

# Program 507a (MIT or Bust)

The zero robotics team made it in to the finals at a MIT computer programming competition. They get to explore Boston on Thursday. They plan to go to the MIT Museum, home of robotics and artificial intelligence. The cost to get in depends on their age. If they are less than 17 years old, the cost is \$5, others cost \$10 each. The Museum of Science has a “Bed of Nails” for patrons to lay upon, sounds frightful. Online, the cost of tickets is \$25 per person plus \$6 to see up to 2 movies per person, any movies past 2 cost \$4 each. Crafty Mrs Bain called to see if she could get a deal. She discovered that if it was a school group and there were 10 people or more in the group, the cost for each person dropped to \$10 and the teacher was allowed to enter for free. The cost for movies changed to \$4 per person per movie. Teachers could watch the movies for free. She was also informed that if the school had 50% or higher on free-reduced lunch, they would be given a \$50 discount off their total bill.

Write a program that will read in the first and last name (store as one name), the grade the student is in (9-12, 20 indicates a teacher), the students age and the number of movies the student/teacher plans to attend. The program should calculate the cost to go to each museum for each person (stored on their object). When a teacher is detected, the number following it will be either a 0 or a 1 instead of age. Zero indicates that the free and reduced-lunch rate is below 50% and a 1 indicates that it is 50% or higher. The final calculations will be the total cost to attend each museum and a grand total, disregarding tax. The school is tax exempt. You will run the program twice (dat file containing Andy Hermanson, dat file without Andy).

The program should be flexible, meaning that if I change the dat file tomorrow and make it longer or shorter, it should run/calculate correctly without making modifications to the code.

## Program requirements:

- **Input section:** create a class for each student, store each student/teacher in an arrayList. The word “done” indicates the end of the file.
- **Processing section:** mutators (3 minimum, can’t just say setValues() and lump all the math together) The math should occur in the mutators in the class, the totals can be calculated in the client code.
- **Output section:** In the client code, the output will be in a for:each loop. In the class there will be a toString() method that will output an entire object. Lastly, final statements with the totals will be output.

**Required Statements:** external file input, output, loop controls, classes and arrayLists

**Data location:** prog507a.dat

## Sample Output with Andy Hermanson in dat file:

### Rock ‘n’ Robots: MIT or BUST!

Name	Grade	MIT Museum	Museum of Science
Frank Breu	Junior	\$10.00	\$22.00
Grace Clasen	Sophomore	\$5.00	\$14.00
Travis Duffy	Senior	\$10.00	\$18.00
Malcolm Eady	Sophomore	\$5.00	\$22.00
Ben Glowacki	Junior	\$10.00	\$18.00
Andy Hermanson	Junior	\$10.00	\$18.00
Harry Kubiak	Freshman	\$5.00	\$18.00
Alexei Sapozhnikov	Senior	\$10.00	\$14.00
Sophia Werner	Senior	\$10.00	\$22.00
Mrs Bain	Teacher	\$10.00	\$0.00

more ouput on next pg

The total cost to visit the MIT Museum is: \$85.00

The total cost to visit the Museum of Science is: \$116



The grand total is: \$201.00

Take Andy Hermanson out of the dat file and you should get these results:

**Rock 'n' Robots: MIT or BUST!**

Name	Grade	MIT Museum	Museum of Science
Frank Breu	Junior	\$10.00	\$35.00
Grace Clasen	Sophomore	\$5.00	\$31.00
Travis Duffy	Senior	\$10.00	\$31.00
Malcolm Eady	Sophomore	\$5.00	\$35.00
Ben Glowacki	Junior	\$10.00	\$31.00
Harry Kubiak	Freshman	\$5.00	\$31.00
Alexei Sapozhnikov	Senior	\$10.00	\$31.00
Sophia Werner	Senior	\$10.00	\$35.00
Mrs Bain	Teacher	\$10.00	\$35.00

The total cost to visit the MIT Museum is: \$75.00

The total cost to visit the Museum of Science is: \$245.00

The grand total is: \$320.00