExam: 77  
Total: 264  
Grade: B

**Sample\_Output 5:**

```
kishore@kishore-virtual-machine:/Linked_Lists_Ast8$ valgrind --tool=memcheck --leak-check=yes --
show-reachable=yes --show-leak-kinds=all --track-origins=yes ./main
==5026== Memcheck, a memory error detector
==5026== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==5026== Using Valgrind-3.15.0 and LibVEX; rerun with -h for copyright info
```

==5026== Command: ./main

==5026==

Menu:

1. Sort data from file
2. Sort sample data
3. Take 3 user inputs and sort
4. Insert a student to studentsData.txt

Enter choice: 2

Sort data by:

1. Age
2. Grade (A to F)
3. Sort Low to High (F to A, if letter grade is the same, youngest age is at the top)

Enter sorting criteria: 2

Result written to file sortedSampleData.txt

Students from File:

Student 1 details

Name: Paul

Age: 25

Midterm1: 89

Midterm2: 76

FinalExam: 99

Total: 264

Grade: B

Student 2 details

Name: Sam

Age: 27

Midterm1: 99

Midterm2: 87

FinalExam: 86

Total: 272

Grade: A

Student 3 details

Name: Alice

Age: 22

Midterm1: 78

Midterm2: 85

FinalExam: 92

Total: 255

Grade: B

Student 4 details

Name: Bob

Age: 23

Midterm1: 95

Midterm2: 88

FinalExam: 78

Total: 261  
Grade: B

Student 5 details

Name: Cathy  
Age: 26  
Midterm1: 85  
Midterm2: 70  
FinalExam: 78  
Total: 233  
Grade: C

Student 6 details

Name: David  
Age: 24  
Midterm1: 82  
Midterm2: 94  
FinalExam: 87  
Total: 263  
Grade: B

Student 7 details

Name: Emily  
Age: 28  
Midterm1: 76  
Midterm2: 65  
FinalExam: 60  
Total: 201  
Grade: F

Student 8 details

Name: Frank  
Age: 29  
Midterm1: 95  
Midterm2: 91  
FinalExam: 100  
Total: 286  
Grade: A

Student 9 details

Name: Grace  
Age: 30  
Midterm1: 94  
Midterm2: 78  
FinalExam: 88  
Total: 260  
Grade: B

Student 10 details



Name: Hank  
Age: 31  
Midterm1: 75  
Midterm2: 86  
FinalExam: 90  
Total: 251  
Grade: B

Student 11 details

Name: Jonathan  
Age: 33  
Midterm1: 98  
Midterm2: 67  
FinalExam: 100  
Total: 265  
Grade: B

Students from Sample:

Student 12 details

Name: Lisa  
Age: 21  
Midterm1: 88  
Midterm2: 99  
FinalExam: 77  
Total: 264  
Grade: B

Student 13 details

Name: Kyle  
Age: 32  
Midterm1: 78  
Midterm2: 76  
FinalExam: 75  
Total: 229  
Grade: C

Student 14 details

Name: Andy  
Age: 25  
Midterm1: 92  
Midterm2: 88  
FinalExam: 95  
Total: 275  
Grade: A

Student 15 details

Name: Jason  
Age: 28  
Midterm1: 65

Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

Student 16 details

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82  
Total: 247  
Grade: B

```
==5026==  
==5026== HEAP SUMMARY:  
==5026==    in use at exit: 0 bytes in 0 blocks  
==5026== total heap usage: 29 allocs, 29 frees, 101,888 bytes allocated  
==5026==  
==5026== All heap blocks were freed -- no leaks are possible  
==5026==  
==5026== For lists of detected and suppressed errors, rerun with: -s  
==5026== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

kishore@kishore-virtual-machine:/Linked\_Lists\_Ast8\$ cat sortedSampleData.txt

Student 1 details:

Name: Andy  
Age: 25  
Midterm1: 92  
Midterm2: 88  
FinalExam: 95  
Total: 275  
Grade: A

Student 2 details:

Name: Lisa  
Age: 21  
Midterm1: 88  
Midterm2: 99  
FinalExam: 77  
Total: 264  
Grade: B

Student 3 details:

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82

Total: 247  
Grade: B

Student 4 details:

Name: Kyle  
Age: 32  
Midterm1: 78  
Midterm2: 76  
FinalExam: 75  
Total: 229  
Grade: C

Student 5 details:

Name: Jason  
Age: 28  
Midterm1: 65  
Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

**Sample\_Output 6:**

```
kishore@kishore-virtual-machine:/Linked_Lists_Ast8$ valgrind --tool=memcheck --leak-check=yes --  
show-reachable=yes --show-leak-kinds=all --track-origins=yes ./main  
==5039== Memcheck, a memory error detector  
==5039== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.  
==5039== Using Valgrind-3.15.0 and LibVEX; rerun with -h for copyright info  
==5039== Command: ./main  
==5039==
```

Menu:

1. Sort data from file
2. Sort sample data
3. Take 3 user inputs and sort
4. Insert a student to studentsData.txt

Enter choice: 2

Sort data by:

1. Age
2. Grade (A to F)
3. Sort Low to High (F to A, if letter grade is the same, youngest age is at the top)

Enter sorting criteria: 3

Result written to file sortedSampleData.txt

Students from File:

Student 1 details

Name: Paul  
Age: 25  
Midterm1: 89  
Midterm2: 76

FinalExam: 99  
Total: 264  
Grade: B

Student 2 details

Name: Sam  
Age: 27  
Midterm1: 99  
Midterm2: 87  
FinalExam: 86  
Total: 272  
Grade: A

Student 3 details

Name: Alice  
Age: 22  
Midterm1: 78  
Midterm2: 85  
FinalExam: 92  
Total: 255  
Grade: B

Student 4 details

Name: Bob  
Age: 23  
Midterm1: 95  
Midterm2: 88  
FinalExam: 78  
Total: 261  
Grade: B

Student 5 details

Name: Cathy  
Age: 26  
Midterm1: 85  
Midterm2: 70  
FinalExam: 78  
Total: 233  
Grade: C

Student 6 details

Name: David  
Age: 24  
Midterm1: 82  
Midterm2: 94  
FinalExam: 87  
Total: 263  
Grade: B

Student 7 details

Name: Emily

Age: 28

Midterm1: 76

Midterm2: 65

FinalExam: 60

Total: 201

Grade: F

Student 8 details

Name: Frank

Age: 29

Midterm1: 95

Midterm2: 91

FinalExam: 100

Total: 286

Grade: A

Student 9 details

Name: Grace

Age: 30

Midterm1: 94

Midterm2: 78

FinalExam: 88

Total: 260

Grade: B

Student 10 details

Name: Hank

Age: 31

Midterm1: 75

Midterm2: 86

FinalExam: 90

Total: 251

Grade: B

Student 11 details

Name: Jonathan

Age: 33

Midterm1: 98

Midterm2: 67

FinalExam: 100

Total: 265

Grade: B

Students from Sample:

Student 12 details

Name: Lisa

Age: 21

Midterm1: 88  
Midterm2: 99  
FinalExam: 77  
Total: 264  
Grade: B

Student 13 details

Name: Kyle  
Age: 32  
Midterm1: 78  
Midterm2: 76  
FinalExam: 75  
Total: 229  
Grade: C

Student 14 details

Name: Andy  
Age: 25  
Midterm1: 92  
Midterm2: 88  
FinalExam: 95  
Total: 275  
Grade: A

Student 15 details

Name: Jason  
Age: 28  
Midterm1: 65  
Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

Student 16 details

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82  
Total: 247  
Grade: B

==5039==

==5039== HEAP SUMMARY:

==5039== in use at exit: 0 bytes in 0 blocks

==5039== total heap usage: 29 allocs, 29 frees, 101,888 bytes allocated

==5039==

==5039== All heap blocks were freed -- no leaks are possible

==5039==

==5039== For lists of detected and suppressed errors, rerun with: -s  
==5039== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)

kishore@kishore-virtual-machine:/Linked\_Lists\_Ast8\$ cat sortedSampleData.txt

Student 1 details:

Name: Jason  
Age: 28  
Midterm1: 65  
Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

Student 2 details:

Name: Kyle  
Age: 32  
Midterm1: 78  
Midterm2: 76  
FinalExam: 75  
Total: 229  
Grade: C

Student 3 details:

Name: Lisa  
Age: 21  
Midterm1: 88  
Midterm2: 99  
FinalExam: 77  
Total: 264  
Grade: B

Student 4 details:

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82  
Total: 247  
Grade: B

Student 5 details:

Name: Andy  
Age: 25  
Midterm1: 92  
Midterm2: 88  
FinalExam: 95  
Total: 275

Grade: A

### Sample\_Output 7:

```
kishore@kishore-virtual-machine:/mnt/hgfs/VM-files/Linked_Lists_Ast/CPlusProject_Revised$  
valgrind --tool=memcheck --leak-check=yes --show-reachable=yes --show-leak-kinds=all --track-origins=yes ./main
```

```
==5053== Memcheck, a memory error detector
```

```
==5053== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
```

```
==5053== Using Valgrind-3.15.0 and LibVEX; rerun with -h for copyright info
```

```
==5053== Command: ./main
```

```
==5053==
```

Menu:

1. Sort data from file
2. Sort sample data
3. Take 3 user inputs and sort
4. Insert a student to studentsData.txt

Enter choice: 3

Enter Student 1 details

Enter name (stdName): Linda

Enter age (ag): 33

Enter Midterm1(m1): 98

Enter Midterm2(m2): 97

Enter finalExam(fExam): 100

Enter Student 2 details

Enter name (stdName): John

Enter age (ag): 30

Enter Midterm1(m1): 25

Enter Midterm2(m2): 50

Enter finalExam(fExam): 45

Enter Student 3 details

Enter name (stdName): Tom

Enter age (ag): 25

Enter Midterm1(m1): 75

Enter Midterm2(m2): 85

Enter finalExam(fExam): 89

Sort data by:

1. Age
2. Grade (A to F)
3. Sort Low to High (F to A, if letter grade is the same, youngest age is at the top)

Enter sorting criteria: 1

Result written to file sortedSampleData.txt

Students from File:

Student 1 details

Name: Paul

Age: 25



Midterm1: 89  
Midterm2: 76  
FinalExam: 99  
Total: 264  
Grade: B

Student 2 details

Name: Sam  
Age: 27  
Midterm1: 99  
Midterm2: 87  
FinalExam: 86  
Total: 272  
Grade: A

Student 3 details

Name: Alice  
Age: 22  
Midterm1: 78  
Midterm2: 85  
FinalExam: 92  
Total: 255  
Grade: B

Student 4 details

Name: Bob  
Age: 23  
Midterm1: 95  
Midterm2: 88  
FinalExam: 78  
Total: 261  
Grade: B

Student 5 details

Name: Cathy  
Age: 26  
Midterm1: 85  
Midterm2: 70  
FinalExam: 78  
Total: 233  
Grade: C

Student 6 details

Name: David  
Age: 24  
Midterm1: 82  
Midterm2: 94  
FinalExam: 87  
Total: 263

Grade: B

Student 7 details

Name: Emily

Age: 28

Midterm1: 76

Midterm2: 65

FinalExam: 60

Total: 201

Grade: F

Student 8 details

Name: Frank

Age: 29

Midterm1: 95

Midterm2: 91

FinalExam: 100

Total: 286

Grade: A

Student 9 details

Name: Grace

Age: 30

Midterm1: 94

Midterm2: 78

FinalExam: 88

Total: 260

Grade: B

Student 10 details

Name: Hank

Age: 31

Midterm1: 75

Midterm2: 86

FinalExam: 90

Total: 251

Grade: B

Student 11 details

Name: Jonathan

Age: 33

Midterm1: 98

Midterm2: 67

FinalExam: 100

Total: 265

Grade: B

Students from Sample:

Student 12 details

Name: Lisa  
Age: 21  
Midterm1: 88  
Midterm2: 99  
FinalExam: 77  
Total: 264  
Grade: B

Student 13 details

Name: Kyle  
Age: 32  
Midterm1: 78  
Midterm2: 76  
FinalExam: 75  
Total: 229  
Grade: C

Student 14 details

Name: Andy  
Age: 25  
Midterm1: 92  
Midterm2: 88  
FinalExam: 95  
Total: 275  
Grade: A

Student 15 details

Name: Jason  
Age: 28  
Midterm1: 65  
Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

Student 16 details

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82  
Total: 247  
Grade: B

Student 17 details

Name: Linda  
Age: 33  
Midterm1: 98  
Midterm2: 97

FinalExam: 100  
Total: 295  
Grade: A

Student 18 details

Name: John  
Age: 30  
Midterm1: 25  
Midterm2: 50  
FinalExam: 45  
Total: 120  
Grade: F

Student 19 details

Name: Tom  
Age: 25  
Midterm1: 75  
Midterm2: 85  
FinalExam: 89  
Total: 249  
Grade: B

```
==5053==  
==5053== HEAP SUMMARY:  
==5053==    in use at exit: 0 bytes in 0 blocks  
==5053==   total heap usage: 32 allocs, 32 frees, 102,080 bytes allocated  
==5053==  
==5053== All heap blocks were freed -- no leaks are possible  
==5053==  
==5053== For lists of detected and suppressed errors, rerun with: -s  
==5053== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

kishore@kishore-virtual-machine:/Linked\_Lists\_Ast8\$ cat sortedSampleData.txt

Student 1 details:

Name: Linda  
Age: 33  
Midterm1: 98  
Midterm2: 97  
FinalExam: 100  
Total: 295  
Grade: A

Student 2 details:

Name: Kyle  
Age: 32  
Midterm1: 78  
Midterm2: 76  
FinalExam: 75

Total: 229  
Grade: C

Student 3 details:

Name: John  
Age: 30  
Midterm1: 25  
Midterm2: 50  
FinalExam: 45  
Total: 120  
Grade: F

Student 4 details:

Name: Jason  
Age: 28  
Midterm1: 65  
Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

Student 5 details:

Name: Andy  
Age: 25  
Midterm1: 92  
Midterm2: 88  
FinalExam: 95  
Total: 275  
Grade: A

Student 6 details:

Name: Tom  
Age: 25  
Midterm1: 75  
Midterm2: 85  
FinalExam: 89  
Total: 249  
Grade: B

Student 7 details:

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82  
Total: 247  
Grade: B

Student 8 details:

Name: Lisa  
Age: 21  
Midterm1: 88  
Midterm2: 99  
FinalExam: 77  
Total: 264  
Grade: B

### Sample\_Output 8:

```
kishore@kishore-virtual-machine:/Linked_Lists_Ast8$ valgrind --tool=memcheck --leak-check=yes --  
show-reachable=yes --show-leak-kinds=all --track-origins=yes ./main  
==5070== Memcheck, a memory error detector  
==5070== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.  
==5070== Using Valgrind-3.15.0 and LibVEX; rerun with -h for copyright info  
==5070== Command: ./main  
==5070==
```

Menu:

1. Sort data from file
2. Sort sample data
3. Take 3 user inputs and sort
4. Insert a student to studentsData.txt

Enter choice: 3

Enter Student 1 details

Enter name (stdName): Linda

Enter age (ag): 33

Enter Midterm1(m1): 98

Enter Midterm2(m2): 97

Enter finalExam(fExam): 100

Enter Student 2 details

Enter name (stdName): John

Enter age (ag): 30

Enter Midterm1(m1): 25

Enter Midterm2(m2): 50

Enter finalExam(fExam): 45

Enter Student 3 details

Enter name (stdName): Tom

Enter age (ag): 25

Enter Midterm1(m1): 75

Enter Midterm2(m2): 85

Enter finalExam(fExam): 89

Sort data by:

1. Age
2. Grade (A to F)
3. Sort Low to High (F to A, if letter grade is the same, youngest age is at the top)

Enter sorting criteria: 2

Result written to file sortedSampleData.txt

Students from File:

Student 1 details

Name: Paul

Age: 25

Midterm1: 89

Midterm2: 76

FinalExam: 99

Total: 264

Grade: B

Student 2 details

Name: Sam

Age: 27

Midterm1: 99

Midterm2: 87

FinalExam: 86

Total: 272

Grade: A

Student 3 details

Name: Alice

Age: 22

Midterm1: 78

Midterm2: 85

FinalExam: 92

Total: 255

Grade: B

Student 4 details

Name: Bob

Age: 23

Midterm1: 95

Midterm2: 88

FinalExam: 78

Total: 261

Grade: B

Student 5 details

Name: Cathy

Age: 26

Midterm1: 85

Midterm2: 70

FinalExam: 78

Total: 233

Grade: C

Student 6 details

Name: David

Age: 24

Midterm1: 82

Midterm2: 94  
FinalExam: 87  
Total: 263  
Grade: B

Student 7 details

Name: Emily  
Age: 28  
Midterm1: 76  
Midterm2: 65  
FinalExam: 60  
Total: 201  
Grade: F

Student 8 details

Name: Frank  
Age: 29  
Midterm1: 95  
Midterm2: 91  
FinalExam: 100  
Total: 286  
Grade: A

Student 9 details

Name: Grace  
Age: 30  
Midterm1: 94  
Midterm2: 78  
FinalExam: 88  
Total: 260  
Grade: B

Student 10 details

Name: Hank  
Age: 31  
Midterm1: 75  
Midterm2: 86  
FinalExam: 90  
Total: 251  
Grade: B

Student 11 details

Name: Jonathan  
Age: 33  
Midterm1: 98  
Midterm2: 67  
FinalExam: 100  
Total: 265  
Grade: B



Students from Sample:

Student 12 details

Name: Lisa

Age: 21

Midterm1: 88

Midterm2: 99

FinalExam: 77

Total: 264

Grade: B

Student 13 details

Name: Kyle

Age: 32

Midterm1: 78

Midterm2: 76

FinalExam: 75

Total: 229

Grade: C

Student 14 details

Name: Andy

Age: 25

Midterm1: 92

Midterm2: 88

FinalExam: 95

Total: 275

Grade: A

Student 15 details

Name: Jason

Age: 28

Midterm1: 65

Midterm2: 70

FinalExam: 68

Total: 203

Grade: F

Student 16 details

Name: Sarah

Age: 22

Midterm1: 80

Midterm2: 85

FinalExam: 82

Total: 247

Grade: B

Student 17 details

Name: Linda

Age: 33  
Midterm1: 98  
Midterm2: 97  
FinalExam: 100  
Total: 295  
Grade: A

Student 18 details

Name: John  
Age: 30  
Midterm1: 25  
Midterm2: 50  
FinalExam: 45  
Total: 120  
Grade: F

Student 19 details

Name: Tom  
Age: 25  
Midterm1: 75  
Midterm2: 85  
FinalExam: 89  
Total: 249  
Grade: B

```
==5070==  
==5070== HEAP SUMMARY:  
==5070==    in use at exit: 0 bytes in 0 blocks  
==5070==   total heap usage: 32 allocs, 32 frees, 102,080 bytes allocated  
==5070==  
==5070== All heap blocks were freed -- no leaks are possible  
==5070==  
==5070== For lists of detected and suppressed errors, rerun with: -s  
==5070== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

kishore@kishore-virtual-machine:/Linked\_Lists\_Ast8\$ cat sortedSampleData.txt

Student 1 details:

Name: Andy  
Age: 25  
Midterm1: 92  
Midterm2: 88  
FinalExam: 95  
Total: 275  
Grade: A

Student 2 details:

Name: Linda  
Age: 33  
Midterm1: 98

Midterm2: 97  
FinalExam: 100  
Total: 295  
Grade: A

Student 3 details:

Name: Lisa  
Age: 21  
Midterm1: 88  
Midterm2: 99  
FinalExam: 77  
Total: 264  
Grade: B

Student 4 details:

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82  
Total: 247  
Grade: B

Student 5 details:

Name: Tom  
Age: 25  
Midterm1: 75  
Midterm2: 85  
FinalExam: 89  
Total: 249  
Grade: B

Student 6 details:

Name: Kyle  
Age: 32  
Midterm1: 78  
Midterm2: 76  
FinalExam: 75  
Total: 229  
Grade: C

Student 7 details:

Name: Jason  
Age: 28  
Midterm1: 65  
Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

Student 8 details:

Name: John

Age: 30

Midterm1: 25

Midterm2: 50

FinalExam: 45

Total: 120

Grade: F

### Sample\_Output 9:

```
kishore@kishore-virtual-machine:/Linked_Lists_Ast8$ valgrind --tool=memcheck --leak-check=yes --show-reachable=yes --show-leak-kinds=all --track-origins=yes ./main
```

```
==5080== Memcheck, a memory error detector
```

```
==5080== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
```

```
==5080== Using Valgrind-3.15.0 and LibVEX; rerun with -h for copyright info
```

```
==5080== Command: ./main
```

```
==5080==
```

Menu:

1. Sort data from file
2. Sort sample data
3. Take 3 user inputs and sort
4. Insert a student to studentsData.txt

Enter choice: 3

Enter Student 1 details

Enter name (stdName): Linda

Enter age (ag): 33

Enter Midterm1(m1): 98

Enter Midterm2(m2): 97

Enter finalExam(fExam): 100

Enter Student 2 details

Enter name (stdName): John

Enter age (ag): 30

Enter Midterm1(m1): 25

Enter Midterm2(m2): 50

Enter finalExam(fExam): 45

Enter Student 3 details

Enter name (stdName): Tom

Enter age (ag): 25

Enter Midterm1(m1): 75

Enter Midterm2(m2): 85

Enter finalExam(fExam): 89

Sort data by:

1. Age
2. Grade (A to F)
3. Sort Low to High (F to A, if letter grade is the same, youngest age is at the top)

Enter sorting criteria: 3

Result written to file sortedSampleData.txt

Students from File:

Student 1 details

Name: Paul

Age: 25

Midterm1: 89

Midterm2: 76

FinalExam: 99

Total: 264

Grade: B

Student 2 details

Name: Sam

Age: 27

Midterm1: 99

Midterm2: 87

FinalExam: 86

Total: 272

Grade: A

Student 3 details

Name: Alice

Age: 22

Midterm1: 78

Midterm2: 85

FinalExam: 92

Total: 255

Grade: B

Student 4 details

Name: Bob

Age: 23

Midterm1: 95

Midterm2: 88

FinalExam: 78

Total: 261

Grade: B

Student 5 details

Name: Cathy

Age: 26

Midterm1: 85

Midterm2: 70

FinalExam: 78

Total: 233

Grade: C

Student 6 details

Name: David

Age: 24  
Midterm1: 82  
Midterm2: 94  
FinalExam: 87  
Total: 263  
Grade: B

Student 7 details

Name: Emily  
Age: 28  
Midterm1: 76  
Midterm2: 65  
FinalExam: 60  
Total: 201  
Grade: F

Student 8 details

Name: Frank  
Age: 29  
Midterm1: 95  
Midterm2: 91  
FinalExam: 100  
Total: 286  
Grade: A

Student 9 details

Name: Grace  
Age: 30  
Midterm1: 94  
Midterm2: 78  
FinalExam: 88  
Total: 260  
Grade: B

Student 10 details

Name: Hank  
Age: 31  
Midterm1: 75  
Midterm2: 86  
FinalExam: 90  
Total: 251  
Grade: B

Student 11 details

Name: Jonathan  
Age: 33  
Midterm1: 98  
Midterm2: 67  
FinalExam: 100

Total: 265  
Grade: B

Students from Sample:

Student 12 details

Name: Lisa  
Age: 21  
Midterm1: 88  
Midterm2: 99  
FinalExam: 77  
Total: 264  
Grade: B

Student 13 details

Name: Kyle  
Age: 32  
Midterm1: 78  
Midterm2: 76  
FinalExam: 75  
Total: 229  
Grade: C

Student 14 details

Name: Andy  
Age: 25  
Midterm1: 92  
Midterm2: 88  
FinalExam: 95  
Total: 275  
Grade: A

Student 15 details

Name: Jason  
Age: 28  
Midterm1: 65  
Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

Student 16 details

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82  
Total: 247  
Grade: B

Student 17 details

Name: Linda  
Age: 33  
Midterm1: 98  
Midterm2: 97  
FinalExam: 100  
Total: 295  
Grade: A

Student 18 details

Name: John  
Age: 30  
Midterm1: 25  
Midterm2: 50  
FinalExam: 45  
Total: 120  
Grade: F

Student 19 details

Name: Tom  
Age: 25  
Midterm1: 75  
Midterm2: 85  
FinalExam: 89  
Total: 249  
Grade: B

==5080==

==5080== HEAP SUMMARY:

==5080== in use at exit: 0 bytes in 0 blocks

==5080== total heap usage: 32 allocs, 32 frees, 102,080 bytes allocated

==5080==

==5080== All heap blocks were freed -- no leaks are possible

==5080==

==5080== For lists of detected and suppressed errors, rerun with: -s

==5080== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)

kishore@kishore-virtual-machine:/Linked\_Lists\_Ast8/\$ cat sortedSampleData.txt

Student 1 details:

Name: Jason  
Age: 28  
Midterm1: 65  
Midterm2: 70  
FinalExam: 68  
Total: 203  
Grade: F

Student 2 details:

Name: John



Age: 30  
Midterm1: 25  
Midterm2: 50  
FinalExam: 45  
Total: 120  
Grade: F

Student 3 details:

Name: Kyle  
Age: 32  
Midterm1: 78  
Midterm2: 76  
FinalExam: 75  
Total: 229  
Grade: C

Student 4 details:

Name: Lisa  
Age: 21  
Midterm1: 88  
Midterm2: 99  
FinalExam: 77  
Total: 264  
Grade: B

Student 5 details:

Name: Sarah  
Age: 22  
Midterm1: 80  
Midterm2: 85  
FinalExam: 82  
Total: 247  
Grade: B

Student 6 details:

Name: Tom  
Age: 25  
Midterm1: 75  
Midterm2: 85  
FinalExam: 89  
Total: 249  
Grade: B

Student 7 details:

Name: Andy  
Age: 25  
Midterm1: 92  
Midterm2: 88  
FinalExam: 95

Total: 275  
Grade: A

Student 8 details:

Name: Linda  
Age: 33  
Midterm1: 98  
Midterm2: 97  
FinalExam: 100  
Total: 295  
Grade: A

### Sample\_output 10:

```
kishore@kishore-virtual-machine:/Linked_Lists_Ast8$ valgrind --tool=memcheck --leak-check=yes --
show-reachable=yes --show-leak-kinds=all --track-origins=yes ./main
==5093== Memcheck, a memory error detector
==5093== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==5093== Using Valgrind-3.15.0 and LibVEX; rerun with -h for copyright info
==5093== Command: ./main
==5093==
Menu:
1. Sort data from file
2. Sort sample data
3. Take 3 user inputs and sort
4. Insert a student to studentsData.txt
Enter choice: 4
```

Enter student details:

Name: Simon  
Age: 35  
Midterm1: 100  
Midterm2: 100  
Final Exam: 100

Student details updated to studentsData.txt file!

Students from File:

Student 1 details

Name: Paul  
Age: 25  
Midterm1: 89  
Midterm2: 76  
FinalExam: 99  
Total: 264  
Grade: B

Student 2 details

Name: Sam

Age: 27

Midterm1: 99

Midterm2: 87

FinalExam: 86

Total: 272

Grade: A

Student 3 details

Name: Alice

Age: 22

Midterm1: 78

Midterm2: 85

FinalExam: 92

Total: 255

Grade: B

Student 4 details

Name: Bob

Age: 23

Midterm1: 95

Midterm2: 88

FinalExam: 78

Total: 261

Grade: B

Student 5 details

Name: Cathy

Age: 26

Midterm1: 85

Midterm2: 70

FinalExam: 78

Total: 233

Grade: C

Student 6 details

Name: David

Age: 24

Midterm1: 82

Midterm2: 94

FinalExam: 87

Total: 263

Grade: B

Student 7 details

Name: Emily

Age: 28

Midterm1: 76

Midterm2: 65  
FinalExam: 60  
Total: 201  
Grade: F

Student 8 details

Name: Frank  
Age: 29  
Midterm1: 95  
Midterm2: 91  
FinalExam: 100  
Total: 286  
Grade: A

Student 9 details

Name: Grace  
Age: 30  
Midterm1: 94  
Midterm2: 78  
FinalExam: 88  
Total: 260  
Grade: B

Student 10 details

Name: Hank  
Age: 31  
Midterm1: 75  
Midterm2: 86  
FinalExam: 90  
Total: 251  
Grade: B

Student 11 details

Name: Jonathan  
Age: 33  
Midterm1: 98  
Midterm2: 67  
FinalExam: 100  
Total: 265  
Grade: B

Student 12 details

Name: Simon  
Age: 35  
Midterm1: 100  
Midterm2: 100  
FinalExam: 100  
Total: 300  
Grade: A

Students from Sample:

Student 13 details

Name: Lisa

Age: 21

Midterm1: 88

Midterm2: 99

FinalExam: 77

Total: 264

Grade: B

Student 14 details

Name: Kyle

Age: 32

Midterm1: 78

Midterm2: 76

FinalExam: 75

Total: 229

Grade: C

Student 15 details

Name: Andy

Age: 25

Midterm1: 92

Midterm2: 88

FinalExam: 95

Total: 275

Grade: A

Student 16 details

Name: Jason

Age: 28

Midterm1: 65

Midterm2: 70

FinalExam: 68

Total: 203

Grade: F

Student 17 details

Name: Sarah

Age: 22

Midterm1: 80

Midterm2: 85

FinalExam: 82

Total: 247

Grade: B

==5093==

==5093== HEAP SUMMARY:

```
==5093==   in use at exit: 0 bytes in 0 blocks
==5093==  total heap usage: 26 allocs, 26 frees, 101,832 bytes allocated
==5093==
==5093== All heap blocks were freed -- no leaks are possible
==5093==
==5093== For lists of detected and suppressed errors, rerun with: -s
==5093== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

```
kishore@kishore-virtual-machine:/Linked_Lists_Ast8$ cat studentsData.txt
```

```
Paul 25 89 76 99
Sam 27 99 87 86
Alice 22 78 85 92
Bob 23 95 88 78
Cathy 26 85 70 78
David 24 82 94 87
Emily 28 76 65 60
Frank 29 95 91 100
Grace 30 94 78 88
Hank 31 75 86 90
Jonathan 33 98 67 100
Simon 35 100 100 100
```

```
kishore@kishore-virtual-machine:/Linked_Lists_Ast8$ cat studentsData_OutputFile.txt
```

```
*****
```

```
Student 1:
Name: Paul
Age: 25
Midterm1: 89
Midterm2: 76
FinalExam: 99
Total: 264
Grade: B
```

```
*****
```

```
Student 2:
Name: Sam
Age: 27
Midterm1: 99
Midterm2: 87
FinalExam: 86
Total: 272
Grade: A
```

```
*****
```

```
Student 3:
Name: Alice
Age: 22
Midterm1: 78
Midterm2: 85
```

FinalExam: 92  
Total: 255  
Grade: B

\*\*\*\*\*

Student 4:  
Name: Bob  
Age: 23  
Midterm1: 95  
Midterm2: 88  
FinalExam: 78  
Total: 261  
Grade: B

\*\*\*\*\*

Student 5:  
Name: Cathy  
Age: 26  
Midterm1: 85  
Midterm2: 70  
FinalExam: 78  
Total: 233  
Grade: C

\*\*\*\*\*

Student 6:  
Name: David  
Age: 24  
Midterm1: 82  
Midterm2: 94  
FinalExam: 87  
Total: 263  
Grade: B

\*\*\*\*\*

Student 7:  
Name: Emily  
Age: 28  
Midterm1: 76  
Midterm2: 65  
FinalExam: 60  
Total: 201  
Grade: F

\*\*\*\*\*

Student 8:  
Name: Frank  
Age: 29  
Midterm1: 95

Midterm2: 91  
FinalExam: 100  
Total: 286  
Grade: A

\*\*\*\*\*

Student 9:  
Name: Grace  
Age: 30  
Midterm1: 94  
Midterm2: 78  
FinalExam: 88  
Total: 260  
Grade: B

\*\*\*\*\*

Student 10:  
Name: Hank  
Age: 31  
Midterm1: 75  
Midterm2: 86  
FinalExam: 90  
Total: 251  
Grade: B

\*\*\*\*\*

Student 11:  
Name: Jonathan  
Age: 33  
Midterm1: 98  
Midterm2: 67  
FinalExam: 100  
Total: 265  
Grade: B

\*\*\*\*\*

Student 12:  
Name: Simon  
Age: 35  
Midterm1: 100  
Midterm2: 100  
FinalExam: 100  
Total: 300  
Grade: A