Obstacles during Development

1. I started by working on the cout and cin statements in the beginning of the program that prompt the user for input and save the results to variables, respectively. However, the getline that I used to store the customer’s name into a string caused the program to end prematurely without asking for the rest of the input. I solved this by including a cin.ignore(10000, ‘\n’) statement before the getline.
2. I calculated the rental charge by including statements that handle trips of progressively larger mileage. The program calculates the cost of the first 100 miles of the trip, the next 300 miles, and so on by checking if the mileage is lower than a specified value. However, trips of lower mileage ended up with a calculated charge that was too high because they triggered the statements intended for higher miles. I addressed this issue by setting the mileage on trips to 0 after their charges had been calculated.
3. The program would not add the seasonal charge, so the final charge would always be lower than expected. After reviewing the relevant code section, I discovered that I was storing the seasonal rate per mile in an int instead of a double, truncating the value to 0. Declaring the seasonalRate variable as a double solved this problem.

Test data

The program handles all of the below test cases correctly.

Format: Odometer at start/Odometer at end/Rental days/Customer name/Luxury car/Month

* -50/50/3/Bob Smith/n/4
  + Negative starting odometer reading
* 200/100/7/Bob Smith/y/6
  + End odometer reading less than start
* 300/840/-10/Bob Smith/y/3
  + Negative number of rental days
* 20/60/3/ /n/4
  + No customer name entered
* 75/185/2/Bob Smith/c/8
  + Invalid character for luxury car
* 30/470/3/Bob Smith/y/20
  + Month number not in range 1 through 12
* 100/190/4/Bob Smith/n/1
  + Trip less than 100 miles, winter, basic car
* 100/190/4/Bob Smith/y/1
  + Trip less than 100 miles, winter, luxury car
* 100/190/4/Bob Smith/n/7
  + Trip less than 100 miles, non-winter, basic car
* 100/190/4/Bob Smith/y/7
  + Trip less than 100 miles, non-winter, luxury car
* 500/600/5/Bob Smith/n/1
  + Trip exactly 100 miles, winter, basic car
* 500/600/5/Bob Smith/y/1
  + Trip exactly 100 miles, winter, luxury car
* 500/600/5/Bob Smith/n/7
  + Trip exactly 100 miles, non-winter, basic car
* 500/600/5/Bob Smith/y/7
  + Trip exactly 100 miles, non-winter, luxury car
* 300/600/3/Bob Smith/n/1
  + Trip between 100 and 400 miles, winter, basic car
* 300/600/3/Bob Smith/y/1
  + Trip between 100 and 400 miles, winter, luxury car
* 300/600/3/Bob Smith/n/7
  + Trip between 100 and 400 miles, non-winter, basic car
* 300/600/3/Bob Smith/y/7
  + Trip between 100 and 400 miles, non-winter, luxury car
* 400/800/3/Bob Smith/n/1
  + Trip exactly 400 miles, winter, basic car
* 400/800/3/Bob Smith/y/1
  + Trip exactly 400 miles, winter, luxury car
* 400/800/3/Bob Smith/n/7
  + Trip exactly 400 miles, non-winter, basic car
* 400/800/3/Bob Smith/y/7
  + Trip exactly 400 miles, non-winter, luxury car
* 500/1100/6/Bob Smith/n/1
  + Trip greater than 400 miles, winter, basic car
* 500/1100/6/Bob Smith/y/1
  + Trip greater than 400 miles, winter, luxury car
* 500/1100/6/Bob Smith/n/7
  + Trip greater than 400 miles, non-winter, basic car
* 500/1100/6/Bob Smith/y/7
  + Trip greater than 400 miles, non-winter, luxury car