



FATHER AGNEL SCHOOL NOIDA

INVESTIGATORY PROJECT

# **Loan Management System**

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supervised by  
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# FATHER AGNEL SCHOOL NOIDA

COMPUTER SCIENCE INVESTIGATORY PROJECT

## *Certificate*

This is to certify that Mr. V. R. Darsh of the class XII-A studying in our institute has completed the project titled "Loan Management System" under the guidance of Mrs. Anika Agarwal. He has done so in part fulfillment of the requirement specified in the curriculum prescribed by Central Board of Secondary Education.

External Examiner

Mrs. Anika Agarwal  
(Teacher and Mentor)

Date: 21 October, 2023

# ACKNOWLEDGMENT

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I am also greatly indebted to my family and my friends for their indebted cooperation.

V. R. Darsh  
XII-A

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# INTRODUCTION

HE Python code was made to record the loans issued and to show also EMI and Total amount which is to be paid by the user. This code doesn't require the user to make his/her own database or tables, only the username and password is required for MySQL.

**NOTE:** The user should have the following libraries downloaded:

- mysql.connector
- Cryptography and sub-library Fernet
- tabulate

To download the libraries, type **pip install <library name>** in command prompt.

## LIBRARIES

The libraries used in the code are as follows:

**MySQL-Connector:** It is used to connect to the database and also execute commands which would make the table and store the data given.

**Cryptography:** It is used to encrypt and decrypt the data and password of user. It uses the Fernet encryption.

**CSV:** The csv module allows users to read and write tabular data in CSV format. This has been used to make a file which store the encrypted password and username of the users.

**Tabulate:** This module helps us to create tables which shows the data in a more systematic and clear way.

# PYTHON CODE

```
1 import mysql.connector as mysql
2 from cryptography.fernet import Fernet
3 import csv
4 from tabulate import tabulate
5
6 filerand=open("pwd.csv", "a+")
7 filerand.close()
8
9 def mysqlcom(user1,pwd1):
10     con=mysql.connect(host="localhost",user=user1,passwd=pwd1)
11     if con.is_connected():
12         print("Connection Established")
13         return "w"
14     else:
15         print("Connection Errors! Kindly check!!!")
16         return "l"
17
18 def enc(k, char):
19     cipher_suite = Fernet(k)
20     encoded_text = cipher_suite.encrypt(char.encode())
21     return encoded_text
22
23 def dec(k, char):
24     cipher_suite = Fernet(k)
25     decoded_text = cipher_suite.decrypt(char)
26     decoded_text_updated = decoded_text.decode()
27     return decoded_text_updated
28
29 def stripp(texa):
30     texb=texa[2:-1]
31     texc=texb.encode()
32     return texc
33
34
35 def login():
36     a=True
37     while a==True:
38         a1=input("Please enter your MySQL username(default=root): ")
39         a2=input("Password(default=root): ")
40         if a1=='':
41             a1='root'
42         if a2=='':
43             a2='root'
44         x= mysqlcom(a1,a2)
45         if (x=="w"):
```

```

46         break
47     else:
48         print("Your Username or Password is incorrect.")
49
50 b=True
51 z=0
52 while b==True:
53     pass
54     n= input("Enter your new username: ")
55     fields = []
56     rows = []
57     with open("pwd.csv","r+") as f1:
58         z=0
59         csvreader = csv.reader(f1)
60         for row in csvreader:
61             rows.append(row)
62         for i in rows:
63             for j in i:
64                 if j!=i[0]:
65                     j1=stripp(j)
66                     ap=dec(stripp(i[0]),stripp(j))
67                     if (ap==n):
68                         z=1
69
70         if z==1:
71             print("Username already exists")
72             continue
73         p= input("Enter your new password: ")
74         p1=input("Enter your new password: ")
75         if p==p1:
76             b=False
77         else:
78             print("Passwords don't match, Please try again")
79
80 with open("pwd.csv", 'a+') as csvfile:
81     csvw=csv.writer(csvfile,delimiter=',')
82     r1=[]
83     cred=[n,p,a1,a2]
84     key = Fernet.generate_key()
85     r1.append(key)
86     for o in cred:
87         f56=enc(key,o)
88         r1.append(f56)
89     csvw.writerow(r1)
90
91 print("Welcome",n)
92 mns(n)
93
94 def logon():

```

```

95 ag=True
96 while ag==True:
97     usr=input("Enter your username: ")
98     fields = []
99     rows = []
100     f1= open("pwd.csv","r")
101     z=0
102     k=0
103     csvreader = csv.reader(f1)
104     for row in csvreader:
105         rows.append(row)
106     for i in rows:
107         for j in i:
108             if j!=i[0]:
109                 j1=stripp(j)
110                 ap=dec(stripp(i[0]),stripp(j))
111                 ap1=dec(stripp(i[0]),stripp(i[2]))
112                 if (ap==usr):
113                     pwd=input("Enter your password: ")
114                     if(pwd==ap1):
115                         print("Welcome Back", usr)
116                         z=1
117                         mnscl(usr)
118                     else:
119                         print("Wrong Password.")
120                         k+=1
121                         if k==3:
122                             print("Maximum attempts reached. Going back
123                             .\n")
124                             screen1()
125                         else:
126                             continue
127                     if z==0 and k==0:
128                         print("There is no user called",usr,".Please Try again.\n
129                         ")
130                         screen1()
131                         f1.close()
132
133 def screen1():
134     print("Good morning")
135     a=input("First time?(y/N)[Enter 0 to quit]:")
136     if(a.lower() in 'nopenadanot '):
137         logon()
138     elif (a.lower() in "yesyep"):
139         login()
140     elif (a=='0'):
141         quit()
142     else:
143         print("Please choose a valid option.\n")

```



```

142         screen1()
143
144     def mnscc(userr):
145         rows=[]
146         f1= open("pwd.csv","r")
147         csvreader = csv.reader(f1)
148         for row in csvreader:
149             rows.append(row)
150         for i in rows:
151             if userr==dec(stripp(i[0]),stripp(i[1])):
152                 usr=dec(stripp(i[0]),stripp(i[1]))
153                 pwd=dec(stripp(i[0]),stripp(i[2]))
154                 sqlusr=dec(stripp(i[0]),stripp(i[3]))
155                 sqlpwd=dec(stripp(i[0]),stripp(i[4]))
156         mydb=mysql.connect(host='localhost',user=sqlusr,passwd=sqlpwd)
157         cursor=mydb.cursor()
158         cursor.execute("show databases;")
159         z1=0
160         for x in cursor:
161             if "loans" in x:
162                 z1+=1
163         if (z1==0):
164             cursor.execute("create database loans;")
165             mydb.commit()
166         tables=[]
167
168         cursor.execute("use loans;")
169         cursor.execute("show tables;")
170         if cursor.fetchall()==[]:
171             x=str("create table "+userr+" (sno int,loanname varchar(50),
172                 loantype varchar(20),loanamt float, loandate date, months int,
173                 roi float,PRIMARY KEY(sno));")
174             cursor.execute(x)
175             cursor.execute("show tables;")
176             for y in cursor:
177                 tables.append(y)
178             for table in tables:
179                 #print("a")
180                 if userr in table:
181                     print("Success")
182                 else:
183                     x=str("create table if not exists "+userr+" (sno int,
184                         loanname varchar(50), loantype varchar(20),loanamt float,
185                         loandate date, months int, roi float,PRIMARY KEY(sno));")
186                     cursor.execute(x)
187
188         asdas=True
189         while asdas==True:
190             inp=input("""You can do the following:\n1.View Loans\n2.Add

```

```

Loans\n3.View Details of Loan\n4.Delete loans\n5.Exit\nWhat do
you want to do?: "")
187     if inp=='1':
188         cursor.execute("select * from "+userr+";")
189         if cursor.fetchall()==[]:
190             print("No records found.\n")
191         else:
192             cursor.execute("select * from "+userr+";")
193             print(tabulate(cursor,headers=["Serial number","Name",
"Type","Amount","Date of Issue","Months","Interest rate % p.a"
],tablefmt='fancy_grid'))
194             print("")
195     elif inp=='2':
196         k1=[]
197         cursor.execute("select * from "+userr+";")
198         for l in cursor:
199             k1.append(l[0])
200         if k1==[]:
201             k1=1
202         else:
203             k1=str(int(k1[-1])+1)
204         a11=input("Item/Purpose for which loan was taken: ")
205         a12=input("Interest type(Coumpound/Simple)(C/S): ")
206         a13=input("Amount borrowed: ")
207         a14=input("Date of issue(YYYY-MM-DD): ")
208         a16=input("Time to return loan(Months): ")
209         a18=input("Rate of Interest per annum:")
210         cursor.execute(str("insert into "+userr+" values("+str(k1
)+","'+str(a11)+'"+',''+str(a12)+'"+',''+str(a13)+'"+',''+str(a14)+'"
',''+str(a16)+'"+',''+str(a18)+'");'))
211         mydb.commit()
212         print("Successfully added.\n")char"2552
213
214
215     elif inp=='3':
216         cursor.execute("select * from "+userr+";")
217         if cursor.fetchall()==[]:
218             print("No records found.\n")
219             continue
220         h=input("Enter the serial number of loan you want to view
: ")
221         cursor.execute("select * from "+userr+" where sno="+h+";"
)
222         print(tabulate(cursor,headers=["Serial number","Name","
Type","Amount","Date of Issue","Months","Interest rate % p.a"],
tablefmt='fancy_grid'))
223         print("")
224         cursor.execute("select * from "+userr+" where sno="+h+";"
)

```

```

225
226         for l in cursor:
227             if l[2].lower() in 'compound':
228
229                 emi=((int(l[3]))*((1 + ((int(l[-1]))/1200))**int(l
[-2]))*((int(l[-1]))/1200))/(((1+(int(l[-1])/1200))**int(l[-2])
)-1)
230
231                 ta= (emi*int(l[-2]))
232                 ti=ta-int(l[3])
233                 print("Your EMI is ",emi)
234                 print("Your total amount is ",ta,"(excluding fees
and charges from lender)")
235                 print("Your total interest is ",ti,"\n")
236
237             elif l[2].lower() in 'simple':
238                 ta= int(l[3])*(1 + (int(l[-1])*int(l[-2])/1200))
239                 emi=int(l[3])*int(l[-1])*int(l[-2])/(1200)
240                 print("Your total interest is ",emi)
241                 print("Your total amount is ",ta,"\n")
242
243         elif inp=='4':
244             cursor.execute("select * from "+userr+";")
245             if cursor.fetchall()==[]:
246                 print("No records found.\n")
247                 continue
248             else:
249                 inp1=input("Enter the serial number of the loan you
want to delete:(enter 0 if not sure) ")
250                 if inp1=='0':
251                     continue
252                 cursor.execute("delete from "+userr+" where sno="+inp1
+";")
253                 mydb.commit()
254                 print("Successfully deleted.\n")
255
256         elif inp=='5':
257             f1.close()
258             quit()
259
260
261         else:
262             print("Choose a valid option.\n")
263
264     screen1()
265
266

```

# FIRST TIME USER INTERACTION

```
Good morning
First time?(y/N)[Enter 0 to quit]:y
Please enter your MySQL username(default=root): root
Password(default=root): vardar
Connection Established
Enter your new username: Darsh
Username already exists
Enter your new username: Dhruv
Enter your new password: 2006
Enter your new password: 2006
Welcome Dhruv
Success
You can do the following:
1.View Loans
2.Add Loans
3.View Details of Loan
4.Delete loans
5.Exit
What do you want to do?: 1
No records found.

You can do the following:
1.View Loans
2.Add Loans
3.View Details of Loan
4.Delete loans
5.Exit
What do you want to do?: 3
No records found.

You can do the following:
1.View Loans
2.Add Loans
3.View Details of Loan
4.Delete loans
5.Exit
```

What do you want to do?: 4  
No records found.

You can do the following:

- 1.View Loans
- 2.Add Loans
- 3.View Details of Loan
- 4.Delete loans
- 5.Exit

What do you want to do?: 2  
Item/Purpose for which loan was taken: Home  
Interest type(Coumpound/Simple)(C/S): C  
Amount borrowed: 6500000  
Date of issue(YYYY-MM-DD): 2023-12-12  
Time to return loan(Months): 240  
Rate of Interest per annum:2  
Successfully added.

You can do the following:

- 1.View Loans
- 2.Add Loans
- 3.View Details of Loan
- 4.Delete loans
- 5.Exit

What do you want to do?: 1

Serial number	Name	Type	Amount	Date of Issue	Months	Interest
1	Home	C	6.5e+06	2023-12-12	240	2

You can do the following:

- 1.View Loans
- 2.Add Loans
- 3.View Details of Loan
- 4.Delete loans
- 5.Exit

What do you want to do?: 3  
Enter the serial number of loan you want to view: 1

Serial number	Name	Type	Amount	Date of Issue	Months	Interest
1	Home	C	6.5e+06	2023-12-12	240	2

Your EMI is 32882.416777932

Your total amount is 7891780.02670368 (excluding fees and charges from lender)

Your total interest is 1391780.02670368

You can do the following:

- 1.View Loans
- 2.Add Loans
- 3.View Details of Loan
- 4.Delete loans
- 5.Exit

What do you want to do?: 4

Enter the serial number of the loan you want to delete:(enter 0 if not sure) 1

Successfully deleted.

You can do the following:

- 1.View Loans
- 2.Add Loans
- 3.View Details of Loan
- 4.Delete loans
- 5.Exit

What do you want to do?: 5

# EXISTING USER INTERACTION

```
Good morning
First time?(y/N)[Enter 0 to quit]:
Enter your username: Darsh
Enter your password: 2006
Welcome Back Darsh
Success
You can do the following:
1.View Loans
2.Add Loans
3.View Details of Loan
4.Delete loans
5.Exit
What do you want to do?: 1
```

Serial number	Name	Type	Amount	Date of Issue	Months	Interest
1	Car	C	1.2e+07	2023-12-13	120	3
2	Home	C	1.5e+06	2023-12-11	180	2

```
You can do the following:
1.View Loans
2.Add Loans
3.View Details of Loan
4.Delete loans
5.Exit
What do you want to do?: 3
Enter the serial number of loan you want to view: 2
```

Serial number	Name	Type	Amount	Date of Issue	Months	Interest
2	Home	C	1.5e+06	2023-12-11	180	2

Your EMI is 9652.630508365695

Your total amount is 1737473.4915058252 (excluding fees and charges from lender)  
Your total interest is 237473.4915058252

You can do the following:

- 1.View Loans
- 2.Add Loans
- 3.View Details of Loan
- 4.Delete loans
- 5.Exit

What do you want to do?: 4

Enter the serial number of the loan you want to delete:(enter 0 if not sure) 1

Successfully deleted.

You can do the following:

- 1.View Loans
- 2.Add Loans
- 3.View Details of Loan
- 4.Delete loans
- 5.Exit

What do you want to do?: 1

Serial number	Name	Type	Amount	Date of Issue	Months	Interest
2	Home	C	1.5e+06	2023-12-11	180	2

You can do the following:

- 1.View Loans
- 2.Add Loans
- 3.View Details of Loan
- 4.Delete loans
- 5.Exit

What do you want to do?: 5



# OUTPUT FILE

The code produces one file named pwd.csv which contains the password and username in encrypted form.

This should be copied and pasted wherever the python code is present, else the credentials will be lost

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	b'f4G6wE	b'gAAAAA	b'gAAAAA	b'gAAAAA	b'gAAAAA	b'fzGKkuvGScmogkbYdxS8OMinvZtMdHTR3MAXpHCMqnEac-UhTq1mWoW7-xqYJQjDbJoTallcc7Okz6BCasNoxyw==												
2	b'c8e9JOUj	b'gAAAAA	b'gAAAAA	b'gAAAAA	b'gAAAAA	b'lhDpIKnibxtNp6Zw9VH78sOtD1yh38llHKO_HTMqmK1PI73lAwc4wVjy7Uf9YUB_115_dlibRihcRPxDCMSmy9syDXA==												
3	b'WAaJF_	b'gAAAAA	b'gAAAAA	b'gAAAAA	b'gAAAAA	b'lhDqSo6oFZdUNFZkP_VX7kfpX-8TBvOLwjBGu_7TlNjv8fkn7dbZp1fzW-fcDFOJWqZopuvlQl64ZamqCXrXlDgptg==												
4	b'19bLhOf	b'gAAAAA	b'gAAAAA	b'gAAAAA	b'gAAAAA	b'lhDOZeHqDUnWdecqy6onZHp68o46me9fevvD0BfjX6kr0EPRWoauQNJldPiaCpf3luuMmXVXC0gl7KKd0zkz-eb7ITQ==												
5	b'H2LWVW	b'gAAAAA	b'gAAAAA	b'gAAAAA	b'gAAAAA	b'lhD20VdifiDgTihK_emRj4m2g-3ZfXqLPWRRTL7KynZMZbYHphEFuB1J84UA9EM463gD4cwTWWY7e8oiuYTD4YP-dQ==												
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# CONCLUSION

In conclusion, developing a Python program with a database has proven to be a powerful and versatile approach for managing and manipulating data. The integration of a database not only facilitates efficient data storage but also enables seamless retrieval, updating, and analysis of information within the application.

The use of Python, with its clean syntax and extensive libraries, contributes to the ease of development and maintenance of the program. Leveraging a database adds a layer of organization and scalability, allowing the application to handle increasing volumes of data while maintaining optimal performance.

Furthermore, the incorporation of a database in a Python program promotes data integrity and security.

These types of applications can be used for personal benefits or managing local businesses.

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