

Aim:

You are required to implement an application that manages components of different automobiles. The application should allow users to add components, remove components, display all current components, and exit the application. Use a dictionary to store automobile components, where the keys are automobile names and the values are their corresponding components.

Implement the following functions:

- **display_components(components)**: This function takes a dictionary of components and prints each automobile along with its component in the format: automobile: component.
- **add_component(components, automobile, component)**: This function takes the dictionary of components, an automobile name, and a component to add, adding the component to the automobile in the dictionary.
- **remove_component(components, automobile)**: This function takes the dictionary of components and an automobile name. If the automobile exists, it removes the entry and prints a confirmation message; otherwise, it prints a "not found" message.

Initialize an empty dictionary to store automobile components.

Use a loop to continuously display a menu that allows the user to:

- Display all automobile components
- Add a new component to an automobile
- Remove an existing component from an automobile
- Quit the application

Input Format:

- The application should prompt the user for their choice of action (1 to 4).
- If the user chooses to add or remove a component, the application should prompt for the name of the automobile and the component.

Output Format:

The program should print appropriate messages based on user actions, such as:

- Displaying all current automobile components.
- Confirming when a component has been added or removed.
- Indicating if an automobile to remove was not found.
- Exiting the application.

Source Code:

automobiles.py

```
am={}
while(True):
    print("Automobile Components Application")
    print("1.Display Components")
    print("2.Add Component")
    print("3.Remove Component")
    print("4.Quit")
    a=int(input("Enter your choice:"))
    if(a==1):
        l=len(am)
```

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    print("Components of Automobiles:")
    for i,j in am.items():
        print("{}:{}".format(i,j))
elif(a==2):
    x=input("name of the automobile:")
    y=input("component to add:")
    am[x]=y
    print("added")
elif(a==3):
    s=input("name of the automobile:")
    if(s not in am):

        print("not found")
    else:
        am.pop(s)
        print("removed")
elif(a==4):
    print("Exiting the automobile components application")
    breakpoint
else:
    print("Invalid choice")
#Execution Results - All test cases have succeeded!

```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Automobile Components Application 2
1.Display Components 2
2.Add Component 2
3.Remove Component 2
4.Quit 2
Enter your choice: 2
name of the automobile: ford
component to add: enginee
added 2
Automobile Components Application 2
1.Display Components 2
2.Add Component 2
3.Remove Component 2
4.Quit 2
Enter your choice: 2
name of the automobile: buik
component to add: glass
added 1
Automobile Components Application 1
1.Display Components 1
2.Add Component 1
3.Remove Component 1
4.Quit 1
Enter your choice: 1
Components of Automobiles: 5
ford:enginee 5

buik:glass 5
Automobile Components Application 5
1.Display Components 5
2.Add Component 5
3.Remove Component 5
4.Quit 5
Enter your choice: 5
Invalid choice 3
Automobile Components Application 3
1.Display Components 3
2.Add Component 3
3.Remove Component 3
4.Quit 3
Enter your choice: 3
name of the automobile: ford
removed 1
Automobile Components Application 1
1.Display Components 1
2.Add Component 1
3.Remove Component 1
4.Quit 1
Enter your choice: 1
Components of Automobiles: 4
buik:glass 4
Automobile Components Application 4
1.Display Components 4
2.Add Component 4
3.Remove Component 4
4.Quit 4
Enter your choice: 4
Exiting the automobile components application

Test Case - 2
User Output
Automobile Components Application 5
1.Display Components 5
2.Add Component 5
3.Remove Component 5
4.Quit 5
Enter your choice: 5
Invalid choice 3
Automobile Components Application 3
1.Display Components 3
2.Add Component 3
3.Remove Component 3
4.Quit 3
Enter your choice: 3
name of the automobile: jaguar
not found 4
Automobile Components Application 4
1.Display Components 4
2.Add Component 4
3.Remove Component 4
4.Quit 4

Enter your choice: 4
Exiting the automobile components application