





دانشکده مهندسی برق

(توضیح بخش نرم افزار)

عنوان:

پیش بینی قیمت خودرو

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نام نگارنده: ارشیا گشتاسبی

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صورت مسئله:

از کاربر، مدل و سازنده‌ی یک خودرو را دریافت کند و خودروهایی با این ویژگی را از سایت TrueCar.com دریافت کند. سپس طبق ویژگی‌های خودروی کاربر – مایل حرکت کرده، تعداد تصادفات، تعداد صاحبان و نوع کاربری – قیمتی را برای خودرو طبق الگوریتم رگرسیون خطی پیش‌بینی کند.

راه حل:

ابتدا داده‌ها را با استفاده از کتابخانه requests دریافت کرده. سپس با استفاده از کتابخانه BeautifulSoup، کدهای صفحات وب را به صورت مناسب در آورده می‌شوند. با کمک کتابخانه sklearn مدل رگرسیون خطی بدست آورده می‌شود. در انتها با توجه به داده‌های کاربر عددی پیش‌بینی می‌شود.

بررسی کد:

```
def delete_b(st):
    n=len(st)
    st1=""
    for i in range(0,n):
        if st[i]==' ':
            pass
        else:
            st1+=st[i]
    return st1
```

این تابع، کاراکتر " " از داده‌ها حذف می‌کند.

```
from bs4 import BeautifulSoup
import requests
```

وارد کردن دو کتابخانه BeautifulSoup و requests در جهت داده‌خوانی از صفحات وب.

```
print("Name of the car:")
print("Make = ",end="")
name_make=input()
print("Model = ",end="")
name_model=input()
```

گرفتن ورودی‌ها:

در خط اول شرکت سازنده خودرو و در خط بعدی، مدل خودرو دریافت می‌شود.

```
sites=[]
price=[]
mile=[]
accident=[]
owner=[]
use=[]
```

تعریف لیست‌هایی که در آن داده‌ها را به ترتیب ذخیره می‌شود.

```
for j in range(1,6):
    site_c="https://www.truecar.com/used-cars-for-
sale/listings/"+name_make+"/"+name_model+"/?/page="+str(j)
    sites.append(site_c)
```

ساختن آدرس صفحات وبی که داده‌ها در آن موجود اند و اضافه کردن این آدرس‌ها در لیست سایت‌ها.

```
for site in sites:
    r=requests.get(site)
    t=r.text
```

```

soup=BeautifulSoup(t,"html.parser")
resu_price=soup.find_all("div",attrs={"class":"heading-3 margin-y-1 font-weight-bold","data-qa":"Heading","data-test":"vehicleCardPricingBlockPrice"})
resu_mile=soup.find_all("div",attrs={"class":"font-size-1 text-truncate","data-test":"vehicleMileage"})
resu_accident_owners_use=soup.find_all("div",attrs={"class":"vehicle-card-location font-size-1 margin-top-1","data-test":"vehicleCardCondition"})
resu_color=soup.find_all("div", attrs={"class":"vehicle-card-location font-size-1 margin-top-1 text-truncate","data-test":"vehicleCardColors"})

```

هر یک از صفحات وب به دست آمده:

به صورت کد دریافت می‌شوند و به صورت html جدا (parse) می‌شوند.

در خطوط بعدی، با توجه به اینکه هر داده در یک div از صفحات وب موجود است و با توجه به attribute آن، همه‌ی آن‌ها دریافت می‌شوند و در لیست‌های مرتبط ذخیره می‌شوند.

```

n=len(resu_price)
for i in range(0,n):
    data_price=resu_price[i]
    data_now_price=data_price.text
    data_mile=resu_mile[i]
    data_now_mile=data_mile.text
    data_accident_owner_use=resu_accident_owners_use[i]
    data_now_accident_owner_use=data_accident_owner_use.text
    data_list=data_now_accident_owner_use.split()

```

آماده‌سازی داده‌های بدست آمده برای جداسازی و وارد کردن آن‌ها در لیست‌های در نظر گرفته شده.

```

if len(data_list)!=5:
    data_now_owner="0"
else:
    data_now_owner=data_list[2]
    data_now_use=data_list[-2]
    data_now_accident=data_list[0]
    if data_now_accident[0]=="N":
        data_now_accident="0"

```

در شرط اول، این حالت مورد بررسی می‌شود که آیا هر ۵ داده موردنظر از سایت دریافت شده است یا نه. در برخی از کیس‌ها، تعداد صاحبان خودرو ثبت نشده است که برای این عدد صفر در نظر گرفته می‌شود.

در شرط بعدی، با توجه به اینکه از عبارت No Accidents برای نشان داده صفر تصادف استفاده شده، این موضوع بررسی می‌شود و عدد صفر جایگزین می‌شود.

```
data_color=resu_color[i]
data_now_color=data_color.text
data_list=data_now_color.split()
data_now_color_exterior=data_list[0]
data_now_color_interior=data_list[2]
```

آماده‌سازی داده‌ها برای نمایش کیس‌هایی که دریافت شده‌اند.

```
print("Mileage = ",data_now_mile," | ", "Price = ",data_now_price," | ",
      "Accidents = ",data_now_accident," | ", "Owners = ",data_now_owner," | ",
      "Use = ",data_now_use," | ", "Exterior Color = ",
      "data_now_color_exterior," | ", "Interior Color = ",
      "data_now_color_interior")
data_final=(data_now_mile,data_now_price,data_now_accident,data_now_owner,
            data_now_use,data_now_color_exterior,data_now_color_interior)
price.append(data_now_price)
data_list=data_now_mile.split()
mile.append(data_list[0])
accident.append(data_now_accident)
owner.append(data_now_owner)
use.append(data_now_use)
```

در ابتدا، هر کیسی که با آن سازنده و مدل موجود است را نمایش داده می‌شود.

در خطوط بعدی، کیس‌ها با توجه به ویژگی‌هایی که در صورت مسئله تعریف شده است، به صورت مرتب در ۶ لیست مورد نظر وارد می‌شوند.

بعد از این فرآیند، داده‌های مورد نیاز برای الگوریتم رگرسیون خطی در اختیار است.

```
print("-- MACHINE LEARNING BEGINS NOW --")
price1=list(map(lambda x: x[1:],price))
price1=list(map(delete_b,price1))
mile=list(map(delete_b,mile))
```

آغاز بخش یادگیری ماشین و حذف کاراکتر "، از داده‌هایی که موجود است با استفاده از تابعی که قبل تعریف شد.

```
from sklearn import linear_model
x=[]
y=[]
```

وارد کردن کتابخانه sklearn و مدل رگرسیون خطی.

آماده‌سازی لیست ورودی‌ها و خروجی‌ها.

```
n=len(price)
for i in range(0,n):
    if use[i]=="Fleet":
        use[i]="1"
    else:
        use[i]="0"
    x1=[mile[i],accident[i],owner[i],use[i]]
    x.append(x1)
    y.append(price1[i])
```

آماده‌سازی ورودی و خروجی‌ها با توجه به داده‌ها:

ورودی: یک لیست که شامل مایل حرکت کرده، تعداد تصادفات، تعداد صاحبان و نوع کاربری است.

خروجی: قیمتی که در سایت برای آن در نظر گرفته شده است.

در شرط نیز، نوع کاربری از Fleet و Personal به اعداد صفر و یک تغییر پیدا می‌کند تا بتوان از الگوریتم استفاده کرد.

```
clf=linear_model.LinearRegression()
clf=clf.fit(x,y)
```

یافتن مدل رگرسیون خطی مناسب برای این داده‌ها. (نحوه‌ی عملکرد رگرسیون خطی به صورت مفصل در بخش تئوری مورد بررسی قرار گرفته است.)

```
print("Mile = ",end="")
mile_new=input()
print("Accident = ",end="")
accident_new=input()
print("Owner = ",end="")
owner_new=input()
print("Use = ",end="")
use_new=input()
if use_new=="Fleet":
    use_new="1"
else:
    use_new="0"
```

دریافت ویژگی‌های خودروی کاربر.

```
new_data=[mile_new,accident_new,owner_new,use_new]
answer=clf.predict([new_data])
print("ML prediction is that its worth $" , int(answer[0]))
```

ساخت ورودی برای مدل رگرسیون خطی و پیش‌بینی قیمت برای خودرو و نمایش آن.

بررسی یک مثال:

هدف آن است که قیمت یک Audi با مدل S7 با این ویژگی‌ها را پیش‌بینی شود:

مایل حرکت کرده: ۶۵۰۰۰

تعداد تصادف: ۱

تعداد صاحبان: ۱

نوع کاربری: Personal

Name of the car:
Make = audi
Model = s7
Mileage = 58,224 miles Price = \$48,999 Accidents = 0 Owners = 0 Use = Personal Exterior Color = Black Interior Color = Black
Mileage = 88,260 miles Price = \$29,988 Accidents = 0 Owners = 0 Use = Personal Exterior Color = Gray Interior Color = Black
Mileage = 94,052 miles Price = \$29,996 Accidents = 0 Owners = 0 Use = Personal Exterior Color = Blue Interior Color = Gray
Mileage = 49,165 miles Price = \$47,993 Accidents = 0 Owners = 0 Use = Personal Exterior Color = Silver Interior Color = Black
Mileage = 8,340 miles Price = \$55,250 Accidents = 0 Owners = 0 Use = Personal Exterior Color = Silver Interior Color = Black
Mileage = 24,604 miles Price = \$41,600 Accidents = 0 Owners = 0 Use = Personal Exterior Color = White Interior Color = Black
Mileage = 17,642 miles Price = \$91,995 Accidents = 0 Owners = 0 Use = Personal Exterior Color = White Interior Color = Black
Mileage = 72,621 miles Price = \$41,888 Accidents = 0 Owners = 0 Use = Personal Exterior Color = White Interior Color = Black
Mileage = 4,818 miles Price = \$99,000 Accidents = 0 Owners = 0 Use = Personal Exterior Color = White Interior Color = Red

Mileage = 26,068 miles		Price = \$61,524		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 58,654 miles		Price = \$35,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 15,485 miles		Price = \$94,600		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 68,951 miles		Price = \$44,998		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 84,389 miles		Price = \$32,982		Accidents = 1		Owners = 0		Use = Personal		Exterior Color = Blue		Interior Color = Black
Mileage = 44,352 miles		Price = \$42,449		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 72,510 miles		Price = \$35,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 26,426 miles		Price = \$64,364		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Red
Mileage = 34,887 miles		Price = \$53,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 83,155 miles		Price = \$34,900		Accidents = 1		Owners = 0		Use = Personal		Exterior Color = Silver		Interior Color = Black
Mileage = 32,000 miles		Price = \$63,500		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 23,782 miles		Price = \$63,000		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 90,862 miles		Price = \$33,990		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Unknown
Mileage = 76,175 miles		Price = \$46,908		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Gray

Mileage = 45,151 miles		Price = \$57,200		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 14,122 miles		Price = \$103,998		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 37,712 miles		Price = \$46,999		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 60,526 miles		Price = \$47,990		Accidents = 1		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 50,225 miles		Price = \$56,495		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Red		Interior Color = Black
Mileage = 81,255 miles		Price = \$26,990		Accidents = 0		Owners = 0		Use = Fleet		Exterior Color = Black		Interior Color = White
Mileage = 4,738 miles		Price = \$107,900		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Red
Mileage = 51,734 miles		Price = \$51,902		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 43,044 miles		Price = \$53,999		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 88,260 miles		Price = \$29,988		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 94,052 miles		Price = \$29,996		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Blue		Interior Color = Gray
Mileage = 49,165 miles		Price = \$47,993		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Silver		Interior Color = Black
Mileage = 8,340 miles		Price = \$55,250		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Silver		Interior Color = Black
Mileage = 24,604 miles		Price = \$41,600		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black

Mileage = 17,642 miles Price = \$91,995 Accidents = 0 Owners = 0 Use = Personal Exterior Color = White Interior Color = Black
Mileage = 72,621 miles Price = \$41,888 Accidents = 0 Owners = 0 Use = Personal Exterior Color = White Interior Color = Black
Mileage = 4,818 miles Price = \$99,000 Accidents = 0 Owners = 0 Use = Personal Exterior Color = White Interior Color = Red
Mileage = 26,068 miles Price = \$61,524 Accidents = 0 Owners = 0 Use = Personal Exterior Color = White Interior Color = Black
Mileage = 58,654 miles Price = \$35,995 Accidents = 0 Owners = 0 Use = Personal Exterior Color = Gray Interior Color = Black
Mileage = 15,485 miles Price = \$94,600 Accidents = 0 Owners = 0 Use = Personal Exterior Color = Black Interior Color = Black
Mileage = 68,951 miles Price = \$44,998 Accidents = 0 Owners = 0 Use = Personal Exterior Color = Black Interior Color = Black
Mileage = 84,389 miles Price = \$32,982 Accidents = 1 Owners = 0 Use = Personal Exterior Color = Blue Interior Color = Black
Mileage = 44,352 miles Price = \$42,449 Accidents = 0 Owners = 0 Use = Personal Exterior Color = White Interior Color = Black
Mileage = 72,510 miles Price = \$35,995 Accidents = 0 Owners = 0 Use = Personal Exterior Color = White Interior Color = Black
Mileage = 26,426 miles Price = \$64,364 Accidents = 0 Owners = 0 Use = Personal Exterior Color = White Interior Color = Red
Mileage = 34,887 miles Price = \$53,995 Accidents = 0 Owners = 0 Use = Personal Exterior Color = White Interior Color = Black
Mileage = 83,155 miles Price = \$34,900 Accidents = 1 Owners = 0 Use = Personal Exterior Color = Silver Interior Color = Black
Mileage = 32,000 miles Price = \$63,500 Accidents = 0 Owners = 0 Use = Personal Exterior Color = White Interior Color = Black

Mileage = 23,782 miles		Price = \$63,000		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 90,862 miles		Price = \$33,990		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Unknown
Mileage = 76,175 miles		Price = \$46,908		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Gray
Mileage = 45,151 miles		Price = \$57,200		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 14,122 miles		Price = \$103,998		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 37,712 miles		Price = \$46,999		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 60,526 miles		Price = \$47,990		Accidents = 1		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 50,225 miles		Price = \$56,495		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Red		Interior Color = Black
Mileage = 81,255 miles		Price = \$26,990		Accidents = 0		Owners = 0		Use = Fleet		Exterior Color = Black		Interior Color = White
Mileage = 4,738 miles		Price = \$107,900		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Red
Mileage = 51,734 miles		Price = \$51,902		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 43,044 miles		Price = \$53,999		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 88,260 miles		Price = \$29,988		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 94,052 miles		Price = \$29,996		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Blue		Interior Color = Gray

Mileage = 49,165 miles		Price = \$47,993		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Silver		Interior Color = Black
Mileage = 8,340 miles		Price = \$55,250		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Silver		Interior Color = Black
Mileage = 24,604 miles		Price = \$41,600		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 17,642 miles		Price = \$91,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 72,621 miles		Price = \$41,888		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 4,818 miles		Price = \$99,000		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Red
Mileage = 26,068 miles		Price = \$61,524		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 58,654 miles		Price = \$35,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 15,485 miles		Price = \$94,600		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 68,951 miles		Price = \$44,998		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 84,389 miles		Price = \$32,982		Accidents = 1		Owners = 0		Use = Personal		Exterior Color = Blue		Interior Color = Black
Mileage = 44,352 miles		Price = \$42,449		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 72,510 miles		Price = \$35,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 26,426 miles		Price = \$64,364		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Red

Mileage = 34,887 miles		Price = \$53,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
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Mileage = 32,000 miles		Price = \$63,500		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 23,782 miles		Price = \$63,000		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 90,862 miles		Price = \$33,990		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Unknown
Mileage = 76,175 miles		Price = \$46,908		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Gray
Mileage = 45,151 miles		Price = \$57,200		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
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Mileage = 81,255 miles		Price = \$26,990		Accidents = 0		Owners = 0		Use = Fleet		Exterior Color = Black		Interior Color = White
Mileage = 4,738 miles		Price = \$107,900		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Red
Mileage = 51,734 miles		Price = \$51,902		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black

Mileage = 58,224 miles		Price = \$48,999		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 88,260 miles		Price = \$29,988		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 94,052 miles		Price = \$29,996		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Blue		Interior Color = Gray
Mileage = 49,165 miles		Price = \$47,993		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Silver		Interior Color = Black
Mileage = 8,340 miles		Price = \$55,250		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Silver		Interior Color = Black
Mileage = 24,604 miles		Price = \$41,600		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 17,642 miles		Price = \$91,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 72,621 miles		Price = \$41,888		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 4,818 miles		Price = \$99,000		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Red
Mileage = 26,068 miles		Price = \$61,524		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 58,654 miles		Price = \$35,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 15,485 miles		Price = \$94,600		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 68,951 miles		Price = \$44,998		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 84,389 miles		Price = \$32,982		Accidents = 1		Owners = 0		Use = Personal		Exterior Color = Blue		Interior Color = Black

Mileage = 44,352 miles		Price = \$42,449		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 72,510 miles		Price = \$35,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 26,426 miles		Price = \$64,364		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Red
Mileage = 34,887 miles		Price = \$53,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 83,155 miles		Price = \$34,900		Accidents = 1		Owners = 0		Use = Personal		Exterior Color = Silver		Interior Color = Black
Mileage = 32,000 miles		Price = \$63,500		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 23,782 miles		Price = \$63,000		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 90,862 miles		Price = \$33,990		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Unknown
Mileage = 76,175 miles		Price = \$46,908		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Gray
Mileage = 45,151 miles		Price = \$57,200		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 14,122 miles		Price = \$103,998		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 37,712 miles		Price = \$46,999		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 60,526 miles		Price = \$47,990		Accidents = 1		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 50,225 miles		Price = \$56,495		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Red		Interior Color = Black

Mileage = 81,255 miles		Price = \$26,990		Accidents = 0		Owners = 0		Use = Fleet		Exterior Color = Black		Interior Color = White
Mileage = 4,738 miles		Price = \$107,900		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Red
Mileage = 51,734 miles		Price = \$51,902		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 43,044 miles		Price = \$53,999		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 88,260 miles		Price = \$29,988		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 94,052 miles		Price = \$29,996		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Blue		Interior Color = Gray
Mileage = 49,165 miles		Price = \$47,993		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Silver		Interior Color = Black
Mileage = 8,340 miles		Price = \$55,250		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Silver		Interior Color = Black
Mileage = 24,604 miles		Price = \$41,600		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 17,642 miles		Price = \$91,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 72,621 miles		Price = \$41,888		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 4,818 miles		Price = \$99,000		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Red
Mileage = 26,068 miles		Price = \$61,524		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 58,654 miles		Price = \$35,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black

Mileage = 15,485 miles		Price = \$94,600		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 68,951 miles		Price = \$44,998		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 84,389 miles		Price = \$32,982		Accidents = 1		Owners = 0		Use = Personal		Exterior Color = Blue		Interior Color = Black
Mileage = 44,352 miles		Price = \$42,449		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 72,510 miles		Price = \$35,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 26,426 miles		Price = \$64,364		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Red
Mileage = 34,887 miles		Price = \$53,995		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 83,155 miles		Price = \$34,900		Accidents = 1		Owners = 0		Use = Personal		Exterior Color = Silver		Interior Color = Black
Mileage = 32,000 miles		Price = \$63,500		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black
Mileage = 23,782 miles		Price = \$63,000		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Black
Mileage = 90,862 miles		Price = \$33,990		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Unknown
Mileage = 76,175 miles		Price = \$46,908		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Gray		Interior Color = Gray
Mileage = 45,151 miles		Price = \$57,200		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = Black		Interior Color = Black
Mileage = 14,122 miles		Price = \$103,998		Accidents = 0		Owners = 0		Use = Personal		Exterior Color = White		Interior Color = Black

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Mileage = 37,712 miles | Price = $46,999 | Accidents = 0 | Owners = 0 | Use = Personal | Exterior Color = Black | Interior Color = Black
Mileage = 60,526 miles | Price = $47,990 | Accidents = 1 | Owners = 0 | Use = Personal | Exterior Color = Gray | Interior Color = Black
Mileage = 50,225 miles | Price = $56,495 | Accidents = 0 | Owners = 0 | Use = Personal | Exterior Color = Red | Interior Color = Black
Mileage = 81,255 miles | Price = $26,990 | Accidents = 0 | Owners = 0 | Use = Fleet | Exterior Color = Black | Interior Color = White
Mileage = 4,738 miles | Price = $107,900 | Accidents = 0 | Owners = 0 | Use = Personal | Exterior Color = White | Interior Color = Red
Mileage = 51,734 miles | Price = $51,902 | Accidents = 0 | Owners = 0 | Use = Personal | Exterior Color = Black | Interior Color = Black
-- MACHINE LEARNING BEGINS NOW --
Mile = 65000
Accident = 1
Owner = 1
Use = Personal
ML prediction is that its worth $ 46069
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طبق این الگوریتم، ارزش این خودرو 46069 دلار است.