Binary Files

Introduction

- A binary file is a computer file that is not a text file.
- The term "binary file" is often used as a term meaning "non-text file“
- A **binary file** is computer-readable but not human-readable.
- A **binary file** is a **file** stored in **binary** format.

Use of Binary Files

- A binary file is usually very much smaller than a text file that contains an equivalent amount of data.
- For image, video, and audio data this is important. Small files save **storage** space, can be transmitted faster, and are processed faster.

Binary File Operations

- Create a Binary File
- Read record from binary file
- Append record in Binary File
- Read Multiple Records in Binary File
- Delete a record in a Binary File
- Update a record in Binary File

Packages Required

- pickle – Pickle module is used to serialize data into binary format
  - dump() - function to write data in binary file
  - load() – read data from binary file
- OS – Os module provide common functions to manage the files and directories
  - remove() – remove a file from disk
  - rename() – rename a file on the disk i.e. rename old filename with new filename.

    rename("oldfilename","newfilename")

Create a Binary File

Method :1.1 (sentence form)

mode ‘b’ is compulsory to perform with binary files

```
import pickle

file = open('student.dat', 'wb')
pickle.dump(“this is the file content”,file)
file.close()

print('Binary file Generated...')
```

Create a Binary File

Method :1.2 (sentence form)

```
import pickle

student = [‘ram is a good boy’,’rita is a good girl’]

file = open('student.dat', 'wb')
pickle.dump(student,file)
file.close()

print('Binary file Generated...')
```

mode ‘b’ is compulsory to perform with binary files

Create a Binary File

Method :2(nested list form)

```
import pickle

student = [[1,”reena”,56],[2,”teena”,76]]

file = open('student.dat', 'wb')
pickle.dump(student,file)
file.close()

print('Binary file Generated...')
```

mode ‘b’ is compulsory to perform with binary files

Create a Binary File

Method :3(take entry from user and can add multiple records in a file)

```
import pickle

name = input('Enter name :')
roll = int(input('Enter roll :'))

student = [name,roll]

file = open('student.dat', 'wb')
pickle.dump(student,file)
file.close()

print('Binary file Generated...')
```

mode ‘b’ is compulsory to perform with binary files

```
Enter name :reena
Enter roll :10
Binary file Generated...
```

Create a Binary File

Method :4(take entry from user and append in a list,i.e. add single record at a time

```
import pickle

name = input('Enter name :')
roll = int(input('Enter roll :'))
s = [name,roll]
student=[]
student.append(s)

file = open('student.dat', 'wb')
pickle.dump(student,file)
file.close()

print('Binary file Generated...')
```

mode ‘b’ is compulsory to perform with binary files

```
Enter name :reena
Enter roll :10
Binary file Generated...
```

Read Data from Binary File

Method :1(to read one record at a time)

```
import pickle
file = open('student.dat', 'rb')
data = pickle.load(file)
print(data)
file.close()
```

'rb' stand for reading mode + binary file

Read Data from Binary File

Method :2.1(to read 3 records)

```
import pickle
file = open('student.dat', 'rb')
data = pickle.load(file)
r = pickle.load(file)
y = pickle.load(file)
print(data)
print(r)
print(y)
file.close()
```

'rb' stand for reading mode + binary file

Read Data from Binary File

Method :2.2 (to read 3 records using for loop)

```
import pickle
file = open('student.dat', 'rb')
for i in range(3):
    data = pickle.load(file)
    print(data)
file.close()
```

'rb' stand for reading mode + binary file

OR

```
import pickle
file = open('student.dat', 'rb')
for i in range(3):
        for J in pickle.load(f):
                print(J)
file.close()
```

Read Multiple Record from Binary File

Method :3(display all records)

```
import pickle
file = open('student.dat', 'rb')
while True:
    try:
        data = pickle.load(file)
        print(data)
    except:
        break
file.close()
```

Read from Binary File

Method :4(display selective records postion wise)

```
f=open(“student.dat","rb")
g=pickle.load(f)
print("name is ",g[0])
print("rollno ",g[1])
```

```
import pickle

name = input('Enter name :')
roll = int(input('Enter roll :'))

student = [name,roll]

file = open('student.dat', 'wb')
pickle.dump(student,file)
file.close()

print('Binary file Generated...')
```

If records are stored in a list then to display its content

Append Data in Binary File using List Concept

Method :1

```
import pickle
name = input('Enter name :')
roll = int(input('Enter roll :'))
student=[name,roll]
file = open('student.dat', 'ab')
pickle.dump(student, file)
file.close()
print('Binary file appended...')
```

'ab' stand for appending mode in binary file

```
Enter name :sheena
Enter roll :20
Binary file appended...
```

Add/Append Data in Binary File using List Concept

Method :2 using for loop

```
import pickle
N=int(input("enter how many records u want to enter"))
file = open('student.dat', 'ab')
for i in range(N):
        name = input('Enter name :')
        roll = int(input('Enter roll :'))
        student=[name,roll]
        pickle.dump(student, file)
file.close()
print('Binary file appended...')
```

'ab' stand for appending mode in binary file

```
enter how many records u want to enter2
Enter name :sheena
Enter roll :20
Enter name :heena
Enter roll :10
Binary file appended...
```

Add/Append Data in Binary File using List Concept

Method :2 using while loop

```
import pickle
file = open('student.dat', 'ab')
while True:
        name = input('Enter name :')
        roll = int(input('Enter roll :'))
        student=[name,roll]
        pickle.dump(student, file)
        ch=input("More records")
        if(ch=='n' or ch=='N'):
                break
file.close()
print('Binary file appended...')
```

'ab' stand for appending mode in binary file

```
Enter name :sheena
Enter roll :20
More records y
Enter name :heena
Enter roll :10
More records n
Binary file appended...
```

Search Data in Binary File


```
import pickle
n = input('Enter name to search :')
file1 = open('student.dat', 'rb')

while True:
    try:
        data = pickle.load(file1)
        if data[0]==n:
            print(data)
    except:
        break

file1.close()
```

Modify/Update a Record

1. Two Files required
2. OS module required
3. Read a Name of student that you want to delete in a temporary variable
4. Open first file in read mode
5. Open Temporary file in writing mode
6. read first record and save data in a record variable
7. compare temporary name with the name stored in record variable
8. if record match then read new values in this record variable
9. Write your record in Temporary file
10. repeat this process till end of file
11. close both files
12. remove original file
13. rename temporary file as your original file

Update Record

Method :1 (change a single entry in a record)

```
import pickle
import os

file1 = open(‘student.dat', 'rb')
file2 = open('temp.dat', 'wb')
data = pickle.load(file1)
d=[]
for i in data:
    if i[1]==“ayaan”:
        i[2]=65  # or i[2] = input('Enter new marks')
        d.append(i)
    else:
        d.append(i)
pickle.dump(d,file2)
file1.close()
file2.close()
os.remove('student.dat')
os.rename('temp.dat', ‘student.dat')
print('Record updated...')
```

```
# write the file content
f=open(“student.dat","wb")
v=[[1,"ayaan",35],[2,"ajay",76]]
pickle.dump(v,f)
f.close()
```

```
#To display the file content
f=open(“student.dat","rb")
g=pickle.load(f)
print(g)
```

Update Record

Method :2 (change entire record)

```
import pickle
import os
d=[]
file1 = open(‘student.dat', 'rb')
file2 = open('temp.dat', 'wb')
data = pickle.load(file1)
for i in data:
    if i[0]==1:
        d.append([3,"siddharth",97])
    else:
        d.append(i)
pickle.dump(d,file2)
file1.close()
file2.close()
os.remove('student.dat')
os.rename('temp.dat', ‘student.dat')
print('Record updated...')
```

#file content

```
f=open(“student.dat","wb")
v=[[1,"ayaan",35],[2,"ajay",76]]
pickle.dump(v,f)
f.close()
```

#to display the file content

```
f=open(“student.dat","rb")
g=pickle.load(f)
print(g)
```

Update records

Method :4

To modify the record

```
x=False
    f=open("aa.dat","rb")
    f1=open("temp.dat","wb")
    dispr()
    a=int(input("enter product no which we want to update:"))
    while True:
        try:
            s=pickle.load(f)
            if a==s[0]:
                print("current name",s[1])
                s[1]=input("enter name")
                s[2]=float(input("enter price"))
                pickle.dump(s,f1)
                x=True
            else:
                pickle.dump(s,f1)
        except:
            break
    if(x==False):
        print("record not found")

    f.close()
    f1.close()
    os.remove("aa.dat")
    os.rename("temp.dat","aa.dat")

    f2=open("aa.dat","rb")
    while True:
        try:
            s=pickle.load(f)
            print(s)
        except:
            break
    f2.close()
```

Delete a Record

1. Two Files required
2. OS module required
3. Read Name of student that you want to delete
4. Open first file in **read mode**
5. Open Temporary file in **writing mode**
6. read **first record** and save data in a record variable
7. compare the **name** with the name stored in **record variable**
8. if **record matches** than do not write the same record in temporary file and read next record
9. **if record does not match** then write this record in **temporary file** and then read the next record.
10. **repeat this process till end of file**
11. close both files
12. remove original file
13. **rename temporary file as your original file**

Delete Record


```
import pickle
import os

n = input('Enter name to delete :')

file1 = open('student.dat', 'rb')
file2 = open('temp.dat', 'wb')

while True:
    try:
        data = pickle.load(file1)
        if data[1]!= n:
            pickle.dump(data,file2)
    except:
        break
file1.close()
file2.close()
os.remove('student.dat')
os.rename('temp.dat', 'student.dat')
print('Record deleted...')
```

```
Enter name to delete :reena
Record deleted...
```

Create a Binary File using Dictionary concept


```
import pickle

name = input('Enter name :')
roll = int(input('Enter roll :'))

student = {'name': name, 'roll': roll}

file = open('student.dat', 'wb')
pickle.dump(student,file)
file.close()

print('Binary file Generated...')
```

mode ‘b’ is compulsory to perform with binary files

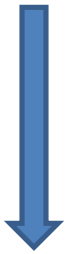
```
Enter name :reena
Enter roll :10
Binary file Generated...
```

Read Data from Binary File using dictionary concept

Method :1(to read one record at a time)

```
import pickle
file = open('student.dat', 'rb')
data = pickle.load(file)
print(data)
file.close()
```

'rb' stand for reading mode + binary file



{'name': 'reena', 'roll': '10'}

```
import pickle

name = input('Enter name :')
roll = int(input('Enter roll :'))

student = {'name': name, 'roll': roll}

file = open('student.dat', 'wb')
pickle.dump(student,file)
file.close()

print('Binary file Generated...')
```

Append Data in Binary File using Dictionary concept


```
import pickle
name = input('Enter name :')
roll = int(input('Enter roll :'))
student = {'name': name, 'roll': roll}
file = open('student.dat', 'ab')
pickle.dump(student, file)
file.close()
print('Binary file appended...')
```

'ab' stand for appending mode in binary file

```
Enter name :sheena
Enter roll :20
Binary file appended...
```

Search Data in Binary File using Dictionary concept


```
import pickle
n = input('Enter name to search :')
file1 = open('student.dat', 'rb')

while True:
    try:
        data = pickle.load(file1)
        if n == data['name']:
            print(data)
    except:
        break

file1.close()
```

Update Record using Dictionary Concept


```
import pickle
import os

n = input('Enter name to delete :')
file1 = open('student.dat', 'rb')
file2 = open('temp.dat', 'wb')
while True:
    try:
        data = pickle.load(file1)
        if n == data['name']:
            data['name'] = input('Enter new name')
        pickle.dump(data,file2)
    except:
        break
file1.close()
file2.close()
os.remove('student.dat')
os.rename('temp.dat', 'student.dat')
print('Record deleted...')
```

Delete Record using Dictionary concept


```
import pickle
import os

n = input('Enter name to delete :')

file1 = open('student.dat', 'rb')
file2 = open('temp.dat', 'wb')

while True:
    try:
        data = pickle.load(file1)
        if n != data['name']:
            pickle.dump(data,file2)
    except:
        break
file1.close()
file2.close()
os.remove('student.dat')
os.rename('temp.dat', 'student.dat')
print('Record deleted...')
```

```
Enter name to delete :reena
Record deleted...
```