

PasswordProtectionProgram

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Contents

| | | |
|----------|---|----------|
| 1 | Hierarchical Index | 1 |
| 1.1 | Class Hierarchy | 1 |
| 2 | Class Index | 3 |
| 2.1 | Class List | 3 |
| 3 | File Index | 5 |
| 3.1 | File List | 5 |
| 4 | Class Documentation | 7 |
| 4.1 | database.Account Class Reference | 7 |
| 4.1.1 | Detailed Description | 7 |
| 4.2 | database.BaseModel Class Reference | 8 |
| 4.2.1 | Detailed Description | 8 |
| 4.3 | database.Encrypt Class Reference | 8 |
| 4.3.1 | Detailed Description | 9 |
| 4.4 | database.BaseModel.Meta Class Reference | 9 |
| 4.5 | PPP.PPP Class Reference | 9 |
| 4.5.1 | Detailed Description | 10 |
| 4.5.2 | Constructor & Destructor Documentation | 10 |
| 4.5.2.1 | __init__() | 10 |
| 4.5.3 | Member Function Documentation | 11 |
| 4.5.3.1 | addEntry() | 11 |
| 4.5.3.2 | checkMP() | 11 |
| 4.5.3.3 | matchPassword() | 11 |
| 4.5.3.4 | showCreateMP() | 12 |
| 4.5.3.5 | showEntry() | 12 |
| 4.5.3.6 | showLogin() | 12 |
| 4.5.3.7 | showPWPage() | 13 |
| 4.5.3.8 | viewDetails() | 13 |

| | | |
|----------|-------------------------------|-----------|
| 5 | File Documentation | 15 |
| 5.1 | Constants.py File Reference | 15 |
| 5.1.1 | Detailed Description | 15 |
| 5.2 | database.py File Reference | 15 |
| 5.2.1 | Detailed Description | 16 |
| 5.2.2 | Function Documentation | 17 |
| 5.2.2.1 | CreateTables() | 17 |
| 5.2.2.2 | Delete() | 17 |
| 5.2.2.3 | DropTables() | 17 |
| 5.2.2.4 | GetId() | 17 |
| 5.2.2.5 | GetN() | 18 |
| 5.2.2.6 | GetT() | 18 |
| 5.2.2.7 | Insert() | 18 |
| 5.2.2.8 | UpdateP() | 19 |
| 5.2.2.9 | UpdateU() | 19 |
| 5.3 | Encrypt.py File Reference | 19 |
| 5.3.1 | Detailed Description | 19 |
| 5.3.2 | Function Documentation | 20 |
| 5.3.2.1 | cryptDecode() | 20 |
| 5.3.2.2 | cryptEncode() | 20 |
| 5.3.2.3 | generKey() | 21 |
| 5.4 | GenPassword.py File Reference | 21 |
| 5.4.1 | Detailed Description | 21 |
| 5.4.2 | Function Documentation | 21 |
| 5.4.2.1 | genPass() | 21 |
| 5.4.2.2 | genPassCrypt() | 22 |
| 5.5 | inactivity.py File Reference | 22 |
| 5.5.1 | Detailed Description | 22 |
| 5.5.2 | Function Documentation | 22 |
| 5.5.2.1 | config_reset() | 22 |
| 5.5.2.2 | reset_timer() | 23 |
| 5.6 | PPP.py File Reference | 23 |
| 5.6.1 | Detailed Description | 23 |
| 5.7 | PWChecking.py File Reference | 24 |
| 5.7.1 | Detailed Description | 24 |
| 5.7.2 | Function Documentation | 24 |
| 5.7.2.1 | checkLogIn() | 24 |
| 5.7.2.2 | checkMP() | 25 |
| | Index | 27 |

Chapter 1

Hierarchical Index

1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

| | |
|-----------------------------------|---|
| database.BaseModel.Meta | 9 |
| Model | |
| database.BaseModel | 8 |
| database.Account | 7 |
| database.Encrypt | 8 |
| Tk | |
| PPP.PPP | 9 |

Chapter 2

Class Index

2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

| | | |
|---|---|---|
| database.Account | SQLite table to store passwords | 7 |
| database.BaseModel | Base Model for database connection | 8 |
| database.Encrypt | SQLite table to store hash keys and hash values | 8 |
| database.BaseModel.Meta | | 9 |
| PPP.PPP | An ADT that represents the GUI | 9 |

Chapter 3

File Index

3.1 File List

Here is a list of all documented files with brief descriptions:

| | |
|---|----|
| Constants.py | |
| The constants being used in the GUI file (fonts, colours) | 15 |
| database.py | |
| PPP_database | 15 |
| Encrypt.py | |
| Password Encryption | 19 |
| GenPassword.py | |
| Generate Random Password | 21 |
| inactivity.py | |
| Tracks how long user is inactive | 22 |
| PPP.py | |
| The graphical user interface for a password manager | 23 |
| PWChecking.py | |
| Check Passwords | 24 |

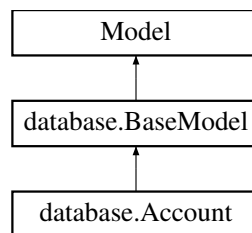
Chapter 4

Class Documentation

4.1 database.Account Class Reference

SQLite table to store passwords.

Inheritance diagram for database.Account:



Static Public Attributes

- **ID** = peewee.PrimaryKeyField()
- **AccName** = peewee.CharField()
- **AccType** = peewee.CharField()
- **UserName** = peewee.CharField(null=True)

4.1.1 Detailed Description

SQLite table to store passwords.

Use peewee orm library to create a table class that stores accounts

Parameters

| | |
|-----------------|--|
| <i>AccID</i> | Account ID and Primary Key |
| <i>AccType</i> | Type of Account used |
| <i>UserName</i> | Account Username |

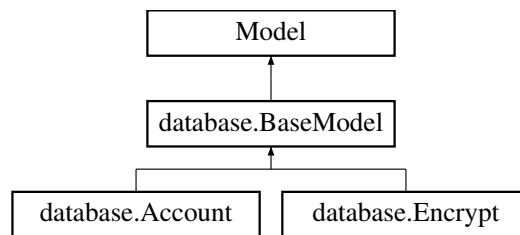
The documentation for this class was generated from the following file:

- [database.py](#)

4.2 database.BaseModel Class Reference

Base Model for database connection.

Inheritance diagram for database.BaseModel:



Classes

- class [Meta](#)

4.2.1 Detailed Description

Base Model for database connection.

All other Tables will connect automatically to our database

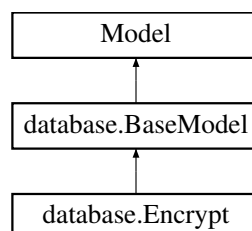
The documentation for this class was generated from the following file:

- [database.py](#)

4.3 database.Encrypt Class Reference

SQLite table to store hash keys and hash values.

Inheritance diagram for database.Encrypt:



Static Public Attributes

- **ID** = peewee.ForeignKeyField([Account](#), to_field='ID', primary_key=True, on_delete='CASCADE')
- **HashVal** = peewee.CharField()
- **HashKey** = peewee.FixedCharField(10)

4.3.1 Detailed Description

SQLite table to store hash keys and hash values.

use peewee orm library to create a table class that stores hash values and hash keys in a database. This table is not accessible via the application.

Parameters

| | |
|----------------|---|
| <i>Eid</i> | Encrypted Password ID and Foreign key from Account ID |
| <i>HashVal</i> | Hashed value of Password |
| <i>HashKey</i> | Key to Decrypt Password |

The documentation for this class was generated from the following file:

- [database.py](#)

4.4 database.BaseModel.Meta Class Reference

Static Public Attributes

- **database** = db

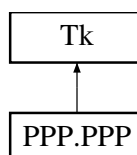
The documentation for this class was generated from the following file:

- [database.py](#)

4.5 PPP.PPP Class Reference

An ADT that represents the GUI.

Inheritance diagram for PPP.PPP:



Public Member Functions

- def `__init__` (self, args)
PPP constructor.
- def `showLogin` (self)
Log In Screen.
- def `matchPassword` (self, frame, kwargs)
Match Password.
- def `showCreateMP` (self)
Master Password Creation Screen.
- def `checkMP` (self, frame, kwargs)
Check Master Password.
- def `showEntry` (self, frame, detailFrame)
Show entry.
- def `showPWPage` (self, args)
Password Management Screen.
- def `addEntry` (self, scrollFrame, canvas, detailFrame, pwd)
Add entry to database and display in scrollbar frame.
- def `viewDetails` (self, idnum, frame)
Displays details of entry.

Public Attributes

- **accounts**
- **img**

4.5.1 Detailed Description

An ADT that represents the GUI.

4.5.2 Constructor & Destructor Documentation

4.5.2.1 `__init__()`

```
def PPP.PPP.__init__ (
    self,
    args )
```

PPP constructor.

Initializes a **PPP** GUI object using a variable argument list

Parameters

| | |
|--------------|---|
| *args | A variable argument list that contains information that should be dsplayed in GUI |
|--------------|---|

4.5.3 Member Function Documentation

4.5.3.1 addEntry()

```
def PPP.PPP.addEntry (
    self,
    scrollFrame,
    canvas,
    detailFrame,
    pwd )
```

Add entry to database and display in scrollbar frame.

Adds entry to the database and the display

Parameters

| | |
|--------------------|--|
| <i>scrollFrame</i> | The frame on the left which displays the entries as buttons |
| <i>detailFrame</i> | The frame on the right which displays details of each entry |
| <i>*pwd</i> | Variable list of entries from the user when he/she adds an entry |

4.5.3.2 checkMP()

```
def PPP.PPP.checkMP (
    self,
    frame,
    kwargs )
```

Check Master Password.

Checks if password meets criteria for master password creation

Parameters

| | |
|-----------------|--|
| <i>frame</i> | The frame which called the method, so it can be updated to show something else upon entering a satisfactory password |
| <i>**kwargs</i> | A variable argument list, in this case takes the label that tells you if incorrect password and entry from user |

4.5.3.3 matchPassword()

```
def PPP.PPP.matchPassword (
    self,
```

```
        frame,  
        kwargs )
```

Match Password.

Checks if password matches master password stored in database

Parameters

| | |
|-----------------|---|
| <i>frame</i> | The frame which called the method, so it can be updated to show something else upon entering the correct password |
| <i>**kwargs</i> | A variable argument list, in this case takes the label that tells you if incorrect password and entry from user |

4.5.3.4 showCreateMP()

```
def PPP.PPP.showCreateMP (  
    self )
```

Master Password Creation Screen.

Displays the master password creation frame

4.5.3.5 showEntry()

```
def PPP.PPP.showEntry (  
    self,  
    frame,  
    detailFrame )
```

Show entry.

Shows entries that already exists as a button on the left scrolling frame

Parameters

| | |
|--------------------|---|
| <i>frame</i> | The frame that displays button |
| <i>detailFrame</i> | The frame that will show further details if button on left frame is clicked |

4.5.3.6 showLogIn()

```
def PPP.PPP.showLogIn (  
    self )
```

Log In Screen.

Displays the log in frame

4.5.3.7 showPWPage()

```
def PPP.PPP.showPWPage (
    self,
    args )
```

Password Management Screen.

Where user can add and view account information

Parameters

| | |
|--------------|--------------------------|
| <i>*args</i> | A variable argument list |
|--------------|--------------------------|

4.5.3.8 viewDetails()

```
def PPP.PPP.viewDetails (
    self,
    idnum,
    frame )
```

Displays details of entry.

Displays details of entry (type, name, username, password), called when button for entry is clicked

Parameters

| | |
|--------------|--|
| <i>idnum</i> | The id number of the entry that was clicked |
| <i>frame</i> | The frame in which to display the details on |

The documentation for this class was generated from the following file:

- [PPP.py](#)

Chapter 5

File Documentation

5.1 Constants.py File Reference

The constants being used in the GUI file (fonts, colours)

Variables

- string **Constants.BGC** = "#cccccc"
- string **Constants.BG** = "#383A39"
- string **Constants.FG** = "#A1DBCD"
- tuple **Constants.LARGE** = ("Helvetica", 16)
- string **Constants.screen_size** = "1080x840"
- string **Constants.eye** = "eye.gif"

5.1.1 Detailed Description

The constants being used in the GUI file (fonts, colours)

Author

Suhavi Sandhu

Date

November 10, 2017

5.2 database.py File Reference

PPP_database

Classes

- class [database.BaseModel](#)
Base Model for database connection.
- class [database.BaseModel.Meta](#)
- class [database.Account](#)
SQLite table to store passwords.
- class [database.Encrypt](#)
SQLite table to store hash keys and hash values.

Functions

- def [database.CreateTables](#) ()
Instantiate new empty tables.
- def [database.DropTable](#) ()
Delete tables.
- def [database.Insert](#) (Id, N, T, U, Hv, Hk)
Insert new [Account](#) Instance and [Encrypt](#) Instance.
- def [database.GetId](#) (id_)
search tables with AcclId
- def [database.GetT](#) (Atype)
Get Table Rows with [Account](#) Type.
- def [database.GetN](#) (Aname)
Get Table Row with [Account](#) name.
- def [database.Delete](#) (id_)
Delete Table Row with ID.
- def [database.UpdateU](#) (Aid, U)
Update Table Row with ID.
- def [database.UpdateP](#) (Aid, Hv)
Update Password with ID.

Variables

- **database.db** = peewee.SqliteDatabase('pppDatabase.db')

5.2.1 Detailed Description

PPP_database

Author

Joseph Lu, luy89

Date

20/10/2017

5.2.2 Function Documentation

5.2.2.1 CreateTable()

```
def database.CreateTables ( )
```

Instantiate new empty tables.

Encrypt Table should also be reset when Account is reset

5.2.2.2 Delete()

```
def database.Delete (
    id_ )
```

Delete Table Row with ID.

Parameters

| | |
|-----------|------------|
| <i>id</i> | Account ID |
|-----------|------------|

5.2.2.3 DropTables()

```
def database.DropTable ( )
```

Delete tables.

Encrypt Table should also be reset when Account is reset

5.2.2.4 GetId()

```
def database.GetId (
    id_ )
```

search tables with AcclId

Parameters

| | |
|-----------|------------|
| <i>Id</i> | Account Id |
|-----------|------------|

5.2.2.5 GetN()

```
def database.GetN (
    Aname )
```

Get Table Row with Account name.

Parameters

| | |
|--------------|--------------|
| <i>Aname</i> | Account Name |
|--------------|--------------|

5.2.2.6 GetT()

```
def database.GetT (
    Atype )
```

Get Table Rows with Account Type.

Parameters

| | |
|--------------|--------------|
| <i>Atype</i> | Account type |
|--------------|--------------|

5.2.2.7 Insert()

```
def database.Insert (
    Id,
    N,
    T,
    U,
    Hv,
    Hk )
```

Insert new Account Instance and Encrypt Instance.

Parameters

| | |
|-----------|--------------|
| <i>N</i> | Account Name |
| <i>T</i> | Account Type |
| <i>U</i> | username |
| <i>Hv</i> | Hash Value |
| <i>Hk</i> | Hash Key |

5.2.2.8 UpdateP()

```
def database.UpdateP (
    Aid,
    Hv )
```

Update Password with ID.

Parameters

| | |
|------------|---------------------------|
| <i>Aid</i> | Account Id (Encrypted ID) |
| <i>Hv</i> | new Hash Value |

5.2.2.9 UpdateU()

```
def database.UpdateU (
    Aid,
    U )
```

Update Table Row with ID.

Parameters

| | |
|------------|----------------|
| <i>Aid</i> | Account Id |
| <i>U</i> | new Username |
| <i>Hv</i> | new Hash Value |

5.3 Encrypt.py File Reference

Password Encryption

Functions

- def [Encrypt.generKey](#) ()
This function generates a unique key (for encoding user passwords) using Python's Fernet library.
- def [Encrypt.cryptEncode](#) (key, passw)
This function uses a key to encrypt an input string.
- def [Encrypt.cryptDecode](#) (key, encrypted)
This function uses the saved key to decrypt the encrypted user password stored in the database.

5.3.1 Detailed Description

Password Encryption

Author

Shabana Dhayananth

Date

October 15, 2017

5.3.2 Function Documentation**5.3.2.1 cryptDecode()**

```
def Encrypt.cryptDecode (
    key,
    encrypted )
```

This function uses the saved key to decrypt the encrypted user password stored in the database.

Parameters

| | |
|----------------------|---|
| <i>key,encrypted</i> | refer to the key that was used to encript the password and the encrypted password |
|----------------------|---|

Returns

decrypted password

5.3.2.2 cryptEncode()

```
def Encrypt.cryptEncode (
    key,
    passw )
```

This function uses a key to encrypt an input string.

Fernet uses symmetric encryption on the input key

Parameters

| | |
|------------------|---|
| <i>key,passw</i> | refer to the key to be used to encrypt and the password to be encrypted |
|------------------|---|

Returns

encrypted password

5.3.2.3 generKey()

```
def Encrypt.generKey ( )
```

This function generates a unique key (for encoding user passwords) using Python's Fernet library.

key derived from a string that is run through the kdf (key derivation function)

Returns

key that will be used to encode the user passwords (32 bytes)

5.4 GenPassword.py File Reference

Generate Random Password

Functions

- def [GenPassword.genPass](#) ()
This function generates a random password consisting of upper case, lower case alphanumeric characters.
- def [GenPassword.genPassCrypt](#) ()
This function generates a random password consisting of upper case, lower case alphanumeric characters.

5.4.1 Detailed Description

Generate Random Password

Author

Shabana Dhayananth

Date

October 27, 2017

5.4.2 Function Documentation

5.4.2.1 genPass()

```
def GenPassword.genPass ( )
```

This function generates a random password consisting of upper case, lower case alphanumeric characters.

default random number generator's sequences can be reproduced, in case `SystemRandom()` is not available on user system

Returns

random password consisting of 8 characters

5.4.2.2 genPassCrypt()

```
def GenPassword.genPassCrypt ( )
```

This function generates a random password consisting of upper case, lower case alphanumeric characters.

Same as [genPass\(\)](#) but uses `SystemRandom()` to generate random numbers so sequences are not reproducible

Returns

random password consisting of 8 characters

5.5 inactivity.py File Reference

Tracks how long user is inactive.

Functions

- def [inactivity.inactive](#) ()
Does something when user is inactive
- def [inactivity.reset_timer](#) (app, event=None)
resets the timer
- def [inactivity.config_reset](#) (app)
resets the timer

5.5.1 Detailed Description

Tracks how long user is inactive.

Author

Suhavi Sandhu

Date

November 10, 2017

5.5.2 Function Documentation

5.5.2.1 config_reset()

```
def inactivity.config_reset (  
    app )
```

resets the timer

Parameters

| | |
|------------|---------|
| <i>app</i> | The GUI |
|------------|---------|

5.5.2.2 `reset_timer()`

```
def inactivity.reset_timer (
    app,
    event = None )
```

resets the timer

Parameters

| | |
|--------------|----------|
| <i>app</i> | The GUI |
| <i>event</i> | optional |

5.6 PPP.py File Reference

The graphical user interface for a password manager.

Classes

- class `PPP.PPP`
An ADT that represents the GUI.

Variables

- `PPP.app = PPP()`

5.6.1 Detailed Description

The graphical user interface for a password manager.

Author

Suhavi Sandhu

Date

November 10, 2017

5.7 PWChecking.py File Reference

Check Passwords

Functions

- def `PWChecking.checkMP` (password)
Checks master password at creation.
- def `PWChecking.checkLogIn` (entered, actual)
Checks master password at login.

5.7.1 Detailed Description

Check Passwords

Author

Suhavi Sandhu

Date

November 10, 2017

5.7.2 Function Documentation

5.7.2.1 `checkLogIn()`

```
def PWChecking.checkLogIn (
    entered,
    actual )
```

Checks master password at login.

Verifies that the entered password matches the actual

Parameters

| | |
|----------------|----------------------------------|
| <i>entered</i> | The password entered by the user |
| <i>actual</i> | The real master password |

5.7.2.2 checkMP()

```
def PWChecking.checkMP (
    password )
```

Checks master password at creation.

Verifies that the password meets criteria

Parameters

| | |
|-----------------|------------------------------------|
| <i>password</i> | The password that is being checked |
|-----------------|------------------------------------|

Index

- `__init__`
 - PPP::PPP, 10
- `addEntry`
 - PPP::PPP, 11
- `checkLogIn`
 - PWChecking.py, 24
- `checkMP`
 - PPP::PPP, 11
 - PWChecking.py, 24
- `config_reset`
 - inactivity.py, 22
- `Constants.py`, 15
- `CreateTables`
 - database.py, 17
- `cryptDecode`
 - Encrypt.py, 20
- `cryptEncode`
 - Encrypt.py, 20
- `database.Account`, 7
- `database.BaseModel`, 8
- `database.BaseModel.Meta`, 9
- `database.Encrypt`, 8
- `database.py`, 15
 - `CreateTables`, 17
 - `Delete`, 17
 - `DropTables`, 17
 - `GetId`, 17
 - `GetN`, 17
 - `GetT`, 18
 - `Insert`, 18
 - `UpdateP`, 18
 - `UpdateU`, 19
- `Delete`
 - database.py, 17
- `DropTables`
 - database.py, 17
- `Encrypt.py`, 19
 - `cryptDecode`, 20
 - `cryptEncode`, 20
 - `generKey`, 20
- `genPass`
 - GenPassword.py, 21
- `genPassCrypt`
 - GenPassword.py, 21
- `GenPassword.py`, 21
 - `genPass`, 21
 - `genPassCrypt`, 21
 - `generKey`
 - Encrypt.py, 20
 - `GetId`
 - database.py, 17
 - `GetN`
 - database.py, 17
 - `GetT`
 - database.py, 18
 - `inactivity.py`, 22
 - `config_reset`, 22
 - `reset_timer`, 23
 - `Insert`
 - database.py, 18
 - `matchPassword`
 - PPP::PPP, 11
 - PPP.PPP, 9
 - PPP.py, 23
 - PPP::PPP
 - `__init__`, 10
 - `addEntry`, 11
 - `checkMP`, 11
 - `matchPassword`, 11
 - `showCreateMP`, 12
 - `showEntry`, 12
 - `showLogIn`, 12
 - `showPWPage`, 12
 - `viewDetails`, 13
 - PWChecking.py, 24
 - `checkLogIn`, 24
 - `checkMP`, 24
 - `reset_timer`
 - inactivity.py, 23
 - `showCreateMP`
 - PPP::PPP, 12
 - `showEntry`
 - PPP::PPP, 12
 - `showLogIn`
 - PPP::PPP, 12
 - `showPWPage`
 - PPP::PPP, 12
 - `UpdateP`
 - database.py, 18
 - `UpdateU`
 - database.py, 19

viewDetails
 PPP::PPP, [13](#)