Industrial Internship Report on

”MyURLShortener” – an URL Shortening Application

Prepared by

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Executive Summary
This report provides details of the Industrial Internship provided by upskill Campus and The IoT Academy in collaboration with Industrial Partner UniConverge Technologies Pvt Ltd (UCT). This internship was focused on a project/problem statement provided by UCT. We had to finish the project including the report in 6 weeks’ time. My project was to make a URL Shortening Application which will convert a long URL to a shorter one and handle the redirection to the long URL properly when the shorter one is clicked. This internship gave me a very good opportunity to get exposure to Industrial problems and design/implement solution for that. It was an overall great experience to have this internship.

TABLE OF CONTENTS

1 Preface

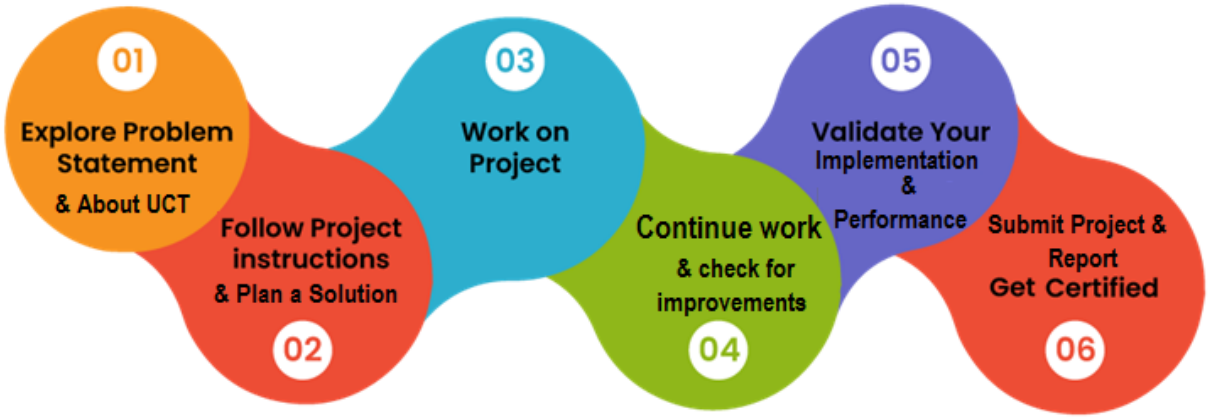
My internship was about making an URL Shortener Application using Python Programming

Getting work experience is an essential aspect of starting your career as a young graduate. The earlier you start gaining experience for your CV, the better. Job experience is not just restricted to an office job with a large organisation. You can get an internship at a small company or get experience by freelancing. Any experience where you use skills that you can transfer to your future career is an excellent addition to your CV. It can help you demonstrate your commitment and capabilities to an employer while highlighting the skills that are both appropriate and transferable to the post you are applying for. An internship is one of the best ways to gain that all-important job experience.

My project was solely based on using Python Development to make a URL Shortening Application which will convert a long URL to a shorter one and handle the redirection to the long URL properly when the shorter one is clicked.

I am thankful to UniConverge Technologies Pvt Ltd for providing me with this opportunity

The Program was planned as --



My learnings and overall experience was very good and I learnt a lot about Python Development, Django Framework and SQLite Database technologies and also about deploying a project.

My message to your juniors and peers will be that they should definitely go for this internship opportunity to enhance their technical skills to a new level.

2 Introduction

2.1 About UniConverge Technologies Pvt Ltd

A company established in 2013 and working in Digital Transformation domain and providing Industrial solutions with prime focus on sustainability and RoI.

For developing its products and solutions it is leveraging various **Cutting Edge Technologies e.g. Internet of Things (IoT), Cyber Security, Cloud computing (AWS, Azure), Machine Learning, Communication Technologies (4G/5G/LoRaWAN), Java Full Stack, Python, Front end** etc.

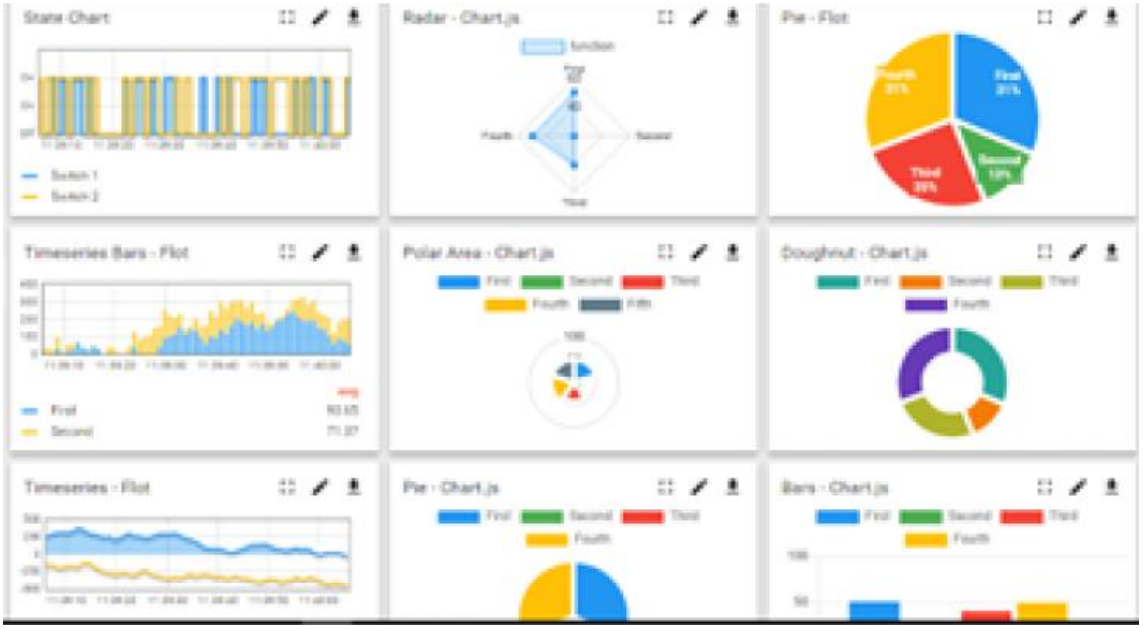
i. UCT IoT Platform (UCT Insight)

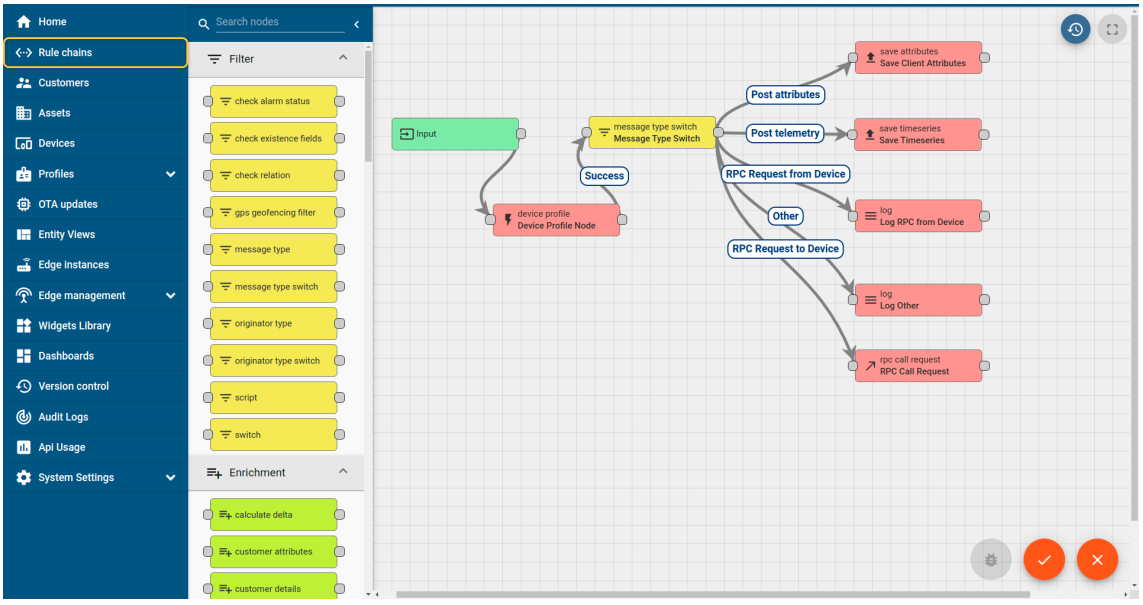
UCT Insight is an IOT platform designed for quick deployment of IOT applications on the same time providing valuable "insight" for your process/business. It has been built in Java for backend and ReactJS for Front end. It has support for MySQL and various NoSql Databases.

- It enables device connectivity via industry standard IoT protocols - MQTT, CoAP, HTTP, Modbus TCP, OPC UA
- It supports both cloud and on-premises deployments.

It has features to

- Build Your own dashboard
- Analytics and Reporting
- Alert and Notification
- Integration with third party application(Power BI, SAP, ERP)
- Rule Engine





ii. Smart Factory Platform (FACTORY WATCH)

Factory watch is a platform for smart factory needs.

It provides Users/ Factory

- with a scalable solution for their Production and asset monitoring
- OEE and predictive maintenance solution scaling up to digital twin for your assets.
- to unleased the true potential of the data that their machines are generating and helps to identify the KPIs and also improve them.
- A modular architecture that allows users to choose the service that they what to start and then can scale to more complex solutions as per their demands.

Its unique SaaS model helps users to save time, cost and money.

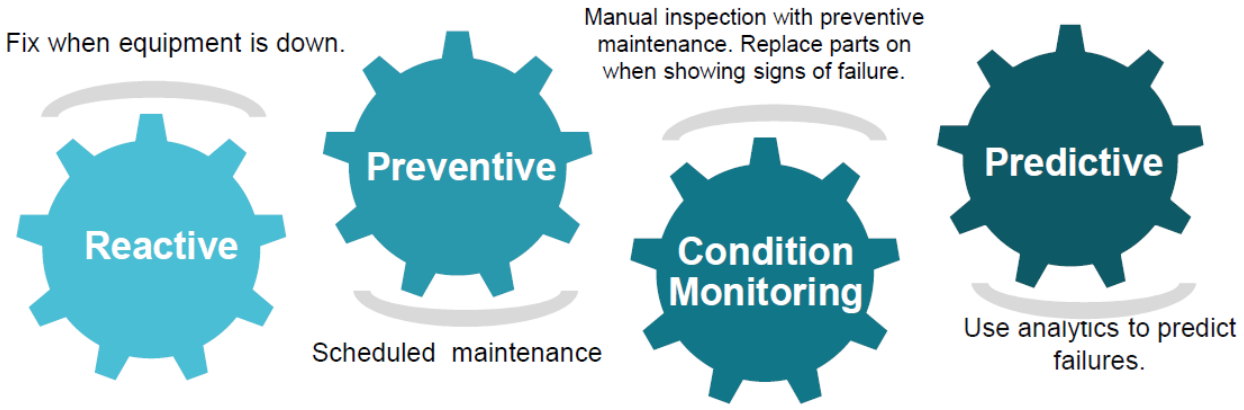
Machine	Operator	Work Order ID	Job ID	Job Performance	Job Progress		Output		Rejection	Time (mins)				Job Status	End Customer
					Start Time	End Time	Planned	Actual		Setup	Pred	Downtime	Idle		
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i
CNC_S7_81	Operator 1	WO0405200001	4168	58%	10:30 AM		55	41	0	80	215	0	45	In Progress	i

iii. LoRaWAN based Solution

UCT is one of the early adopters of LoRAWAN teschnology and providing solution in Agritech, Smart cities, Industrial Monitoring, Smart Street Light, Smart Water/ Gas/ Electricity metering solutions etc.

iv. Predictive Maintenance

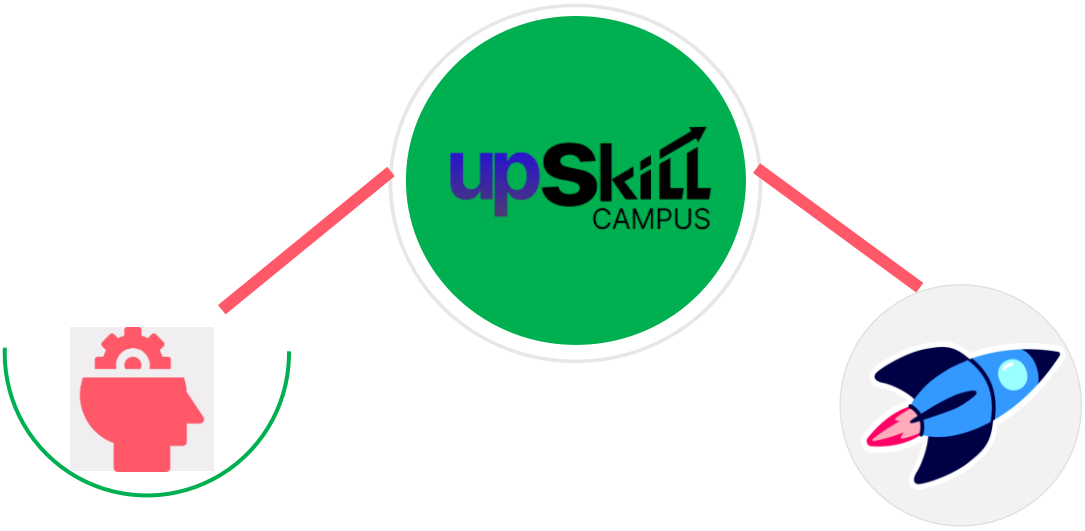
UCT is providing Industrial Machine health monitoring and Predictive maintenance solution leveraging Embedded system, Industrial IoT and Machine Learning Technologies by finding Remaining useful life time of various Machines used in production process.



2.2 About upskill Campus (USC)

upskill Campus along with The IoT Academy and in association with Uniconverge technologies has facilitated the smooth execution of the complete internship process.

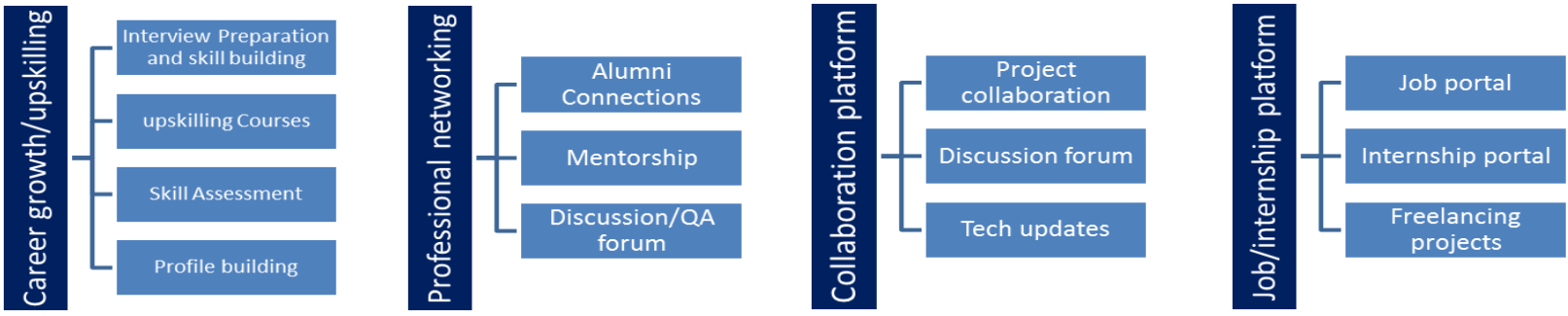
USC is a career development platform that delivers **personalized executive coaching** in a more affordable, scalable and measurable way.



Seeing need of upskilling in self paced manner along-with additional support services e.g. Internship, projects, interaction with Industry experts, Career growth Services

upSkill Campus aiming to upskill 1 million learners in next 5 year

https://www.upskillcampus.com/



2.3 The IoT Academy

The IoT academy is EdTech Division of UCT that is running long executive certification programs in collaboration with EICT Academy, IITK, IITR and IITG in multiple domains.

2.4 Objectives of this Internship program

The objective for this internship program was to

- ☛ get practical experience of working in the industry.
- ☛ to solve real world problems.
- ☛ to have improved job prospects.
- ☛ to have Improved understanding of our field and its applications.
- ☛ to have Personal growth like better communication and problem solving.

2.5 Reference

[1] https://www.upskillcampus.com

[2] https://www.uniconvergetech.in

3 Problem Statement

In the assigned problem statement, it was mentioned that

Description: The URL shortener is a Python project that converts long URLs into shorter, more manageable links. It takes a long URL as input, generates a unique shortened URL, and redirects users to the original URL when the shortened link is accessed.

Scope: The scope of this project involves designing a user interface to input long URLs and display the shortened links, implementing a database to store the mapping between original and shortened URLs, and developing functions to generate unique shortened URLs and handle redirection

4 Existing and Proposed solution

There already exists some URL shortening applications in the internet like bitly.com or shorturl.com which provides the users with shortened URLs. But they charge money after crossing a limit of shortening the URLs and it might get costly for frequent users.

Whereas my application does not charge any money from the users and they can shorten as much URLs they want. Also the work history will be saved for the users who has signed up in the application.

4.1 Code submission (GitHub link)

https://github.com/RaySoham1022/MyURLShortener

4.2 Report submission (GitHub link):

https://github.com/RaySoham1022/MyURLShortener

4.3 Link for Live Hosted Project:

http://sohamray.pythonanywhere.com

5 Proposed Design/ Model

I have made the URL Shortening Application which can provide us with shorter URLs when we enter the longer ones and the redirection is handled properly.

The name of my web application is “MyURLShortener” and I have already hosted it live.

Here I will provide a short description of my project.

Project Link (Hosted Live) :- http://sohamray.pythonanywhere.com

Project Repository :- https://github.com/RaySoham1022/MyURLShortener

5.1 PROJECT DESCRIPTION

(Completed on 28th June 2023)

- Programming Language Used :- Python 3.11
- Front End made by – HTML, Tailwind CSS
- Back End made by – Django Framework
- Database used – SQLite
- Hosted on – pythonanywhere

How to Use

Visit the link of the live hosted project. You will land on the home page of the MyURLShortener website. First do the signup from the navigation bar. After signup, you will be redirected to the Log In page. Log In with the email id and password you provided for registration.

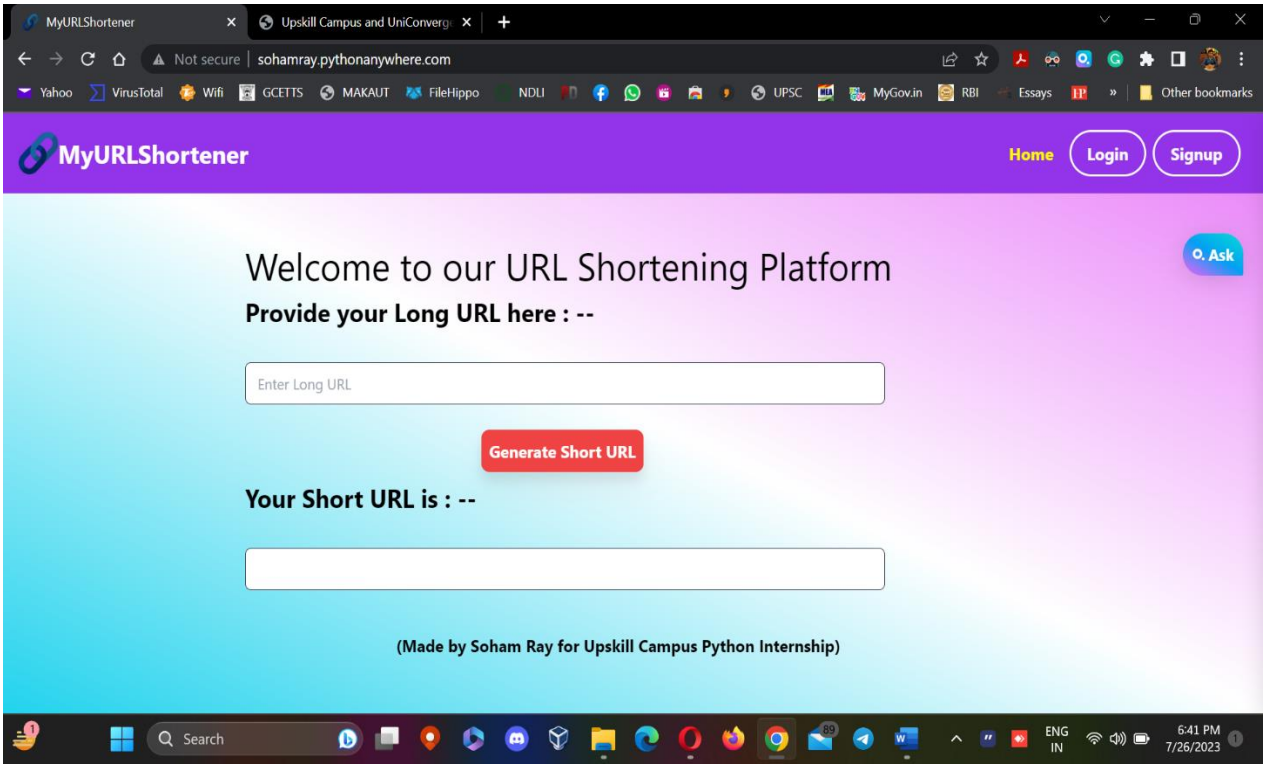
After login you are good to go for using this software.

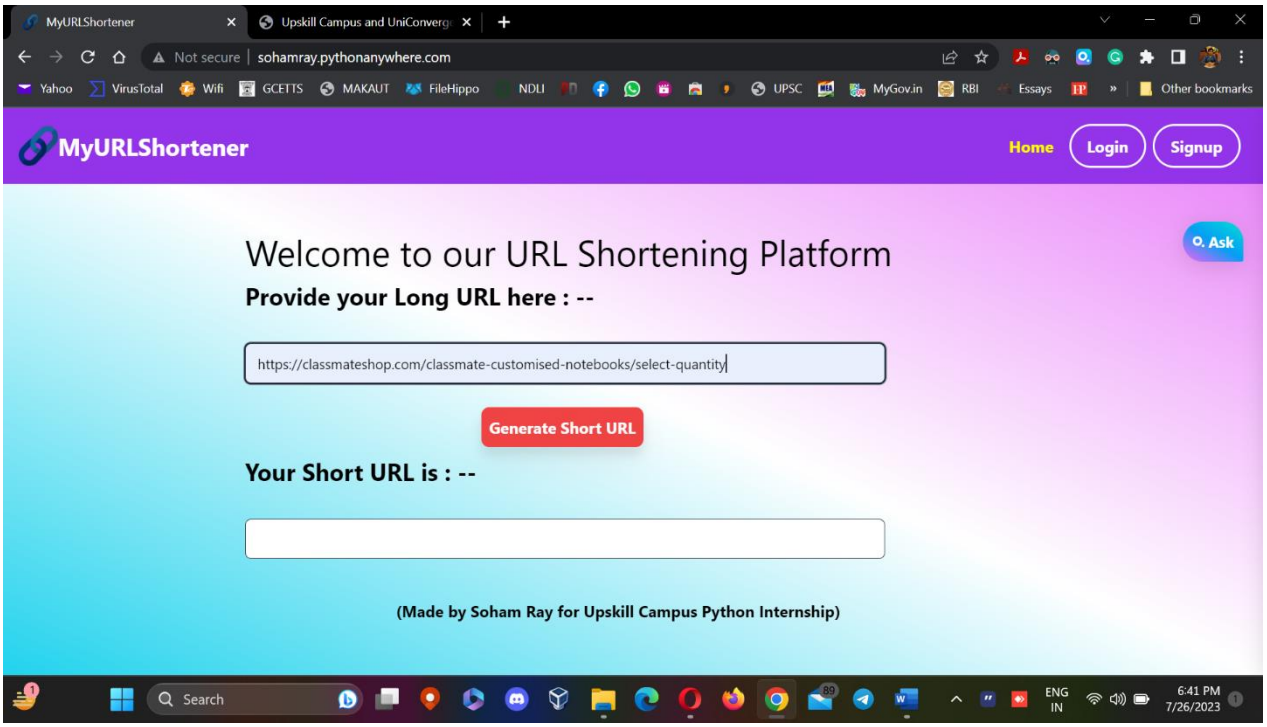
In the Home Page, you can see the textbox where you can enter a long URL. Then click on the “Generate Short URL” button and you will get the shorter URL in the below box. For example, if you enter https://www.geeksforgeeks.org/gfg-codecamp-build-coding-habit-in-just-21-days/ in the long URL field then you will get https://tinyurl.com/23x78t6l as the short URL. Clicking this short URL will redirect you to the same longer URL you have entered.

In the “My URLs” section, you can see the table where the long and corresponding short URLs are there for which you have used this platform. That means, you can see the history and you will not have to shorten the same URL again. It will be available in the platform for recurring use and it will be valid for lifetime.

For constraints of front end for now, it is advised to use the platform in computers only. It will be tried to made better and a mobile version will be incorporated in future.

5.2 Screenshots of the Application




MyURLShortener
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Not secure
sohamray.pythonanywhere.com
MyURLShortener
Home
Login
Signup
Ask
Welcome to our URL Shortening Platform
Provide your Long URL here : --
https://classmateshop.com/classmate-customised-notebooks/select-quantity
Generate Short URL
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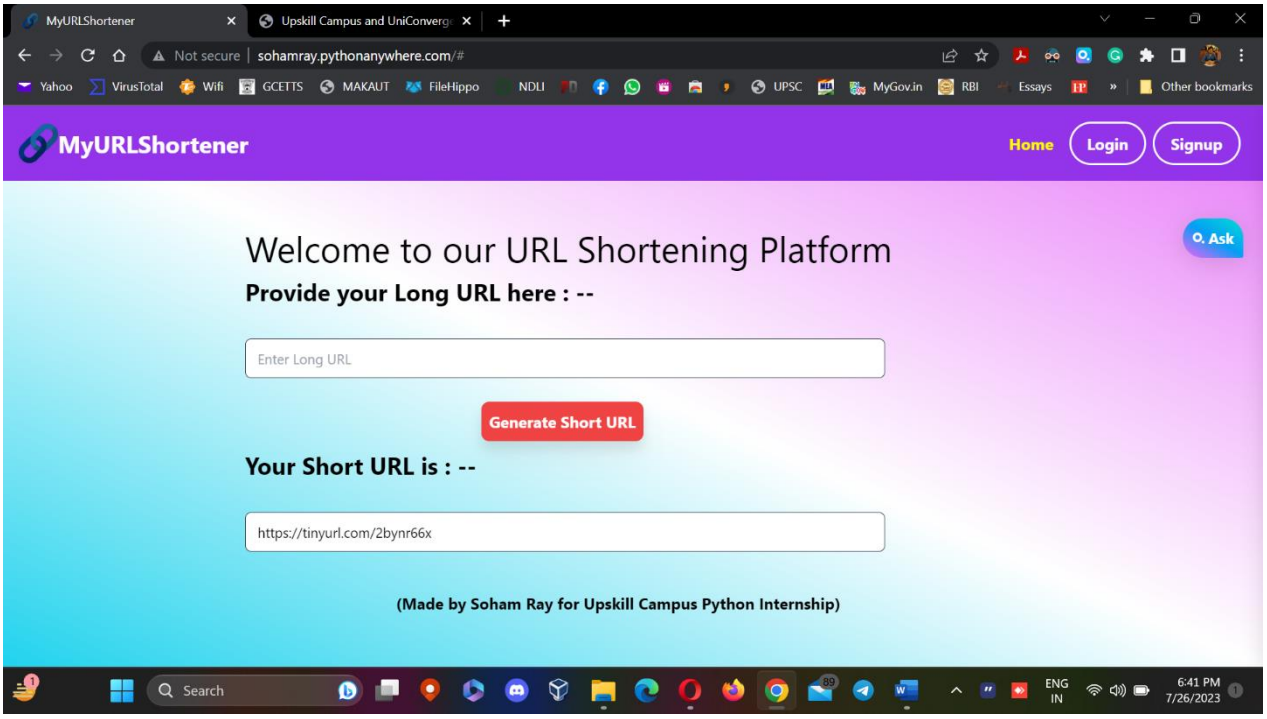
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Generate Short URL
Your Short URL is : --
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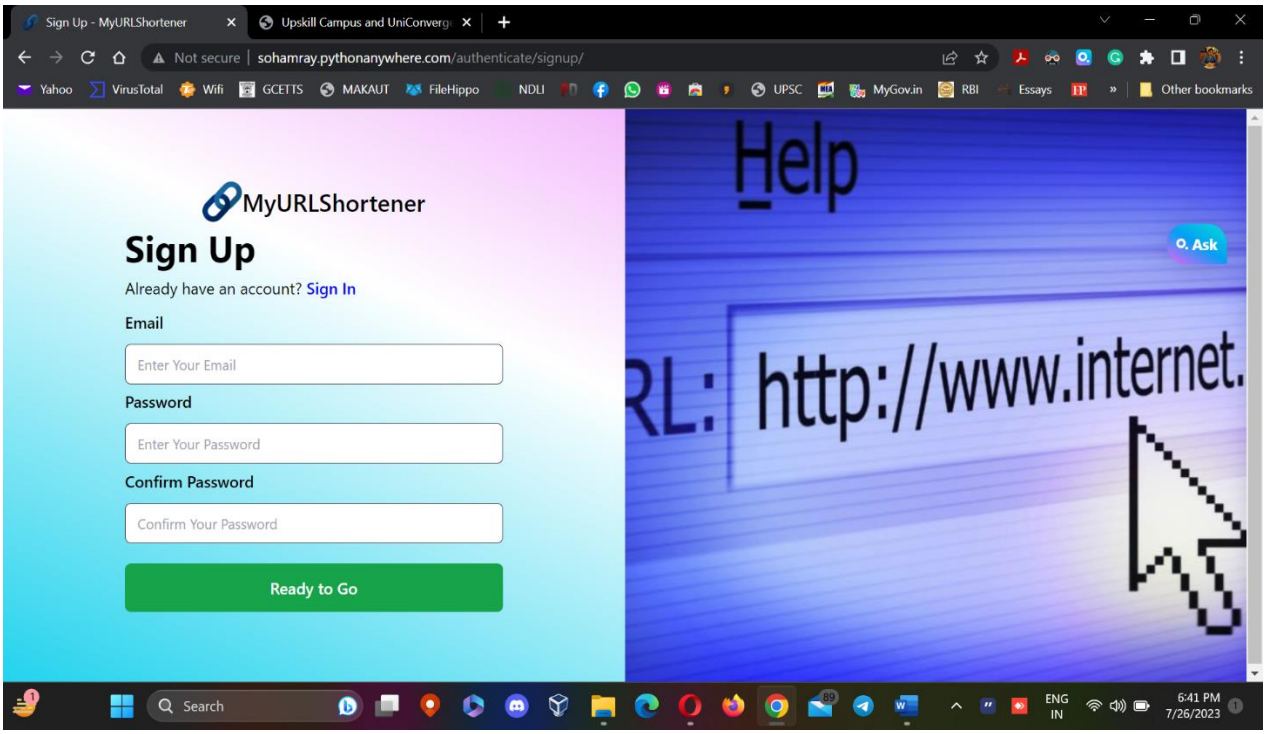
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MyURLShortener
Sign Up
Already have an account? Sign In
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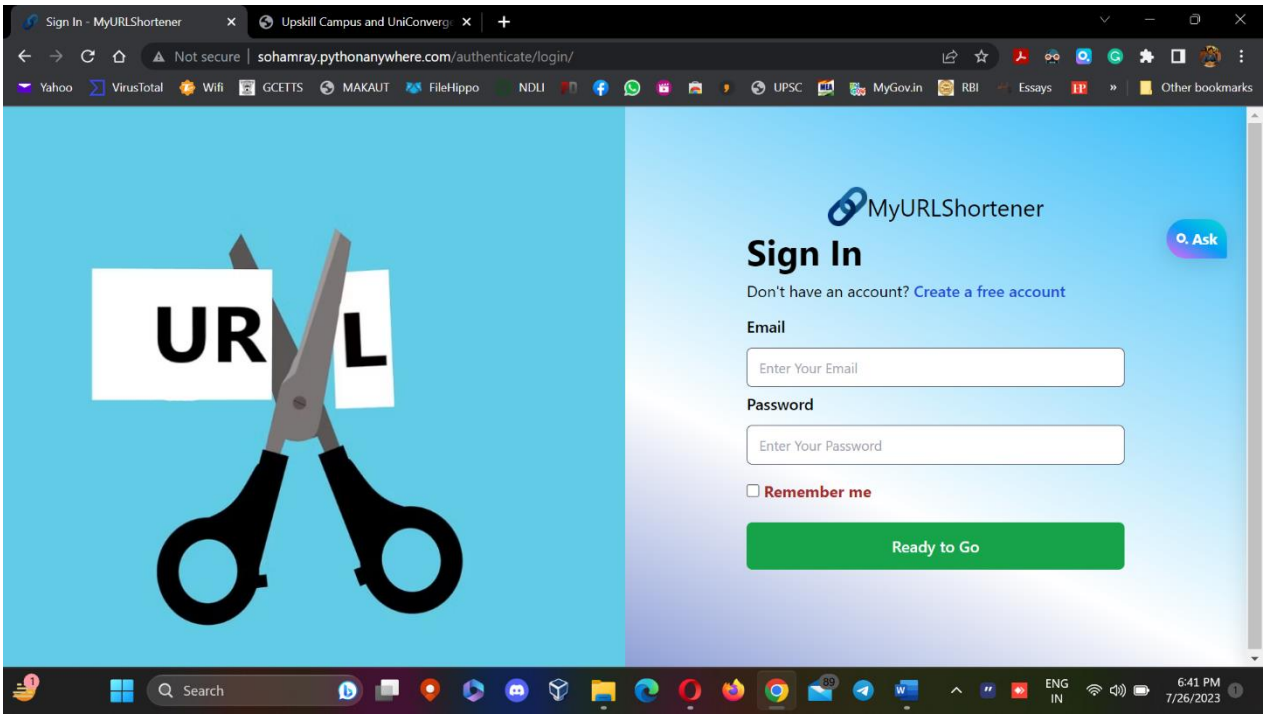
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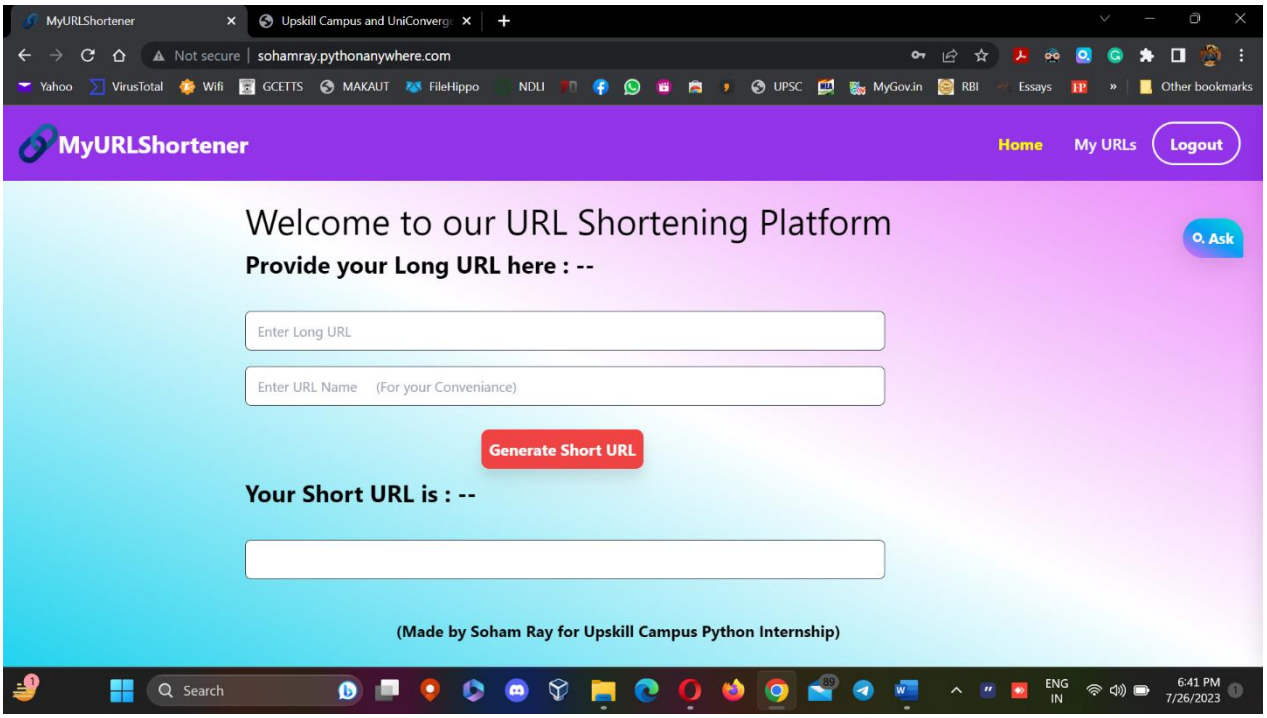
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MyURLShortener
Home
My URLs
Logout
Welcome to our URL Shortening Platform
Provide your Long URL here : --
Ask
Enter Long URL
Enter URL Name (For your Conveniance)
Generate Short URL
Your Short URL is : --
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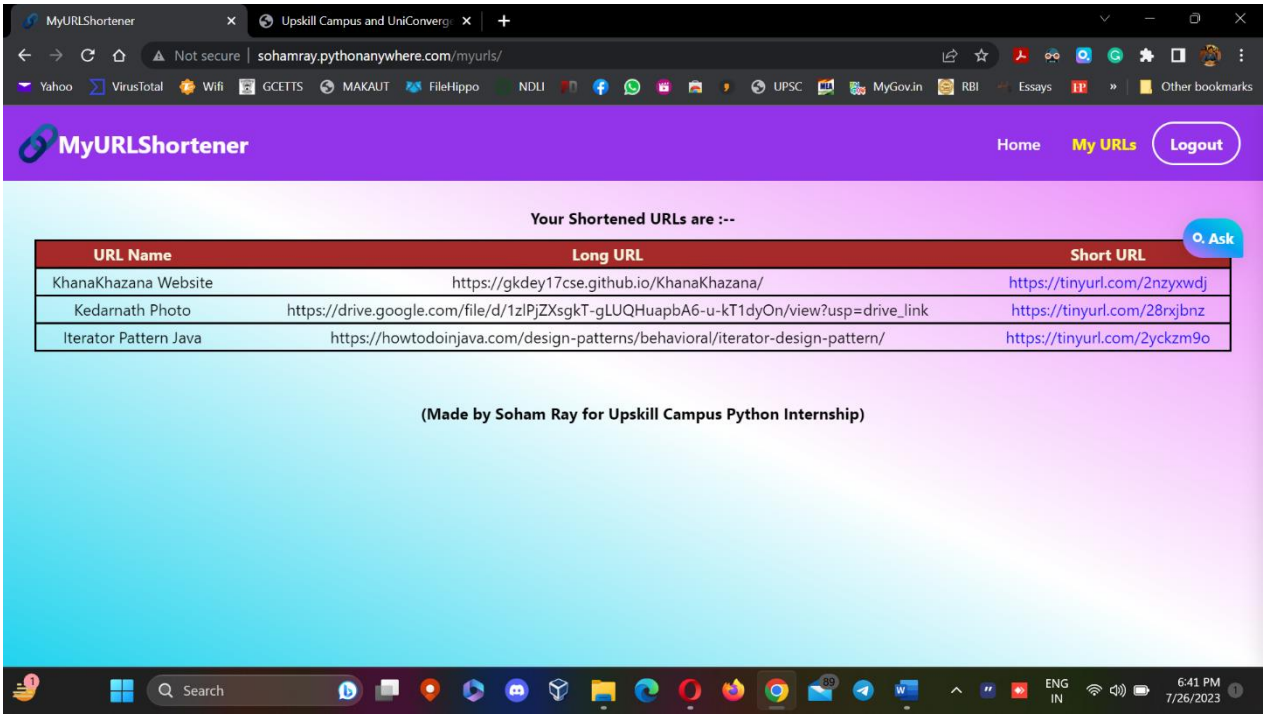
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Yahoo VirusTotal Wifi GCETTS MAKAUT FileHippo NDLI UPSC MyGov.in RBI Essays Other bookmarks
MyURLShortener
Home
My URLs
Logout
Your Shortened URLs are :--
Ask
URL Name
Long URL
Short URL
KhanaKhazana Website
https://gkdey17cse.github.io/KhanaKhazana/
https://tinyurl.com/2nzyxwdj
Kedarnath Photo
https://drive.google.com/file/d/1zlPjZXsgkT-gLUQHuapbA6-u-kT1dyOn/view?usp=drive_link
https://tinyurl.com/28rxjbnz
Iterator Pattern Java
https://howtodoinjava.com/design-patterns/behavioral/iterator-design-pattern/
https://tinyurl.com/2yckzm9o
(Made by Soham Ray for Upskill Campus Python Internship)
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6 Performance Test

This is very important part and defines why this work is meant of Real industries, instead of being just academic project.

The constraint in the application is that it is suitable for laptop and desktop for better experience

It is tested that the URL shortening works perfectly for the Mobile Devices. Just some minor issue regarding the responsiveness of the website in the small screens.

The test results worked completely fine for the constraints.

((Constraints can be e.g., memory, MIPS (speed, operations per second), accuracy, durability, power consumption etc. In case I could not test them, but still, I should mention how identified constraints can impact your design, and what are recommendations to handle them.))

6.1 Test Plan/ Test Cases

Three long URLs were chosen as the Test Cases for the application. They were

1. https://gkdey17cse.github.io/KhanaKhazana/
2. https://drive.google.com/file/d/1zlPjZXsgkT-gLUQHuapbA6-u-kT1dyOn/view?usp=drive_link
3. https://howtodoinjava.com/design-patterns/behavioral/iterator-design-pattern/

6.2 Test Procedure

It was tested in the application that whether the application can generate short URLs for these longer ones and proper redirection is followed or not when the shorter ones are clicked.

6.3 Performance Outcome

The short URLs generated from the application are as follows. They work completely fine.

1. https://tinyurl.com/2nzyxwdj
2. https://tinyurl.com/28rxjbnz
3. https://tinyurl.com/2yckzm9o

7 My learnings

My learnings about Python Development from this internship are mentioned as following-

- Roadmap for learning Python in 2023
- Python Language Use and Development Frameworks
- Django and Flask for Developing projects
- Relation between Numpy and Pandas Libraries
- Key Features of Numpy like ndarray
- Basic Linear Algebra Subprogram (BLAS) and LAPACK
- Key Features of Pandas helping to transform and pivot datasets
- Label-based partitioning, fancy indexing, and subsets of large datasets.
- Data type supported and Data Objects in Numpy and Pandas
- Uses in Machine Learning and Deep Learning
- Performance on complex operations
- The use of Numpy Library in Python
- The use of Pandas Library in Python
- Dealing with N-Dimensional Arrays in Python using Numpy Module
- Applications of the concepts of data science using Pandas Module
- Arranging Elements in the array, using start, stop, step while creating an array, using random numbers and integers to create an array using Numpy
- How can Python help in Search Engine Optimization (SEO)
- Python Search Engine Optimization Analyzer
- Link Status Analyzer using pylinkvalidator
- Keywords Ranking Computation using pytrends and matplotlib
- Website Speed Optimization using Selenium and BeautifulSoup
- Meta Tag Optimization using XPATHs
- Advantages of Automating Python

8 Future work scope

In the future, URL shorteners are likely to continue playing a significant role in digital marketing, although their specific impact may evolve. Here are a few potential trends and considerations for the future of URL shorteners and their impact on digital marketing:

Enhanced Analytics: URL shorteners have always provided basic click-tracking and analytics features. In the future, they may offer more advanced analytics capabilities, providing marketers with deeper insights into user behavior, engagement, and conversion rates. This can help optimize marketing campaigns and measure their effectiveness more accurately.

Personalized and Dynamic URLs: URL shorteners may incorporate personalization and dynamic URL capabilities. Marketers can create unique shortened URLs for each user or campaign, allowing them to deliver tailored content and track individual user interactions more effectively. This can enhance personalization efforts and improve campaign targeting and measurement.

Mobile and Social Media Optimization: As mobile and social media continue to dominate online interactions; URL shorteners will adapt to meet the needs of these platforms. They may offer features like deep linking, which takes users directly to a specific section or content within a mobile app, and social media integration to optimize sharing and engagement on popular platforms.

Trust and Security: URL shorteners have faced concerns regarding trustworthiness and the potential for misuse, such as phishing attacks or malware distribution. In the future, URL shorteners will likely prioritize security measures to combat these issues and establish trust with users. Implementing mechanisms like link validation, malware scanning, and reputation monitoring can help mitigate risks and maintain user confidence. Integration with Marketing Automation: URL shorteners may integrate with marketing automation platforms, allowing for seamless tracking and measurement of user interactions across different marketing channels. This integration can help marketers gain a holistic view of their campaigns, automate workflows, and trigger personalized actions based on user behavior.

Emerging Technologies: Advancements in technology, such as augmented reality (AR) or voice-activated devices, may introduce new possibilities for URL shorteners. For instance, AR-enabled short URLs could provide interactive experiences, while voice-activated devices could generate voice-friendly short URLs for easy access and engagement.

Overall, URL shorteners will likely continue to serve as valuable tools for digital marketing, providing marketers with improved analytics, personalization, and optimization capabilities. However, as with any marketing tool, their success will depend on the implementation strategy, user experience, and adherence to best practices for privacy and security.