

In [2]:

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# coding: utf-8

# In[41]:

#####Importing the required Libraries#####
try:
    import json
    import os
    import time
except:
    get_ipython().system('pip install json')
    get_ipython().system('pip install os ')
    get_ipython().system('pip install time')
    import json
    import os
    import time

def save(dic,dic2,time_dic,t_allowed_dic):
    """Funtion used to save the dictionary(Key-value Pairs) into a JSON file"""

    dic.update(dic2)
    out_file = open(path + "/pairs.json", "w")
    json.dump( dic,out_file)
    out_file.close()

    out_file = open(path + "/ttlpairs.json", "w")
    json.dump( dic2,out_file)
    out_file.close()

    out_file = open(path + "/start_time.json", "w")
    json.dump( time_dic,out_file)
    out_file.close()

    out_file = open(path + "/time_allowed.json", "w")
    json.dump( t_allowed_dic,out_file)
    out_file.close()

def getPath(c):
    """Funtion used to set directory to the input/ default directory"""
    if (c=="y"):
        path=input("\nEnter destination to store the data \n")
    else:
        path = os.getcwd()
        path.replace('\\', '/')
    return (path)

def getKey():
    """Funtion used to obtain key input from user"""

    key = str(input("\nEnter Key \n"))
    return(key)

def getValue():

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"""Funtion used to obtain value input from user"""

value=input("\nEnter Value \n")
return(value)
def createKeyValuePair(dic,dic2,time_dic,t_allowed_dic):

    """Funtion used to create key value pair"""

    key=getKey()
    value=getValue()

    #check if key is present
    if (key in dic):
        #if yes : error already present
        print("\nError:Key already present.Try with a different key \n.")
    #if no :
    else:
        #checkkey
        if(checkKey(key)):
            #checkValue
            if(checkValue(value)):
                #add to dictionary
                #ask for time to live property
                ttlsave = input("\nDo you want to have ttl property? y for yes else any cha
                if (ttlsave=="y"):
                    #t_allowed: Time allowed for the key value pair before it gets deleted
                    t_allowed = int(input("Enter seconds \n"))
                    t_allowed_dic[key]=t_allowed
                    start_time = time.time()
                    #time_dic stores the start time of all ttl key-value pairs
                    time_dic[key]=start_time
                    dic2[key] = value
                #ttl:no
            else:
                dic[key] = value
                save(dic,dic2,time_dic,t_allowed_dic)
        #value validation error
    else:
        print("\nError: Value is not a JSON Object or size is not less than 16KB \n
    #key validation error
    else:
        print("\nError: The key has more than 32 characters, Please try again with less

def readValue(dic,dic2,time_dic,t_allowed_dic):
    """function to retrieve value from the data store given a key"""

    key=getKey()

    #check if key is present and was of ttl
    if(key in time_dic):
        end = time.time()
        elapsed = int(end-time_dic[key])
        #print(elapsed,t_allowed_dic[key]):used for debugging
        if(elapsed>t_allowed_dic[key]):
            print("Cannot access : key expired")
            del time_dic[key]
            del dic[key]
            del dic2[key]
            del t_allowed_dic[key]
        else:
            print(dic2[key])

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#if key was not ttl and is present
elif(key in dic):
    #if yes : #Write code to retrieve and return the value obtained
    print(dic[key]+ '      is the value stored for key ' + key)

#key not present
else:
    print("\\n Error: The key is not present in the data store.\\n")

def deleteKey(dic,dic2,time_dic,t_allowed_dic):

    """Funtion to delete a key value pair """

    key=getKey()

    #check if key is present
    if (key in dic):
        #if yes : Delete
        del dic[key]
        #if no : Error : Not present

    elif(key in time_dic):
        end = time.time()
        elapsed = int(end-time_dic[key])
        if(elapsed>t_allowed_dic[key]):
            print("\\nCannot access : key expired")
            del time_dic[key]

        else:
            print("\\nKey Deleted")
            del time_dic[key]

    else:
        print("\\nError: The key is not present in the data store. \\n")
    save(dic,dic2,time_dic,t_allowed_dic)

def checkKey(key):

    """Funtion to check the requirements for a key"""

    #write code to check the requirements for key
    if(len(key)<=32):
        return True
        #good to go
    else:
        return False

def validateJSON(jsonData):
    """Funtion to check the requirements of json object value"""

    try:
        json.loads(jsonData)
    except ValueError as err:
        return False
    return True

def checkValue(value):

    """Funtion to check the requirement of value"""

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if(validateJSON(value)):
    #check if size is less than 16KB
    if(len(value)<128000):
        return True
    else:
        return False
else:
    return False

def main():

    """Main function which sets directory and calls other functions

        dic: Stores all key value pairs
        dic2 : stores all ttl based key-value pairs
        time_dic: Stores the start time of all pairs
        t_allowed_dic : Stores the time allowed before deletion for all pairs."""
    #ask for directory
    c = str(input("\nDo you want to set a working directory? if yes :enter y as input \n"))
    global path
    path=getPath(c)

    #retrieve files at directory
    with open('pairs.json') as json_file:
        dic = json.load(json_file)
    with open('ttlpairs.json') as json_file:
        dic2= json.load(json_file)
    with open('start_time.json') as json_file:
        time_dic= json.load(json_file)
    with open('time_allowed.json') as json_file:
        t_allowed_dic= json.load(json_file)

    #print(dic) : used for debugging

    while(True):
        #looping until user enters end
        functions = {"create":createKeyValuePair,"read":readValue,"delete":deleteKey}
        choice = input("Enter choice create/read/delete/end \n")
        if(choice=="end"):
            print("The program has ended \n")
            break
        elif(choice=="create" or choice=="read" or choice=="delete"):
            functions[choice](dic,dic2,time_dic,t_allowed_dic)
        else:
            print("Please enter valid choice \n \n")

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In [5]:

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main()  
#test1 done:  
#set directory  
# Created a pair (not -ttl)  
# entered valid key,value  
# Read operation  
# delete operation  
# reading after delete  
# end operation
```

Do you want to set a working directory? if yes :enter y as input  
y

Enter destination to store the data  
C:\Users\Charu\Desktop\keyvalue\_datastore  
Enter choice create/read/delete/end  
create

Enter Key  
test1

Enter Value  
{ "name":"John", "age":30, "car":null }

Do you want to have ttl property? y for yes else any character  
n  
Enter choice create/read/delete/end  
read

Enter Key  
test1  
{ "name":"John", "age":30, "car":null } is the value stored for key test  
1  
Enter choice create/read/delete/end  
delete

Enter Key  
test1  
Enter choice create/read/delete/end  
read

Enter Key  
test1

Error: The key is not present in the data store.

Enter choice create/read/delete/end  
end  
The program has ended

**All of test1 ran successfully.**

In [6]:

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main()
#test 2
# create a ttl pair of 10 sec
# read before 10 sec
# read after 10 sec
# create a pair with valid key but invalid value
# create pair with invalid key but valid value
```

Do you want to set a working directory? if yes :enter y as input  
y

Enter destination to store the data  
C:\Users\Charu\Desktop\keyvalue\_datastore  
Enter choice create/read/delete/end  
create

Enter Key  
test2

Enter Value  
{ "name":"John", "age":30, "car":null }

Do you want to have ttl property? y for yes else any character  
y

Enter seconds  
10  
Enter choice create/read/delete/end  
read

Enter Key  
test2  
{ "name":"John", "age":30, "car":null }  
Enter choice create/read/delete/end  
read

Enter Key  
test2  
Cannot access : key expired  
Enter choice create/read/delete/end  
create

Enter Key  
test2

Enter Value  
"json":value

Error: Value is not a JSON Object or size is not less than 16KB

Enter choice create/read/delete/end  
create

Enter Key  
123456123456123456123456123456123456

Enter Value  
{ "name":"John", "age":30, "car":null }

Error: The key has more than 32 characters, Please try again with lesser characters.

Enter choice create/read/delete/end  
end  
The program has ended

**All of test2 ran successfully.**