

K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)

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Chapter 1: Overview

1.1 Problem definition

With increasing need of protecting ourselves from the financial risks due to accidents and other incidents, it is important to purchase a car insurance policy. Also, maintaining policies in paper format is indeed a hassle. It causes problems as they may be kept in an unorganised manner and it may be time consuming to search for a particular policy. The system aims to generate an insurance policy according to various factors and conditions and keep them in an organised manner, so that users can keep track of the information regarding the policies they have purchased.

1.2 Features

The application of car insurance policy generator has the following features:

- Register
- Login
- Profile
- View policies
- Generate policy
- Download policy

The features have been described in detail in the implementation part of the report.

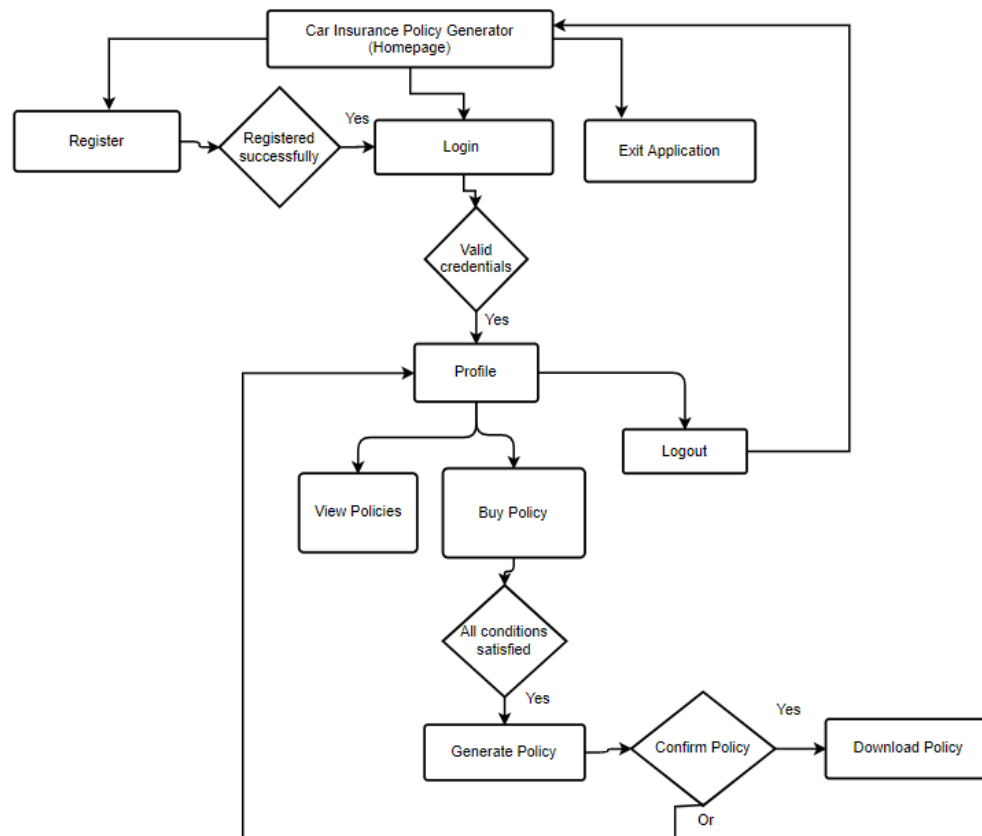
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1.3 Future Scope

- The module of making a claim can be included
- Change profile details feature can be added
- Forgot password feature can be added
- Email verification feature can be added while registering
- The GUI application can be developed into a website and more features can be included such as making payment of premium amount

Chapter 2: Project Design

2.1 Flow Diagram



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2.2 Software used

Software

- VS Code
- cmd
- Visual Paradigm

Additionally, these modules and libraries were used or installed

- dateutil
- fpdf2
- MySQL connector
- tkinter
- uuid
- re
- datetime
- math
- time

The details of this can be found in the requirements.txt file in the GitHub repository

Chapter 3: Implementation

3.1 Working

- The car insurance policy is generated on the basis of various conditions which the user enters.
- The instalment schedule may be quarterly, half-yearly or yearly
- The policy may be for self-damage, third-party damage or both
- The start date of the instalment schedule is one week after the date the policy is purchased and expiration date is start date + 1 year – 1 day
- The premium calculation is based on the following factors:
 - Gender
 - Year of Registration
 - Age
 - City
 - Cubic Capacity
 - Price of car
- The tables containing the parameter and their factors are mentioned below:

Gender	Factor
Male	0.0020
Female	0.0015

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Year of Registration	Factor
2013 – 2016	0.0030
2017 – 2019	0.0020
2020 - 2021	0.0010

City	Factor
Mumbai	0.0040
Pune	0.0035
Nagpur	0.0030
Aurangabad	0.0025
Nashik	0.0020

Capacity(in cc)	Factor
800 - 999	0.0010
1000 - 1199	0.0020
1200 - 1300	0.0030

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Price of car	Factor
500000 - 999999	0.0010
1000000 - 1999999	0.0020
2000000-9999999	0.0030

Age (in years)	Factor
20 - 39	0.0020
40 - 59	0.0015
60 - 99	0.0030

- According to the parameters entered by the users, the respective factors are added to find the factor for premium.
- According to these tables, it can be noted that an error message will be shown and policy will be not generated if the user enters any value that is not present within the range of parameters.
- Depending on the type of damage, the premium is calculated as follows:

DAMAGE	PREMIUM
Self-damage	$PRICE * FACTOR * 0.8$
Third party damage	$PRICE * FACTOR$
Both	$PRICE * FACTOR * 1.3$

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The insurance amount offered is calculated as follows:

DAMAGE	INSURANCE
Self-damage	PRICE * 0.2
Third party damage	PRICE * 0.3

- If the type of damage is both, then both the values of self-damage and third-party insurance are applied.
- After the premium and insurance are calculated, the instalment schedule is generated according to the type i.e., yearly, half-yearly or quarterly

3.2 Database

MySQL was used to implement database access in this project

The tables of database User were designed as follows:

Table: userdata

Field	Datatype
username	varchar – primary key
password	varchar
name	varchar
email	varchar - unique

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Table: policy

Field	Datatype
username	foreign key (from userdata table)
policy_id	varchar – primary key
gender	enum('Male','Female')
age	tinyint unsigned
reg_year	int unsigned
city	enum('Mumbai','Pune','Nagpur','Aurangabad','Nashik')
cc_capacity	int unsigned
price	int unsigned
date_of_policy	date
installment	enum('Yearly','Half-Yearly','Quarterly')
damage	enum('Self','Third Party','Both')
premium	float
self	float
thirdparty	float

Table: genderfactor

Field	Datatype
gender	enum('Male','Female') – primary key
factor	float(5,4)

Table: cityfactor

Field	Datatype
city	enum('Mumbai','Pune','Nagpur','Aurangabad','Nashik') - primary key
factor	float(5,4)

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Table: agefactor

Field	Datatype
age_range_id	int , autoincrement – primary key
min	tinyint unsigned unique
max	tinyint unsigned unique
factor	float(5,4) unique

Table: yearfactor

Field	Datatype
year_range_id	int , autoincrement – primary key
min	tinyint unsigned unique
max	tinyint unsigned unique
factor	float(5,4) unique

Table: capacityfactor

Field	Datatype
cc_range_id	int , autoincrement – primary key
min	tinyint unsigned unique
max	tinyint unsigned unique
factor	float(5,4) unique

Table: pricefactor

Field	Datatype
price_range_id	int , autoincrement – primary key
min	tinyint unsigned unique
max	tinyint unsigned unique
factor	float(5,4) unique

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3.3 Functions implemented

Register:

The user is given the option to register if he does not have an account and wishes to create one. If the conditions for username, password and email are satisfied and user has entered all the required details, the registration is successful.

Login:

The user can login to the account by entering valid credentials and will be navigated to the profile page after successful login

Profile:

The profile page displays the user's basic details entered during registration and gives the user three options: view policies, buy policy and logout

View policies:

If the user has not purchased any policy and this option is selected, then an error message is shown. If the user has purchased any number of policies, the details of those policies will be displayed.

Generate policy:

On selecting this option, the user can enter various details such as personal details and car details. If all the policy conditions are satisfied, the policy is generated according to these parameters. If the user confirms that he wants to buy the policy, he is taken to the next window where he can download the policy and the policy is added to his profile.

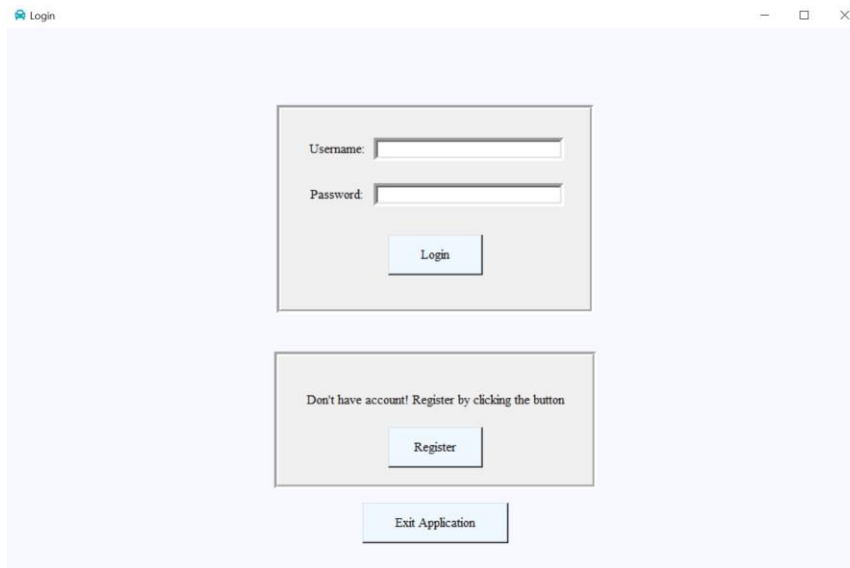
Download:

After the user confirms that he wants to buy the policy, the confirmed policy details are shown and the user can download the policy in pdf format.

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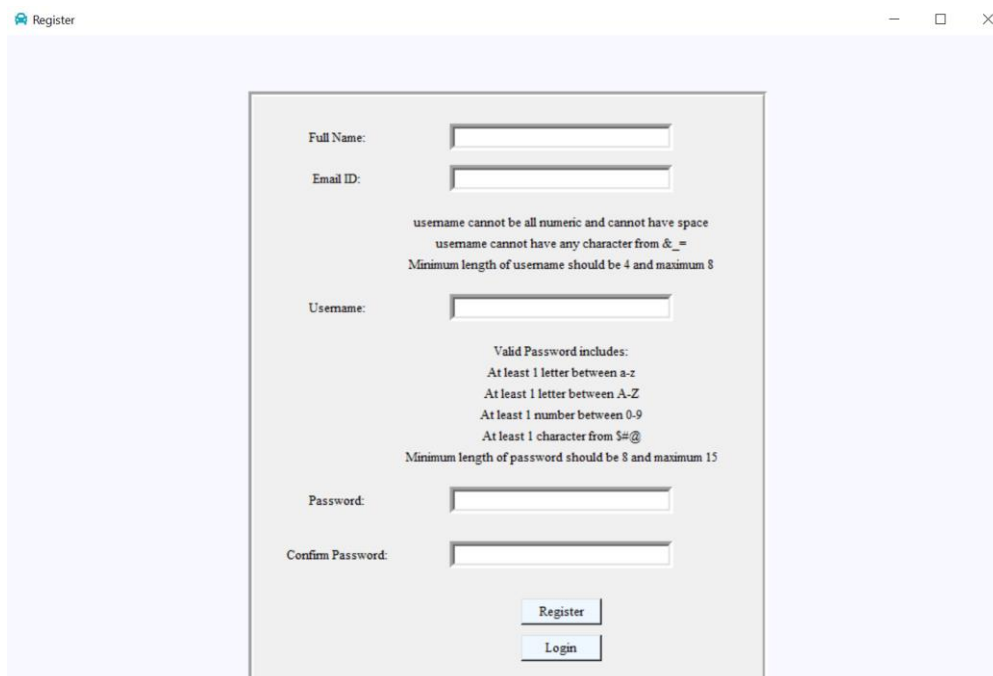
3.3 User Interface

Login window



The Login window is a simple interface with a light blue background. It features a central white box containing the login form. The form has two input fields: 'Username:' and 'Password:'. Below the password field is a 'Login' button. Below the login form is another white box containing the text 'Don't have account! Register by clicking the button' and a 'Register' button. At the bottom of the window is an 'Exit Application' button.

Register window



The Register window is a simple interface with a light blue background. It features a central white box containing the registration form. The form has three input fields: 'Full Name:', 'Email ID:', and 'Username:'. Below the 'Username:' field is a 'Valid Password includes:' section with the following requirements: 'At least 1 letter between a-z', 'At least 1 letter between A-Z', 'At least 1 number between 0-9', and 'At least 1 character from \$#@'. Below this section is a 'Minimum length of password should be 8 and maximum 15' note. Below the password field is a 'Confirm Password:' field. At the bottom of the form are 'Register' and 'Login' buttons.

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User Information (Profile) window

Buy Policy window

Buy Policy

Age(In Years):

Year of registration:

Cubic Capacity:

Price(In Rupees):

Select Gender: ☐ Male ☐ Female

Select Type Of Damage: ☐ Self ☐ Third Party ☐ Both

City:

Installment Type: ☐ Yearly ☐ Half-yearly ☐ Quaterly

Policy Details window

Policy Details

Personal Details	
Name: Isha Dhabalia	Email ID: isha.dhabalia@somaiya.edu
Gender: Female	Age: 20 years
Car Details	
Year Of Registration: 2017	Price of car: Rs. 700000
City: Mumbai	Vehicle CC: 1000
Policy Details	
Premium Amount: Rs. 11375.00	
Self Damage insurance: Rs. 140000.00	Third Party Damage insurance: Rs. 210000.00
Payment Date:	Cost:
10-05-2021	Rs. 2843.75
10-08-2021	Rs. 2843.75
10-11-2021	Rs. 2843.75
10-02-2022	Rs. 2843.75

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Confirmation Window

Confirmation Window

Policy ID:	1297138
Premium:	Rs. 11375.0
Insured Amount	
Self Damage:	Rs. 140000.0
Third party:	Rs. 210000.0

Download Policy

Profile

Downloaded policy (Pdf)

1297138.pdf

File | C:/Users/Isha/car_project/1297138.pdf

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Car Insurance Policy

Personal Details

Name: Isha Dhabalia	Email ID: isha.dhabalia@somaiya.edu
Gender: Female	Age: 20 years

Car Details

Year Of Registration: 2017	Price of car: Rs. 700000
City: Mumbai	Vehicle CC: 1000

Policy Details

Policy ID: 1297138	Premium Amount: Rs. 11375.0
Self Damage insurance: Rs. 140000.0	Third Party Damage insurance: Rs. 210000.0
Policy Active Date: 10-05-2021	Policy Expiration Date: 09-05-2022

Installment Schedule

Payment Date:	Cost:
10-05-2021	Rs. 2843.75
10-08-2021	Rs. 2843.75
10-11-2021	Rs. 2843.75
10-02-2022	Rs. 2843.75

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View Policies Window

View Policies

Personal Details	
Name: Isha Dhabalia	Email ID: isha.dhabalia@somaiya.edu
Gender: Female	Age: 20 years
Car Details	
Year Of Registration: 2017	Price of car: Rs. 700000
City: Mumbai	Vehicle CC: 1000
Policy Details	
Policy ID: 1297138	Premium Amount: Rs. 11375.00
Self Damage insurance: Rs. 140000.00	Third Party Damage insurance: Rs. 210000.00
Policy Active Date: 10-05-2021	Policy Expiration Date: 09-05-2022
Payment Date:	
10-05-2021	Cost: Rs. 2843.75
10-08-2021	Rs. 2843.75
10-11-2021	Rs. 2843.75
10-02-2022	Rs. 2843.75

Profile

Chapter 4: GitHub Implementation

The name of the repository is: car_insurance

Link to GitHub repository: https://github.com/ishadhabalia/car_insurance

Chapter 5: References

- [1] <https://stackoverflow.com/>
- [2] https://www.w3schools.com/python/python_mysql_getstarted.asp
- [3] <https://pypi.org/project/fpdf/>
- [4] <https://pypi.org/project/python-dateutil/>
- [5] https://www.tutorialspoint.com/python/python_gui_programming.htm
- [6] <https://docs.python.org/3/library/tkinter.html>



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