

Bicycle Rental Assignment

Bicycles – The World’s Greatest Cost Effective Healthy Green Fashionable Transportation Solution

Downtown Dallas, Texas has seen an explosion in a demand for bicycle rentals. You have decided to go into the bicycle rental business to satisfy the world’s desire for cost effective healthy green transportation. Market studies have shown that hundreds of billions of people are interested in renting bicycles which will result in a huge number of rentals from your bicycle rental store.

You need to develop a program that calculates the rental charge for a bicycle rental based on the number of days the bicycle is rented and the bicycle type.

The program will have a `BicycleRentalClass` with a derived class for each type of bicycle.

The program must create and use at least an amount of bicycle objects for each type of bicycle.

This program introduces using virtual functions with override inheritance by creating subclasses of a `BicycleRentalClass` based on bicycle type. The program uses subclass object pointers to allow dynamic runtime binding of the virtual functions. The program also demonstrates the use of static class members.

The provided code is not to be altered. Only areas that require code development are to be modified by inserting code.

The code development areas will be marked `//$`. These areas will use the provided code to write the necessary code to get the solution to run correctly. Look for this in all files to successfully develop and insert code to make the program work correctly.

The following files are provided in the assignment:

- `BicycleTypes.h`
- `BicycleRentalClass.h`
- `BicycleRentalClass.cpp`
- `BicycleRentalSubClasses.h`
- `BicycleRentalSubClasses.cpp`
- `main.cpp`

The following are the classes provided in the files and must be used in your coding efforts:

- `BicycleRentalClass`
- `BicycleRentalStandardClasses`
- `BicycleRentalRacerClass`
- `BicycleRentalBMXClass`

The implementation of the `BicycleRentalStandardClass` is provided to act as a guide in developing the other classes.

The `main()` is a test driver, a concept that is demonstrated in the book and has been discussed in class, to test the program designed and developed code. The main test driver tests all paths of the logic flow and conditions of the program to validate program correctness. As usual for a test driver `main()`, there are not any interactive prompts in the program.

Make sure that you look at all the files and understand the program class structure to be able to correctly finish the assignment.

The output below has been generated by a correct solution

Bicycle Rental Assignment

Test bike rentals for various days for various bike types

Bike Rental Information

Bike Id : 101
Bicycle Type : Standard
Rental Day(s) : 1
Daily Rental Rate : 1.00
Rental Charge : 1.00

Totals:

Number of Bike Type Rented : 1
Sales Amount Bike Type Rented : 1.00

Total Number of Bikes Rented : 1
Total Sales All Bikes Rented : 1.00

Press the enter key to continue.

Bike Rental Information

Bike Id : 201
Bicycle Type : Racer
Rental Day(s) : 1
Daily Rental Rate : 1.50
Rental Charge : 1.50

Totals:

Number of Bike Type Rented : 1
Sales Amount Bike Type Rented : 1.50

Total Number of Bikes Rented : 2
Total Sales All Bikes Rented : 2.50

Press the enter key to continue.

Bike Rental Information

Bike Id : 301
Bicycle Type : BMX
Rental Day(s) : 1
Daily Rental Rate : 1.89
Rental Charge : 1.89

Totals:

Number of Bike Type Rented : 1
Sales Amount Bike Type Rented : 1.89

Total Number of Bikes Rented : 3
Total Sales All Bikes Rented : 4.39

Press the enter key to continue.

Bike Rental Information

Bike Id : 101
Bicycle Type : Standard
Rental Day(s) : 3
Daily Rental Rate : 1.00
Rental Charge : 3.00

Totals:

Number of Bike Type Rented : 2
Sales Amount Bike Type Rented : 4.00

Total Number of Bikes Rented : 4
Total Sales All Bikes Rented : 7.39

Press the enter key to continue.

Bicycle Rental Assignment

Bike Rental Information

Bike Id : 201
Bicycle Type : Racer
Rental Day(s) : 3
Daily Rental Rate : 1.50
Rental Charge : 4.50

Totals:

Number of Bike Type Rented : 2
Sales Amount Bike Type Rented : 6.00

Total Number of Bikes Rented : 5
Total Sales All Bikes Rented : 11.89

Press the enter key to continue.

Bike Rental Information

Bike Id : 301
Bicycle Type : BMX
Rental Day(s) : 3
Daily Rental Rate : 1.89
Rental Charge : 5.67

Totals:

Number of Bike Type Rented : 2
Sales Amount Bike Type Rented : 7.56

Total Number of Bikes Rented : 6
Total Sales All Bikes Rented : 17.56

Press the enter key to continue.

Bike Rental Information

Bike Id : 101
Bicycle Type : Standard
Rental Day(s) : 5
Daily Rental Rate : 1.00
Rental Charge : 5.00

Totals:

Number of Bike Type Rented : 3
Sales Amount Bike Type Rented : 9.00

Total Number of Bikes Rented : 7
Total Sales All Bikes Rented : 22.56

Press the enter key to continue.

Bike Rental Information

Bike Id : 201
Bicycle Type : Racer
Rental Day(s) : 5
Daily Rental Rate : 1.50
Rental Charge : 7.50

Totals:

Number of Bike Type Rented : 3
Sales Amount Bike Type Rented : 13.50

Total Number of Bikes Rented : 8
Total Sales All Bikes Rented : 30.06

Press the enter key to continue.

Bike Rental Information

Bike Id : 301
Bicycle Type : BMX
Rental Day(s) : 5
Daily Rental Rate : 1.89
Rental Charge : 9.45

Bicycle Rental Assignment

Totals:

Number of Bike Type Rented : 3
Sales Amount Bike Type Rented : 17.01

Total Number of Bikes Rented : 9
Total Sales All Bikes Rented : 39.51

Press the enter key to continue.

Bike Rental Information

Bike Id : 101
Bicycle Type : Standard
Rental Day(s) : 12
Daily Rental Rate : 1.00
Rental Charge : 12.00

Totals:

Number of Bike Type Rented : 4
Sales Amount Bike Type Rented : 21.00

Total Number of Bikes Rented : 10
Total Sales All Bikes Rented : 51.51

Press the enter key to continue.

Bike Rental Information

Bike Id : 201
Bicycle Type : Racer
Rental Day(s) : 12
Daily Rental Rate : 1.50
Rental Charge : 18.00

Totals:

Number of Bike Type Rented : 4
Sales Amount Bike Type Rented : 31.50

Total Number of Bikes Rented : 11
Total Sales All Bikes Rented : 69.51

Press the enter key to continue.

Bike Rental Information

Bike Id : 301
Bicycle Type : BMX
Rental Day(s) : 12
Daily Rental Rate : 1.89
Rental Charge : 22.68

Totals:

Number of Bike Type Rented : 4
Sales Amount Bike Type Rented : 39.69

Total Number of Bikes Rented : 12
Total Sales All Bikes Rented : 92.19

Press the enter key to continue.

Bicycle Id : 101
Bicycle Id Compare : 101
are equal

Bicycle Id : 101
Bicycle Id Compare : 201
are not equal

Press the enter key to continue...