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Airline Booking System Using Python

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AIRLINE BOOKING SYSTEM USING PYTHON

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ABSTRACT:

This project helps to build a interface between the airline companies and the passengers so that they can book tickets from anywhere in the world.The system should ask for the travel from and travel to cities.For booking the customers has to sign-up or sign-in and enter the passengers details.It is a simple airline railway reservation system which uses TKinter to build up a GUI and SQLite database to store the sign-up information of a passenger.The travel from and to city should be different otherwise it would show an error.It uses different modules of TKniter to build a reservation system using button,label, message box, entry, frames and title.When the program runs,it will show a frame which asks about departure and arrival City,and if the customer wants to book he can proceed with the sign-in and sign-up.

INTRODUCTION:

“Airline Reservation System” project is an attempt to stimulate the basic concepts of airline reservation system. The system enables the customer to do the things such as search for airline flights for two travel cities on a specified date, choose a flight based on the details, reservation of flight and cancellation of reservation.

The system allows the airline passenger to search for flights that are available between the two travel cities, namely the “Departure city” and “Arrival city” for a particular departure and arrival dates. The system displays all the flight’s details such as flight no, name, price and duration of journey etc.

After search the system display list of available flights and allows customer to choose a particular flight. Then the system checks for

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the availability of seats on the flight. If the seats are available then the system allows the passenger to book a seat. Otherwise it asks the user to choose another flight.

To book a flight the system asks the customer to enter his details such as name, address, city, state, credit card number and contact number. Then it checks the validity of card and book the flight and update the airline database and user database. The system also allows the customer to cancel his/her reservation, if any problem occurs.

The main purpose of this software is to reduce the manual errors involved in the airline reservation process and make it convenient for the customers to book the flights as when they require such that they can utilize this software to make reservations, modify reservations or cancel a particular reservation.

PYTHON:

Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntactical constructions than other languages.

- Python is Interpreted– Python is processed at runtime by the interpreter. You do not need to compile your program before executing it. This is similar to PERL and PHP.
- Python is Interactive – You can actually sit at a Python prompt and interact with the interpreter directly to write your programs.
- Python is Object-Oriented– Python supports Object-Oriented style or technique of programming that encapsulates code within objects.
- Python is a Beginner's Language– Python is a great

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language for the beginner-level programmers and supports the development of a wide range of applications from simple text processing to WWW browsers to games.

History of Python:

Python was developed by Guido van Rossum in the late eighties and early nineties at the National Research Institute for Mathematics and Computer Science in the Netherlands.

Python is derived from many other languages, including ABC, Modula-3, C, C++, Algol-68, SmallTalk, and Unix shell and other scripting languages.

Python is copyrighted. Like Perl, Python source code is now available under the GNU General Public License (GPL).

Python is now maintained by a core development team at the institute, although Guido van Rossum still holds a vital role in directing its progress.

Python Features:

Python's features include:

- Easy-to-learn – Python has few keywords, simple structure, and a clearly defined syntax. This allows the student to pick up the language quickly.

- Easy-to-read – Python code is more clearly defined and visible to the eyes.

Easy-to-maintain – Python's source code is fairly easy-to-maintain.

- A broad standard library – Python's bulk of the library is very portable and cross-platform compatible on UNIX, Windows, and Macintosh.

- Interactive Mode – Python has support for an interactive mode which allows interactive testing and debugging of snippets of code.

- Portable – Python can run on a wide variety of hardware platforms and has the same interface on all

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platforms.

- Extendable – You can add low-level modules to the Python interpreter. These modules enable programmers to add to or customize their tools to be more efficient.
- Databases – Python provides interfaces to all major commercial databases.
- GUI Programming – Python supports GUI applications that can be created and ported to many system calls, libraries and windows systems, such as Windows MFC, Macintosh, and the X Window system of Unix.
- Scalable – Python provides a better structure and support for large programs than shell scripting.

Apart from the above-mentioned features, Python has a big list of good features, few are listed below –

- It supports functional and structured programming methods as well as OOP.
- It can be used as a scripting language or can be compiled to byte-code for building large applications.
- It provides very high-level dynamic data types and supports dynamic type checking.
- It supports automatic garbage collection.
- It can be easily integrated with C, C++, COM, ActiveX, CORBA, and Java.

Python is available on a wide variety of platforms including Linux and Mac OS X. Let's understand how to set up our Python environment.

Local Environment Setup:

Open a terminal window and type "python" to find out if it is already installed and which version is installed.

- Unix (Solaris, Linux, FreeBSD, AIX, HP/UX, SunOS, IRIX, etc.)

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- Win 9x/NT/2000
- Macintosh (Intel, PPC, 68K)
- OS/2
- DOS (multiple versions)
- PalmOS
- Nokia mobile phones
- Windows CE
- Acorn/RISC OS
- BeOS
- Amiga
- VMS/OpenVMS
- QNX
- VxWorks
- Psion
- Python has also been ported to the Java and .NET virtual machines

Getting Python:

The most up-to-date and current source code, binaries, documentation, news, etc., is available on the official website of Python https://www.python.org/

You can download Python documentation from https://www.python.org/doc/. The documentation is available in HTML, PDF, and PostScript formats.

Installing Python:

Python distribution is available for a wide variety of platforms. You need to download only the binary code applicable for your platform and install Python.

If the binary code for your platform is not available, you need a C compiler to compile the source code manually. Compiling the source code offers more flexibility in terms of choice of features that you require in your installation.

Here is a quick overview of installing Python on various platforms

Windows Installation:

Here are the steps to install Python on Windows machine.

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Open a Web browser and go to https://www.python.org/downloads/.

Follow the link for the Windows installer python-XYZ.msi file where XYZ is the version you need to install.

To use this installer python-XYZ.msi, the Windows system must support Microsoft Installer 2.0. Save the installer file to your local machine and then run it to find out if your machine supports MSI.

Run the downloaded file. This brings up the Python install wizard, which is really easy to use. Just accept the default settings, wait until the install is finished, and you are done.

Setting up PATH:

Programs and other executable files can be in many directories, so operating systems provide a search path that lists the directories that the OS searches for executables.

The path is stored in an environment variable, which is a named string maintained by the operating system. This variable contains information available to the command shell and other programs.

The path variable is named as PATH in Unix or Path in Windows (Unix is case sensitive; Windows is not).

In Mac OS, the installer handles the path details. To invoke the Python interpreter from any particular directory, you must add the Python directory to your path.

Setting path at Windows:

To add the Python directory to the path for a particular session in Windows –

At the command prompt – type path %path%;C:\Python and press Enter.

Note – C:\Python is the path of the Python directory.

DJANGO:

As you already know, Django is a Python web framework. And like

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most modern framework, Django supports the MVC pattern. First let's see what is the Model-View-Controller (MVC) pattern, and then we will look at Django's specificity for the Model-View-Template (MVT) pattern.

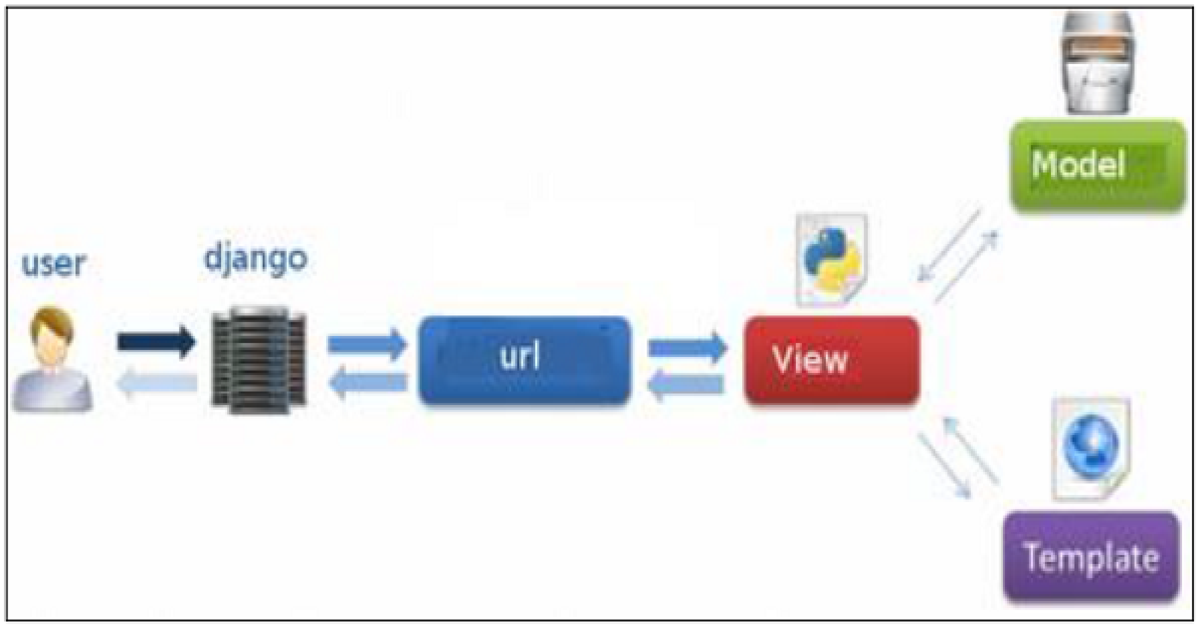
MVC Pattern:

When talking about applications that provides UI (web or desktop), we usually talk about MVC architecture. And as the name suggests, MVC pattern is based on three components: Model, View, and Controller.

DJANGO MVC - MVT Pattern:

The Model-View-Template (MVT) is slightly different from MVC. In fact the main difference between the two patterns is that Django itself takes care of the Controller part (Software Code that controls the interactions between the Model and View), leaving us with the template. The template is a HTML file mixed with Django Template Language (DTL).

The following diagram illustrates how each of the components of the MVT pattern interacts with each other to serve a user request –



The developer provides the Model, the view and the template then just maps it to a URL and Django does the magic to serve it to the

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user.

Django development environment consists of installing and setting up Python, Django, and a Database System. Since Django deals with web application, it's worth mentioning that you would need a web server setup as well.

- URLs: While it is possible to process requests from every single URL via a single function, it is much more maintainable to write a separate view function to handle each resource. A URL mapper is used to redirect HTTP requests to the appropriate view based on the request URL. The URL mapper can also match particular patterns of strings or digits that appear in a URL and pass these to a view function as data.
- View: A view is a request handler function, which receives HTTP requests and returns HTTP responses. Views access the data needed to satisfy requests via models, and delegate the formatting of the response to templates.
- Models: Models are Python objects that define the structure of an application's data, and provide mechanisms to manage (add, modify, delete) and query records in the database.
- Templates: A template is a text file defining the structure or layout of a file (such as an HTML page), with placeholders used to represent actual content. A view can dynamically create an HTML page using an HTML template, populating it with data from a model. A template can be used to define the structure of any type of file; it doesn't have to be HTML!

Installing Django:

Installing Django is very easy, but the steps required for its installation depends on your operating system. Since Python is

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a platform-independent language, Django has one package that works everywhere regardless of your operating system.

You can download the latest version of Django from the link http://www.djangoproject.com/download

GUI [graphical user interface]:

A GUI (graphical user interface) is a system of interactive visual components for computer software. A GUI displays objects that convey information, and represent actions that can be taken by the user. The objects change color, size, or visibility when the user interacts with them.

GUI objects include icons, cursors, and buttons. These graphical elements are sometimes enhanced with sounds, or visual effects like transparency and drop shadows.

A GUI is considered to be more user-friendly than a text-based command-line interface, such as MS-DOS, or the shell of Unix-like operating systems.

The GUI was first developed at Xerox PARC by Alan Kay, Douglas Engelbart, and a group of other researchers in 1981. Later, Apple introduced the Lisa computer with a GUI on January 19, 1983.

How do you pronounce GUI

GUI is pronounced by saying each letter (G-U-I). It sometimes is also pronounced as "gooey."

How does a GUI work?

A GUI uses windows, icons, and menus to carry out commands, such as opening, deleting, and moving files. Although a GUI operating system is primarily navigated using a mouse, a keyboard can also be used via keyboard shortcuts or the arrow keys.

As an example, if you wanted to

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open a program on a GUI system, you would move the mouse pointer to the program's icon and double-click it.

What are the benefits of GUI?

Unlike a command-line operating system or CUI, like Unix or MS-DOS, GUI operating systems are easier to learn and use because commands do not need to be memorized. Additionally, users do not need to know any programming languages. Because of their ease of use and more modern appearance, GUI operating systems have come to dominate today's market.

What are examples of a GUI operating system?

- Microsoft Windows
- Apple System 7 and macOS
- Chrome OS
- Linux variants like Ubuntu using a GUI interface.

Are all operating systems GUI?

No. Early command line operating systems like MS-DOS and even some versions of Linux today have no GUI interface.

What are examples of a GUI interface?

1. GNOME
2. KDE
3. Any Microsoft program, including Word, Excel, and Outlook.
4. Internet browsers, such as Internet Explorer, Chrome, and Firefox.

How does the user interact with a GUI?

A pointing device, such as the mouse, is used to interact with nearly all aspects of the GUI. More modern (and mobile) devices also utilize a touch screen. However, as stated in previous sections, it is

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also possible to navigate a GUI using a keyboard.

Does a GUI require a mouse?

No. Nearly all GUI interfaces, including Microsoft Windows, have options for navigating the interface with a keyboard only.

GUI WITH TKINTER:

Python provides various options for developing graphical user interfaces (GUIs). Most important are listed below.

- Tkinter – Tkinter is the Python interface to the Tk GUI toolkit shipped with Python. We would look this option in this chapter.
- wxPython – This is an open-source Python interface for wxWindows http://wxpython.org.
- JPython – JPython is a Python port for Java which gives Python scripts seamless access to Java class libraries on the local machine http://www.jython.org

There are many other interfaces available, which you can find them on the net.

Tkinter Programming:

Tkinter is the standard GUI library for Python. Python when combined with Tkinter provides a fast and easy way to create GUI applications. Tkinter provides a powerful object-oriented interface to the Tk GUI toolkit.

Creating a GUI application using Tkinter is an easy task. All you need to do is perform the following steps

- Import the Tkinter module.
- Create the GUI application main window.
- Add one or more of the above-mentioned widgets to the GUI application.

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- Enter the main event loop to take action against each event triggered by the user.

Example:

```
#!/usr/bin/python

import Tkinter

top = Tkinter.Tk()

# Code to add widgets will go here...

top.mainloop()
```

Tkinter Widgets:

Tkinter provides various controls, such as buttons, labels and text boxes used in a GUI application. These controls are commonly called widgets.

IDLE[Integreted Development Learning Environment]:

Every Python installation comes with an **Integrated Development and Learning Environment**, which you'll see shortened to IDLE or even IDE. These are a class of applications that help you write code more efficiently. While there are many IDEs for you to choose from, Python IDLE is very bare-bones, which makes it the perfect tool for a beginning programmer.

Python IDLE comes included in Python installations on Windows and Mac. If you're a Linux user, then you should be able to find and download Python IDLE using your package manager. Once you've installed it, you can then use Python IDLE as an interactive interpreter or as a file editor.

An Interactive Interpreter:

The best place to experiment with Python code is in the interactive interpreter, otherwise known as a **shell**. The shell is a basic Read-Eval-Print Loop (REPL). It reads a Python statement, evaluates the result of that statement, and then prints the result on the screen. Then, it loops back to read the next statement.

The Python shell is an excellent

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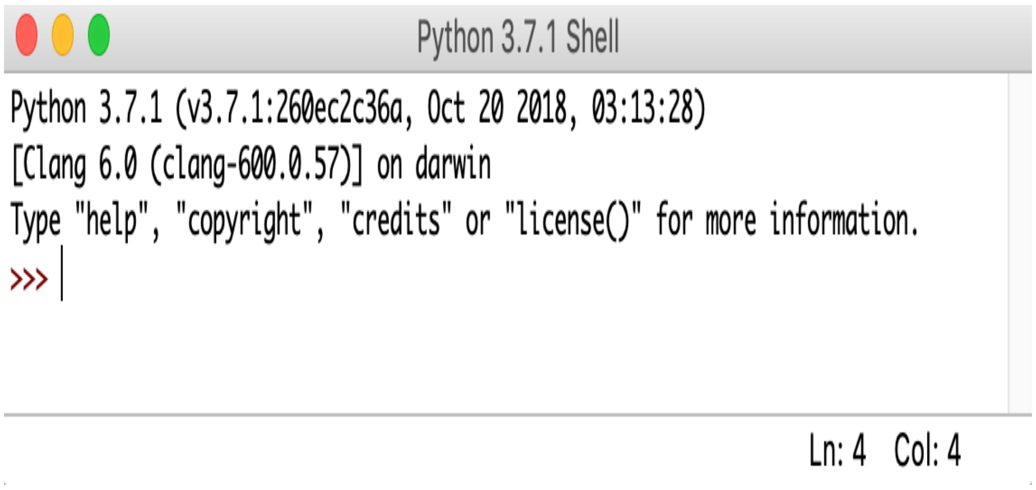
place to experiment with small code snippets. You can access it through the terminal or command line app on your machine. You can simplify your workflow with Python IDLE, which will immediately start a Python shell when you open it.

How to Use the Python IDLE Shell:

The shell is the default mode of operation for Python IDLE. When you click on the icon to open the program, the shell is the first thing that you see:



```
Python 3.7.1 (v3.7.1:260ec2c36a, Oct 20 2018, 03:13:28)
[Clang 6.0 (clang-600.0.57)] on darwin
Type "help", "copyright", "credits" or "license()" for more information.
>>> 
```

This is a blank Python interpreter window. You can use it to start interacting with Python immediately. You can test it out with a short line of code:

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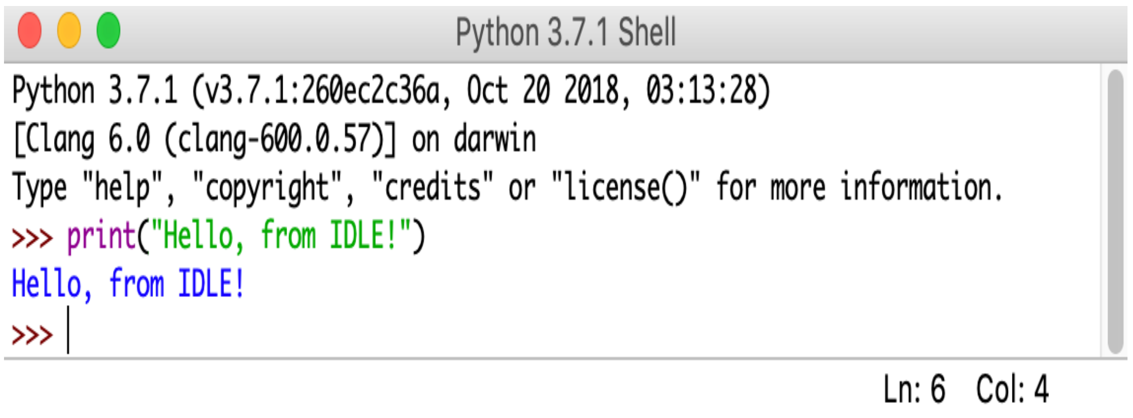
```
Python 3.7.1 (v3.7.1:260ec2c36a, Oct 20 2018, 03:13:28)
[Clang 6.0 (clang-600.0.57)] on darwin
Type "help", "copyright", "credits" or "license()" for more information.
>>> print("Hello, from IDLE!")
Hello, from IDLE!
>>> 
```

Here, you used print() to output the string "Hello, from IDLE!" to your screen. This is the most basic way to interact with Python IDLE. You type in commands one at a time and Python responds with the result of each command.

SQLITE3:

SQLite is a C library that provides a lightweight disk-based database that doesn't require a separate server process and allows accessing the database using a nonstandard variant of the SQL query language. Some applications can use SQLite for internal data storage. It's also possible to prototype an application using SQLite and then port the code to a larger database such as PostgreSQL or Oracle.

The sqlite3 module was written by Gerhard Häring. It provides a SQL interface compliant with the DB-API 2.0 specification described by PEP 249.

Module functions and constants:

sqlite3.version

The version number of this module, as a string. This is not the version of the SQLite library.

sqlite3.version_info

The version number of this module, as a tuple of integers. This is not the version of the SQLite library.

sqlite3.sqlite_version

The version number of the run-time SQLite library, as a string.

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sqlite3.sqlite_version_info

The version number of the run-time SQLite library, as a tuple of integers.

sqlite3.PARSE_DECLTYPES

This constant is meant to be used with the detect_types parameter of the connect() function.

Setting it makes the sqlite3 module parse the declared type for each column it returns. It will parse out the first word of the declared type, i. e. for “integer primary key”, it will parse out “integer”, or for “number(10)” it will parse out “number”. Then for that column, it will look into the converters dictionary and use the converter function registered for that type there.

sqlite3.PARSE_COLNAMES

This constant is meant to be used with the detect_types parameter of the connect() function.

Setting this makes the SQLite interface parse the column name for each column it returns. It will look for a string formed [mytype] in there, and then decide that ‘mytype’ is the type of the column. It will try to find an entry of ‘mytype’ in the converters dictionary and then use the converter function found there to return the value. The column name found in Cursor.description does not include the type,i.e.ifyouuse something
like 'as "Expiration date [datetime]" ' in your SQL, then we will parse out everything until the first '[' for the column name and strip the preceeding space: the column name would simply be “Expiration date”.

sqlite3.connect(database[, timeou t, detect_types, isolation_level, che ck_
same_thread, factory, cached_stat ements, uri])

Opens a connection to the SQLite database file database. By default returns a Connection object, unless a custom factory is given.

database is a path-like object giving the pathname (absolute or relative to the current working directory) of the database file to be opened. You can

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use ":memory:" to open a database connection to a database that resides in RAM instead of on disk.

When a database is accessed by multiple connections, and one of the processes modifies the database, the SQLite database is locked until that transaction is committed.
The timeout parameter specifies how long the connection should wait for the lock to go away until raising an exception. The default for the timeout parameter is 5.0 (five seconds).

sqlite3.**register_converter**(typename, callable)

Registers a callable to convert a bytestring from the database into a custom Python type. The callable will be invoked for all database values that are of the type typename. Confer the parameter detect_types of the connect() function for how the type detection works. Note that typename and the name of the type in your query are matched in case-insensitive manner.

sqlite3.**register_adapter**(type, callable)

Registers a callable to convert the custom Python type type into one of SQLite's supported types. The callable callable accepts as single parameter the Python value, and must return a value of the following types: int, float, str or bytes.

sqlite3.**complete_statement**(sql)

Returns True if the string sql contains one or more complete SQL statements terminated by semicolons. It does not verify that the SQL is syntactically correct, only that there are no unclosed string literals and the statement is terminated by a semicolon.

SYSTEM REQUIREMENTS:

HARDWARE REQUIREMENTS:

- System : Pentium Dual Core.
- Hard Disk : 500 GB.
- Monitor : 15'' LED
- Input Devices : Keyboard,Mouse

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- Ram : 1GB.

- Operating system : Windows 10.
- Coding Language : Python
- Tool : Django, PyCharm

SOFTWARE REQUIREMENTS:

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