Age and Gender Detection Using Deep Learning

Project Domain / Category

Desktop Based Application

Abstract / Introduction

We propose a Desktop based Gender and Age Detection software system. It will use deep learning to accurately identify Gender and Age from a single image. The project aims to develop a computer vision-based system that can detect the gender and approximate age of individuals from images. OpenCV, a popular open-source computer vision library, will be used to process and analyze the images. The system will employ deep learning techniques to accomplish gender and age detection.

Project Components:

1. **Data Collection:** Gather a diverse dataset of images with labeled gender and age information.
2. **Data Preprocessing:** Prepare and clean the dataset by resizing images, normalizing pixel values, and organizing the data for training and testing. Arrange dataset according into the age groups. For example, (0-2), (3-6), and (7-10) etc.
   Dataset: https://www.kaggle.com/datasets/ttungl/adience-benchmark-gender-and-age-classification
3. **Model Selection:** Choose a deep learning model for gender and age detection. Popular choices include Convolutional Neural Networks (CNNs), pre-trained models like VGGFace, or custom architectures.
   Helping material: https://talhassner.github.io/home/publication/2015_CVPR
4. **Model Training:** Train the selected model using the preprocessed dataset. Fine-tuning on a pre-trained model can significantly improve accuracy.
5. **Model Evaluation:** Evaluate the model's performance using metrics such as accuracy and precision. Fine-tune the model to achieve the desired level of accuracy.
6. **Real-time Detection:** Implement a real-time detection pipeline using OpenCV to upload a image from and apply the trained model for gender and age detection.
7. **User Interface:** Create a user-friendly interface.
8. **Deployment:** Deploy the system on desktop.
9. **Testing and Validation:** Conduct thorough testing on various datasets and in real-world scenarios to ensure the system's accuracy and reliability.

Technologies and Tools:

- Python
- OpenCV

Note:

1. Supervisor or University are not liable to provide any paid resource required for project development.
2. Python skills and prior knowledge of image processing and deep learning is required. Please thoroughly study the proposal and then opt for the project.

Supervisor:
Name: Hina Rafique
Email ID: hina.rafique@vu.edu.pk
Skype ID: live:hina.rafique

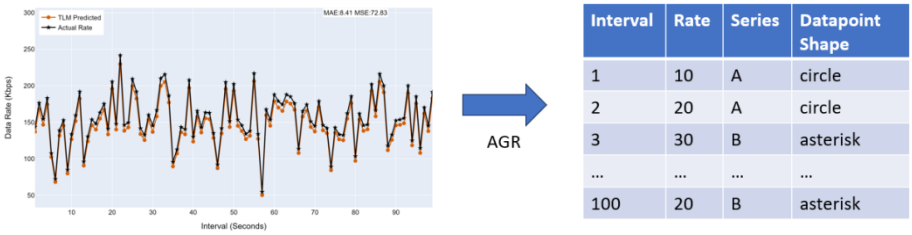
Automated Graph Reader (AGR)

Project Domain / Category

Software Engineering/Web/Desktop/Machine learning/Research.

Abstract / Introduction

Data mining has several real-world applications, and data acquisition is the first step in the process of analysis and perform decision-making tasks. Sometimes, data is only available in graphical images that may require costly computational methods to process. However, the computational complexity can be reduced by extracting the data from graph images and then using numeric data instead of images in future phases of analysis and prediction. In this project, students are required to design and develop a Web or Desktop Application in the language of their choice to extract graph data from images.



Interval	Rate	Series	Datapoint Shape
1	10	A	circle
2	20	A	circle
3	30	B	asterisk
...	...	...	...
100	20	B	asterisk

Figure 1 - Graph Reading

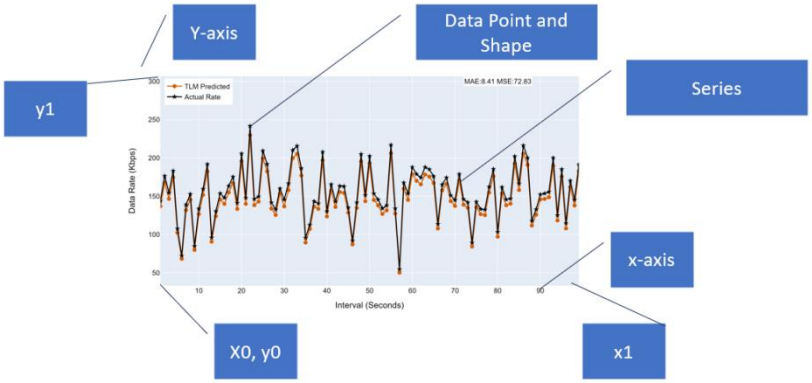


Figure 2 - Graph Components

Functional Requirements:

The functional requirements are grouped into two phases. In the first phase, students will develop a prototype following specific requirements. The requirements in the first phases are implementation of basic functionality. In second phase, students will develop the final version of the web or desktop application with additional requirements as specified below. The requirements of the second phase mostly focus on automatic detection and extraction of data and batch processing.

1.1 Prototype Phase

1.1.1 Image Processing

The solution should allow processing the input images in terms of cropping, changing colors, and image improvement.

1.1.2 Image Cropping and Alignment

- Crop additional white space around graphs' sides manually in batch mode.

- Align the graph's sides manually in batch mode.
- Align the graph's sides manually in batch mode automatically.

1.1.3 Image Scaling and axis detection

- Allow users to manually specify the scale of the graph by selecting the corner points and assigning the values.

1.1.4 Data Point Selection

- Allow manual selection of data points and calculate the coordinates automatically.
- Data shapes
  - Circle Filled (●)
  - Asterisk (*)
  - Cross (x)
- Graph Types
  - The solution should be able to work on the following graphs at least.

Line Bar Network

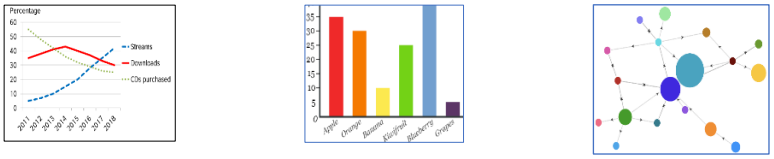


Figure 3 - Graph Types

1.1.5 Data Persistence

- Store all extracted data against the user's specified data.
- All the operations must be interactive.

1.1.6 Processing Flow

- Upload Images
- Preprocess
- Axis selection and Scaling
- Datapoint Selection/Detection
- Save Data
- Process next image

1.2 Final Application

1.2.1 Image Cropping and Alignment

- Crop additional white space around graph sides automatically

1.2.2 Image Scaling and axis detection

- Allow automated scale rendering by reading the values of the image graph. No user input should be required for this feature.

1.2.3 Data Point Selection

- Data shapes
  - All distinct marker shapes.

- Graph Types
    - The solution should be able to work on all graph types.
- Detect the graph artifacts, suggest suitable data points, and calculate their coordinates automatically.

1.2.4 Data Persistence

- Persist all extracted data in MySQL/Sqlite/MongoDB.

1.2.5 Batch Processing

- Batch Uploading Images
- Batch Preprocessing
- Automated Axis selection and Scaling
- Automated Datapoint Selection/Detection

Tools:

Languages: Python, PHP, C/C++
IDE: IDE of choice
OS: Linux/Window of Choice
Graph Repository: any, Example : https://github.com/JasonObeid/Chart2TextImages

Supervisor:

Name: Arif Husen
Email ID: arif.husen@vu.edu.pk
Skype ID: vu.arifhrashid@outlook.com

Online Daily Prize Draw System with Fraud Detection

Project Domain / Category

Data Science / Machine Learning

Abstract / Introduction:

We propose the development of an online platform that facilitates a daily prize draw for a committee of 10,000 participants, each contributing 100 PKR per day. The system will announce a daily winner who will receive a cash prize of 10,00,000 PKR. The platform will handle user management, prize distribution, and ensure transparency in the process. In addition, we will integrate a fraud detection module that will be trained by users on publicly available datasets, such as Credit Card Fraud Detection. The goal is to create an engaging, fair, and secure system for participants while also contributing to participant welfare.

Functional Requirements:

1) User Management:

Users will be able to create accounts with personal details, including name, address, email, and phone number.
Admin functionalities will include creating, editing, and deleting user accounts.

2) Deposit and Participation:

Users will deposit 100 PKR per day, and the system will maintain their contribution records.
The system will automatically enter them into the daily prize draw.

3) Daily Winner Selection:

The system will randomly select a winner each day from the pool of participants.
The winner will receive 80% of the daily collected amount, i.e., 10,00,000 PKR.

4) Prize Distribution:

The system will calculate and deduct a 5% service charge from the daily prize amount.
The remaining 15% will be saved for the participant's welfare fund.

5) Monthly Returns:

The system will provide the winner with a monthly return of 1,000 PKR along with the 10 PKR/day deposit for a specified duration.

6) Transparency and Audit:

The system will ensure transparency in winner selection and fund management.
Audit logs and reports will be available for scrutiny.

7) Fraud Detection Module:

Users will have the opportunity to train the fraud detection module by providing it with publicly available datasets, such as bank transaction data.
The module will use machine learning to detect potential fraud within the prize draw system.

Users' input and training data will continuously improve the module's accuracy.

7.1) Fraud Detection Module with "Credit Card Fraud Detection" Dataset:

For our fraud detection module, we will utilize publicly available datasets to train the system effectively. Specifically, we will employ the "Credit Card Fraud Detection" dataset, which can be accessed on Kaggle using the following link:

Dataset Kaggle: https://www.kaggle.com/datasets/mlg-ulb/creditcardfraud

7.2) Deep Overview of the Module:

Our fraud detection module plays a critical role in maintaining the integrity and security of the daily prize draw system. Users' contributions and participation generate valuable data that our machine learning model processes to identify potential fraudulent activities. This module operates as follows:

A) Data Acquisition:

We will fetch and preprocess data from the "Credit Card Fraud Detection" dataset, which contains both legitimate and fraudulent credit card transactions. The dataset includes features related to transaction amounts, timestamps, and various anonymized attributes.

B) Model Training:

Machine learning algorithms, such as anomaly detection models or supervised classifiers, will be used to train the fraud detection model on this dataset. The model will learn to distinguish between legitimate and fraudulent transactions.

C) Continuous Learning:

The fraud detection module will continuously evolve and improve as more data is fed into it. User input and ongoing training data will be integrated to enhance the model's accuracy in identifying potential fraud.

D) Real-time Monitoring:

The model will monitor daily prize draw transactions in real-time, evaluating each transaction against the learned patterns of fraudulent behavior. Any anomalies or deviations from the learned behavior will be flagged for further investigation.

E) Alerting and Reporting:

When potential fraudulent activity is detected, the system will generate alerts for administrators or moderators to investigate further. Users will be encouraged to report any suspicious activity as well.

Conclusion:

The proposed online daily prize draw system with an integrated user-trained fraud detection module aims to create an exciting, transparent, and secure platform for participants while contributing to their welfare. We believe that this project will provide added value and security, and we look forward to your consideration and collaboration.

Tools:

Python: For machine learning, web scraping, and back-end development.
JavaScript: For front-end interactivity and real-time updates.

Frameworks and Libraries:
Django: A Python web framework for building the back end of the web application.

HTML: For structuring web content.
CSS: For styling and layout.
Bootstrap: A CSS framework for responsive web design.
Machine Learning:
scikit-learn: A Python library for machine learning and data analysis.

Supervisor
Name: Muhammad Kaleemullah
Email ID: m.kaleem@vu.edu.pk
Skype ID: kaleembhatti561

Diabetes Prediction using classification method

Project Domain / Category
Machine learning, data science.

Abstract / Introduction
This model will help patient as well as doctors to diagnose that a patient has a diabetes or not. It will be predicting the data on the basis of dataset. A detailed informative data is given which will be used to train the model for prediction.

Functional Requirements:
Follow the given life cycle to develop this method.
https://www.javatpoint.com/machine-learning-life-cycle
Admin (Student) will perform all of these tasks (Functional Requirements).

Module:
- **Import Data:** Import the dataset files in system. (first download data set from *https://www.kaggle.com/datasets/akhilalexander/diabeticprediction*)
- **Display Data:** Display the summary statistics, trends, patterns and insights on the data visually by performing the EDA (Exploratory Data Analysis).
- **Pre-process the data**
    - Split the data into train (70% of given data set) and test (30% of given data set).
    - Train the model using Neural Network (machine learning algorithm).
- **Testing:** Apply test data on trained model for evaluation.
- **Training:** train the data set for prediction.
- **Apply models:** apply SVM, Decision tree, Logistic regression on the train data.
- **Results:** Predict a patient has diabetics or not. Generate a confusion matrix to assess the Accuracy, Precision, Recall, F1 score in the trained model.
- **Accuracy:** Show which model give the high accuracy for prediction.
- Save the model for future use.

Pre-requisite:
Note: In order to completely understand the machine learning and data science algorithms, watch given tutorials and also google for better understanding.

- https://www.javatpoint.com/machine-learning
- https://ocw.vu.edu.pk/Videos.aspx?cat=Computer+Science%2fInformation+Technology+&course=CS607
- https://www.youtube.com/watch?v=_u-PaJCpwiU&list=PLu0W_9lII9ai6fAMHp-acBmJONT7Y4BSG&index=1
- https://vulms.vu.edu.pk/Courses/CS607/Downloads/AI_Complete_handouts_for_Printing.pdf

Dataset:
https://www.kaggle.com/datasets/akhilalexander/diabeticprediction)

Python Tutorials:
- https://www.programiz.com/python-programming
- https://www.tutorialspoint.com/python/index.htm
- https://www.w3schools.com/python/

Machine Learning Tutorials:

- https://machinelearningmastery.com/machine-learning-in-python-step-by-step/
- https://www.geeksforgeeks.org/machine-learning-with-python/
- https://www.youtube.com/watch?v=ZftI2fEz0Fw
- https://www.simplilearn.com/10-algorithms-machine-learning-engineers-need-to-know-article
- https://www.analyticsvidhya.com/blog/2017/09/common-machine-learning-algorithms/

Tools:

Language: Python (Only python language)
Framework: Anaconda

Supervisor:

Name: warda fiaz
Email ID: warda.fiaz@vu.edu.pk
Skype ID: live:.cid.15e38e2220ca541b

Digital Audio Forensics Using Artificial Intelligence

Project Domain / Category

AI/Deep Learning/Machine Learning

Abstract / Introduction

The disciplines of audio engineering, signal processing, and artificial intelligence are combined in the emerging subject of digital audio forensics. The goal of this field is to analyze and verify the authenticity of audio recordings. In this project, students will delve into the field of digital audio forensics by applying AI approaches to discriminate between authentic and modified audio samples. Students will get hands-on experience in dealing with audio data, recognizing speech features, and developing machine-learning algorithms for audio analysis. Students will also gain an understanding of how to analyze audio.

Helping Material:

- **Free course for "Audio Signal Processing for ML":**

  https://youtu.be/iCwMQJnKk2c?si=Y06bzPADnJLqnSAZ

- **Fake Audio Example:**

  https://youtu.be/AmUC4m6w1wo?si=AvrFa6xz26WkD2sq

- **Audio Forensics:**

  https://youtu.be/kGnDhYIYc2g?si=QBxbnYChM41zd7-t

Prerequisites:

- Basic knowledge of programming languages (Python preferred).
- Familiarity with fundamental concepts of machine learning.
- Understanding of audio processing fundamentals (preferable but not mandatory).

Functional Requirements:

1. User (App User):

- **Upload Audio Clips:**
  - **Requirement:** Users should be able to upload audio clips (real or suspected fake) to the application interface.
- **Initiate Detection:**
  - **Requirement:** Users can initiate the detection process for uploaded audio clips by triggering the neural network model.

- **View Results:**
    - **Requirement:** Users should receive clear and understandable results indicating whether the audio clip is real or fake.
- **Provide Feedback:**
    - **Requirement:** Users may have the option to provide feedback on the accuracy of the detection results to improve the system's performance.

2. Admin/System (Neural Network Model):

- **Receive Audio Clips:**
    - **Requirement:** The neural network model should be able to receive audio clips uploaded by users for analysis.
- **Process Audio Clips:**
    - **Requirement:** The model should process audio clips using appropriate feature extraction methods and machine learning algorithms to differentiate between real and fake audio.
- **Generate Detection Results:**
    - **Requirement:** The model should generate accurate detection results, indicating whether the provided audio clip is real or fake.

Tools:

- Python (programming language)
- Keras (API)
- Tensorflow (open source software library for machine learning) or pytorch
- Jupyter Notebook (open source web application)
- Matplotlib (library)
- Numpy (library for the python)

Supervisor:

Name: Sonia Salman
Email ID: sonia.salman@vu.edu.pk
Skype ID: sonia_salman

Fraud Detection System in Blockchain

Project Domain / Category

Blockchain / Machine Learning

Abstract / Introduction

Recently, blockchain technology has appeared as a powerful decentralized tool for data integrity protection. However, blockchain itself can be the target of many cyber threats.
Blockchain technology is integrated with machine-learning algorithms to detect fraudulent transactions in the Bitcoin network.
The goal of this project is to develop a machine-learning app. That distinguishes between normal and abnormal node behavior in the blockchain using a machine-learning algorithm. In this project, a **Support Vector Machine algorithm (SVM)** will be implemented to detect outliers in blockchain transactions.

Functional Requirements:

The user of the application performs the following tasks.

1. The user will log in to the application and download the given dataset that contains the blockchain historical data. (Link will be provided)
2. Prepare the data for the model.
3. Split the data into train and test sets.
4. Build the SVM model.
5. Fit the train data to the model.
6. Predict the test data.
7. Evaluate the model.
8. Print the results.

Tools:

Python (programming language)
Scikit-learn (Library)
Jupyter Notebook (open-source web application) or Google Colab
Matplotlib (library)
Numpy (library for the python)
Kaggle

Tutorials links:
https://www.datacamp.com/tutorial/machine-learning-python

https://www.edureka.co/blog/support-vector-machine-in-python/#usecase

Supervisor:

Name: Fouzia Jumani
Email ID: fouziajumani@vu.edu.pk
Skype ID: fouziajumani

Implementing Assessment Master through Machine Learning

Project Domain / Category

Machine Learning and Web application

Abstract/Introduction

Assessing students at various cognitive levels can help to achieve better learning consequences in online learning contexts. Elegant education plays a key role in goal-based assessment approaches intending to evaluate student learning rather than just assigning grades. In this project, students will have to develop a test assessment master system by utilizing machine learning approaches.

Functional Requirements:

The following steps should be taken while developing project functionality.

1. The application should have an interface that will select the computer science relevant course (any course that has 12 topics covered). The application should have test items that should be relevant to each topic.

2. The application should have test records of Question stem and key according to the lecture.
3. The application is expected to add cognitive levels of item development like using revised bloom taxonomy.
4. The application should have the assessment that will be conducted online as per evaluation criteria.
5. The application should have evaluation criteria that should be developed through machine learning.
6. Result analysis should be developed and executed to determine difficulty level measurement, index of discrimination measurement, effectiveness of distraction and internal coherence by classification and clustering machine learning approach.

Note: Skype sessions must be attended to communicate with the supervisor about discussion otherwise the project will not be accepted.

Tools/language: Python programming language

Prerequisite: For project problem concepts, students will be expected to cover a short course relevant to the machine learning concepts listed in addition to SRS and initial design documentation. In addition, course links will be provided during Skype sessions.

Supervisor:

Name: Dr. Saima Munawar
Email ID: saima.munawar@vu.edu.pk
Skype ID: saima.vu1

Machine Learning based E-commerce Product Recommendation System and Web Scrapper

Project Domain / Category

Machine Learning

Abstract / Introduction

We propose the development of a Python-based web application for e-commerce stores that aims to assist store owners in finding the best products to sell on their platforms. This project leverages web scraping to collect data from external e-commerce stores, curates and maintains a dataset, and employs machine learning techniques such as linear regression to provide personalized product recommendations based on user buying patterns, date, price, ratings, and more. The core objective is to offer a comprehensive tool for e-commerce businesses to optimize their product offerings and enhance customer satisfaction.

FUNCTIONAL REQUIREMENTS:

Data Collection: Develop a web scraper to gather data from various e-commerce stores, including product details, user ratings, pricing information, and sales history. Comply with data protection and privacy regulations, in data collection and user interaction. Respect the terms of service of the e-commerce stores during web scraping.

Data Preprocessing: Clean and preprocess the scraped data, handling missing values, duplicates, and converting it into a structured format. The classification will mainly focus on user's ratings and number of users rated so you have to preprocess and arrange your data accordingly.

Dataset Management: Maintain an up-to-date dataset that is refreshed on a weekly basis. Ensure a minimum of 100 entries for each product category for effective training.

Machine Learning Model: Implement Machine Learning (ML) supervised algorithms to train a recommendation system based on . The model will take into account user buying patterns, product attributes, historical data, and customer reviews. Linear regression technique can be used to train model and to predict ratings for products. The model is then used to make recommendations to users based on their predicted ratings however you can use any ML technique of your choice.

User Interface: Develop a user-friendly web interface that allows e-commerce store owners to input their preferences, product categories, and other relevant parameters.

Recommendation System: Provide personalized product recommendations to store owners based on their specified criteria (price, category, location, user rating, no. of purchases etc.). Recommendations will be generated for specific product categories based on the criteria mentioned by the user and and most suitable products will be selected for recommendation.

Log creation of predicted results: Create a log in Excel or any database so that users can use the already provided results and filter them out based on their criteria.

Feedback Mechanism: Implement a feedback system for users to provide insights, enhancing the model over time.

This system will have following users:

- Admin
- User

Admin Functionality

- Data Collection
- Data Preprocessing
- Dataset Management
- Feedback Management
- User Management

User Functionality

- Providing specific criteria to system (Category, Price, Location, etc.) to get most recommended products
- Give feedback about the prediction
- Search already most recommended products in this category and filter them out.

TOOLS:

Programming Language: Python

Web Scraping: Utilize web scraping libraries (e.g., Beautiful Soup, Scrapy) to collect data from external e-commerce stores.

Machine Learning: Implement machine learning algorithms for recommendation, considering user buying patterns, product attributes, and reviews.

Web Framework: Develop a web application using a Python web framework (e.g., Django or Flask) for user interaction.

Database: Use a database system (e.g., PostgreSQL, MySQL) or Excel sheet to store and manage the collected data.

Frontend Technologies: HTML, CSS, and JavaScript for the user interface.

Supervisor:

Name: Rehan Ahmed
Email ID: rehan@vu.edu.pk
Skype ID:rehan.vu

Multilingual Identifier

Project Domain:
Machine learning/NLP

Abstract:
The goal of this project is to develop a Multilingual Identification System that can accurately determine the language of a given text. It is quite difficult to identify the language in various applications, including multilingual content processing, global business analytics, and social media monitoring. The proposed system will use natural language processing (NLP) techniques and machine learning algorithms to achieve accurate and efficient language identification.

Functional Requirements:
Admin (Student) will perform all these (Functional Requirements) tasks.

1. Implement preprocessing techniques to clean and standardize the text data.
2. Extract relevant features from the text, considering character n-grams, word frequencies, or embeddings.
3. Evaluate and select appropriate machine learning models for language identification.
4. Experiment with models such as Support Vector Machines (SVM), Naive Bayes, and deep learning approaches like recurrent or transformer-based architectures.
5. Train the selected models on the given dataset.
6. Implement cross-validation to assess the model's performance and generalization on unseen data.
7. Utilize appropriate evaluation metrics such as accuracy, precision, recall, and F1 score.
8. Develop a user-friendly interface for the Language Identification System.
9. Fine-tune the model based on performance feedback.
10. Implement optimization techniques to enhance the efficiency and speed of the language identification system.

Dataset:
https://www.kaggle.com/datasets/basilb2s/language-detection

Helping material:

NLP:
https://www.analyticsvidhya.com/blog/2021/03/language-detection-using-natural-language-processing/
https://www.sciencedirect.com/science/article/pii/S1319157821001804

Python
https://www.python.org/
https://www.w3schools.com/python/
https://www.tutorialspoint.com/python/index.htm

Feature Extraction Method:

https://towardsdatascience.com/feature-extraction-techniques-d619b56e31be
https://www.analyticsvidhya.com/blog/2021/04/guide-for-feature-extraction-techniques/
https://towardsdatascience.com/tf-idf-for-document-ranking-from-scratch-in-python-on-real-world-dataset-796d339a4089
https://www.analyticsvidhya.com/blog/2021/07/feature-extraction-and-embeddings-in-nlp-a-beginners-guide-to-understand-natural-language-processing/
http://uc-r.github.io/creating-text-features

Machine Learning Techniques:

https://towardsdatascience.com/machine-learning-an-introduction-23b84d51e6d0
https://towardsdatascience.com/top-10-algorithms-for-machine-learning-beginners-149374935f3c
https://towardsdatascience.com/10-machine-learning-methods-that-every-data-scientist-should-know-3cc96e0eeee9
https://towardsdatascience.com/machine-learning-classifiers-a5cc4e1b0623
https://www.youtube.com/watch?v=fG4e4TUrJ3E
https://www.youtube.com/watch?v=7eh4d6sabA0

Tools:

Android Studio, Java, Python, Anaconda, OpenCV, TenserFlow, Keras.

Supervisor:

Name: Syed Aun Ali Bukhari
Email ID: aun.ali@vu.edu.pk
Skype ID: syed.aun89

Named Entity Recognition System using Deep Learning

Project Domain / Category

Natural Language Processing/Deep Learning

Abstract / Introduction

Named Entity Recognition (NER) is a fundamental task in natural language processing (NLP) that involves identifying and classifying named entities in text. Named entities are real-world objects, such as people, organizations, locations, dates, and times. NER has a wide range of applications, including information extraction, machine translation, question answering, and text summarization.

The admin (student) will develop a system to detect Named entity and find accuracy by applying appropriate deep learning techniques for Named entity recognition. The system will also compare which techniques are best for Named entity recognition and why.

Functional Requirements:

Admin (Student) will perform all the following tasks.

1. **Data Annotation:** Annotate dataset for named entities and preprocess the text data. There will be following tags for dataset (ORGANIZATION, PERSON, LOCATION, DATE, TIME, MONEY, PERCENT, FACILITY, GPE).
2. **Model Selection and Development:** Investigate NER models and select an appropriate architecture (e.g., BiLSTM-CRF, LSTM, CRF, BERT-based models) for development.
3. **Train & Test Data:** Split data into 70% training and 30% testing data sets.
   Train the selected model on the annotated dataset to learn to recognize named entities effectively.
4. **Evaluation and Fine-tuning:** Assess the model's performance using standard NER evaluation metrics (e.g., F1-score, precision, recall) and fine-tune the model for improved accuracy.
5. **Confusion Matrix:** Create a *confusion matrix* table to describe the performance of a classification model.
6. **Accuracy Evaluation:** Find the accuracy of all techniques and compare their accuracy.
   **This project will also tell us which machine learning technique is better to detect Named entity.*
7. **Named Entity Categorization:** Develop a system that not only recognizes entities but also categorizes them into predefined categories (e.g., person, organization, location).
8. **Integration with Applications**: Build an interface for users to input text and integrate the NER system into applications that demonstrate its utility.

Dataset:

https://drive.google.com/file/d/1oR5fq7VbUBPIVX64SBmY19LFcnVK0cYu/view?usp=drive_link
**You must use your VU email id to access/download the dataset.*

Tools:

- Python
- jupyter notebook
- Colab
- PyQt
- wxPython
- Tkinter
- Kivy
- PySimpleGUI

Prerequisite:

Artificial Intelligence, Machine Learning, and Natural Language Processing Concepts,
"Admin (student) s will cover a short course relevant to the mentioned concepts besides SRS and Design initial documentation or see the links below."

Helping Material

Python

https://www.python.org/
https://www.w3schools.com/python/
https://www.tutorialspoint.com/python/index.htm

Deep Learning:

https://www.tutorialspoint.com/python_deep_learning/index.htm
https://www.tutorialspoint.com/deep-learning-tutorials/index.asp
https://www.youtube.com/watch?v=VyWAvY2CF9c
https://www.youtube.com/watch?v=6M5VXKLf4D4

Supervisor:

Name: Umair Ali
Email ID: umairali@vu.edu.pk
Skype ID: live:umairalihamid_1

Machine Learning-Based Doctor Recommender System

PROJECT CATEGORY/DOMAIN

Machine Learning-Based Project

Abstract/Introduction

The goal of this project is to develop a machine learning-based doctor recommender system that helps users find the most suitable doctors based on various attributes. The system will utilize web scraping techniques to collect data from the oladoc.com website, which will then be used to create a comprehensive data set. This data set will contain relevant fields such as "number of patients," "fee," "specialty," "years of experience," "waiting time," "rating," "doctor name," "location," and "highest degree" etc.

Proposed System

The doctor recommender system will focus on delivering high-quality recommendations by considering the "satisfaction level" of each doctor, although this satisfaction level will not be included in the data set. Doctors will only be recommended if their satisfaction level exceeds 95%.

The Machine Learning-Based Doctor Recommender System aims to enhance the process of finding the right doctor for patients. By collecting and analyzing data from oladoc.com, we will create a robust data set and a recommendation system that considers the doctors' attributes and satisfaction levels. This project addresses a real-world problem and has the potential to improve the healthcare experience for users.

Project Functional Requirements

1. Data Collection: Implement a web scraping mechanism using Beautiful Soup in Python to extract relevant data from oladoc.com, including the specified attributes.

2. Data Preprocessing: Clean, normalize, and transform the collected data to create a high-quality data set. Handle missing values, encode categorical variables, and prepare the data for machine learning.

3. Data-set Creation: Build a data set with a minimum of 100 records for each specialty, ensuring diversity and accuracy in the data.

4. Machine Learning Model: Develop a binary classification model that predicts whether a doctor is recommended or not based on the specified attributes, with a focus on doctors' satisfaction levels.

5. Model Training: Train and fine-tune the machine learning model using the created data set.

6. Recommendation System: Create a user-friendly recommendation system that takes user preferences and requirements into account. The system should provide a list of recommended doctors based on input criteria.

7. User Interface: Design a user interface that allows users to interact with the recommendation system and input their preferences.

8. Evaluation: Evaluate the model's performance using appropriate metrics and validate the recommendation system's effectiveness in providing suitable doctor recommendations.

There are two actors for this project:

1. Admin
2. User \ Patient

Functional Requirements of Admin

- Data Collection
- Data Preprocessing
- Data-set Creation
- Model Training

Functional Requirements of User \ Patient

- Give his \ preferences as input to the system to find a doctor.
- Give feedback about the result of the model.
- Rate the prediction model.

Tools:

The following resources/Tools are required for the successful completion of the project:

1. Python programming environment with necessary libraries (Beautiful Soup, sci-kit-learn, Flask, etc.).
2. Access to oladoc.com or relevant web data sources.

Supervisor:

Name: Komal Khawar
Email ID: komal.khawer@vu.edu.pk
Skype ID: kom.kk

Sentiment Analysis of Hotel Reviews and Recommendation

Project Domain / Category

Sentiment Analysis, NLP / Software Application

Abstract / Introduction

Everyone has an opinion about the things they use in their daily life, similarly in this age of digitization users share their views about products, hotels, news and other topics on web in the form of reviews, blogs and comments etc. Many user read those reviews before making a decision like to but a product, watching a movie, booking a hotel or going to a place for outing. Review contains user's opinion about product, event, place or topic, and it is difficult for web users to read and understand contents from large number of available reviews. Opinion Mining for Hotel Review system that detects hidden sentiments in feedback of the customer and rates the feedback accordingly.

The System takes review of various hotels based on the opinion of different user and will specify whether the specific hotel is good, bad, or worst. For this you have to create database of sentiment based keywords along with positivity or negativity weight in database and then based on these sentiment keywords mined in user review is ranked. System will use database and will match the review with the keywords in database and will rank the review. System will rate the hotel based on the rank of review. The role of the admin is to add keywords in database. This application is useful for those who are going to visit a new place and those who travel often. Using this application User will get to know which hotel is best and suitable for them. Users can decide which hotel to accommodate before they reach the place.

Functional Requirements:

In this project you are required to develop an application to recommend hotels to the user based on their requirements.

Data Set:

First you will be provided with the incomplete data set and you have to complete and refine the dataset. You have to take the reviews of relevant hotel form the Tripadvisor, link of reviews page of each hotel is already provided. You have to go to that page and copy the reviews into your dataset file. Make sure you have both the review text and corresponding ratings or labels (e.g., star ratings or sentiment labels).

Data Preprocessing:

Clean and preprocess the data to prepare it for sentiment analysis. You have to perform following preprocessing steps:

- **Text normalization:** Lowercasing, removing special characters.
- **Tokenization:** Splitting text into individual words or tokens.
- **Stop word removal:** Eliminating common words that do not carry significant sentiment information.
- **Stemming or Lemmatization:** Reducing words to their base form.

Sentiment Analysis:

The system will analyze the prepared dataset by performing the following tasks.

- Extract the positive, negative and neutral reviews about each hotel.
- Create a Word Cloud for positive, negative and neutral words for each hotel.
- Calculate the sentiment score for reviews of each hotel.
- Assign the sentiment label to each hotel.
- Identify which hotel has most positive reviews.
- Identify which hotel has most negative reviews.
- Identity the best and worst hotel based on food, location, hotel services, view, Price and payment policies, and availability of rooms.
- You need to create graphs, bar charts etc. using R tool.

Hotel Recommendation:

Using this system one will be able to select/book hotel according to their requirements. After the analysis the system will give list of hotel best, average or bad hotels.

- System ranks the reviews based on the weightage of the keywords in database.
- Important and useful information can be extracted from reviews through opinion mining and summarization process

Note:

- **More Functional requirements can be added in each deliverable.**
- **A detailed document for each deliverable, tools, and libraries to be used will be provided later after selection of project.**

Useful Link:

https://www.kaggle.com/datasets/joebeachcapital/hotel-reviews/data
https://www.tripadvisor.com/

Tools:

- Windows OS
- R software
- Python
- Online sentiment analysis tool

Supervisor:

Name: Rizwana Noor
Email ID: rizwana.noor@vu.edu.pk
Skype ID: rizwana.noor77

Sentiment Analysis using Machine Learning for Roman Urdu

Project Domain / Category

Data Science/Machine Learning

Abstract / Introduction

In a world driven by digital communication, understanding the sentiments expressed in text has become a critical aspect of decision-making, whether it's for business intelligence, social monitoring, or customer service. However, sentiment analysis in languages other than English, especially in non-Latin scripts, poses unique challenges. This project, titled "Sentiment Analysis using Machine Learning for Roman Urdu," addresses these challenges and aims to develop a machine learning system capable of accurately classifying text written in Roman Urdu into positive or negative sentiments.

Functional Requirements:

Admin (Student) will perform all these (Functional Requirements) tasks.

1. **Data-Collection**
   - For this project, student will collect data from any social media platform (such as YouTube, Facebook, Twitter, or Instagram) to detect abusive language. Dataset must contain at least 5000 comments. The data set is shared in the link below for the idea.
2. **Pre-processing**
   - As most of the data in the real world are incomplete containing noisy and missing values. Therefore student have to apply pre-processing on data. In pre-processing, student will *normalize* the data set, handle *stop words, missing values*, and *noise & outliers,* and remove *duplicate values.*
3. **Feature Extraction**
   - After the pre-processing step, student will apply the feature extraction method. Student can use Term Frequency - Inverse Document Frequency (TF-IDF), Uni-Gram (1-Gram), Bi-Grams (2-Grams), Tri-Grams (3-Grams), or N-Grams feature extraction method.
4. **Train & Test Data**
   - Split data into 75% training and 25% testing data sets.
5. **Machine learning Techniques**
   - Student must use at least three *classifiers/models* (e.g. Naïve Bayes, Naïve Bayes Multinomial, Poly Kernel, RBF Kernel, Decision Tree, Random Tree or Random Forest Tree etc.) of three different *machine learning techniques/algorithms*.
6. **Confusion Matrix**
   - Create a *confusion matrix* table to describe the performance of a classification model.
7. **Accuracy Evaluation**
   - Find the accuracy of all techniques and compare their accuracy.
   - This project will also tell us which machine learning technique is better to detect abusive language.

Tools/Techniques:

- Anaconda (Python distribution platform)
- Jupiter Notebook (Open source web application)

- Python (programming language)
- Machine Learning (Technique)

Prerequisite:
Artificial Intelligence, Machine Learning, and Natural Language Processing Concepts,
"Students will cover a short course relevant to the mentioned concepts besides SRS and Design initial documentation or see the links below."

Helping Material:
Python:
https://www.python.org/
https://www.w3schools.com/python/
https://www.tutorialspoint.com/python/index.htm

Feature Extraction Method*:*
https://towardsdatascience.com/feature-extraction-techniques-d619b56e31be
https://www.analyticsvidhya.com/blog/2021/04/guide-for-feature-extraction-techniques/
https://towardsdatascience.com/tf-idf-for-document-ranking-from-scratch-in-python-on-real-world-dataset-796d339a4089
https://www.analyticsvidhya.com/blog/2021/07/feature-extraction-and-embeddings-in-nlp-a-beginners-guide-to-understand-natural-language-processing/
http://uc-r.github.io/creating-text-features

Machine Learning Techniques:
https://towardsdatascience.com/machine-learning-an-introduction-23b84d51e6d0
https://towardsdatascience.com/top-10-algorithms-for-machine-learning-beginners-149374935f3c
https://towardsdatascience.com/10-machine-learning-methods-that-every-data-scientist-should-know-3cc96e0eeee9
https://towardsdatascience.com/machine-learning-classifiers-a5cc4e1b0623
https://www.youtube.com/watch?v=fG4e4TUrJ3E
https://www.youtube.com/watch?v=7eh4d6sabA0

Dataset:
https://drive.google.com/file/d/1Rz97GPT1R5t_aleNBd7T2QEwUlzSJUbj/view?usp=sharing

Supervisor:
Name: Tayyab Waqar
Email ID: tayyab.waqar@vu.edu.pk
Skype ID: maliktayyab786_1

Student Feedback Analysis using Python

Domain/Category

AI/ML

Abstract

Evaluation of a class and the instructor by students towards the end of each semester has now become a norm in higher education institutions. The prime purpose of gathering students feedback is to assess and improve the teaching quality. The feedback helps instructors to refine their teaching methodology and enables them to better understand the students perspective Course and Teacher evaluation at the end of a semester by the students has now become a custom in higher education institutions. The major purpose of this activity is to assess and improve the teaching quality. This feedback can help teachers to refine their teaching methodology and understand the student's perspective better. Educational data mining can facilitates educational institutions in discovering useful patterns and apply them to improve the overall quality of education. Analysis of student's feedback can help institutions improve student's learning abilities in the classroom. This python-based Student Feedback Review System helps in identifying sentiments from student reviews, and it further helps in generating the summary of feedback. India possesses the second largest educational system in the world. Government educational agencies like UGC and AICTE are placing a lot of emphasis on institutions to maintain Student Response Systems and Student Feedback Systems and insist them to take necessary measures based on the feedback from the students to improve the quality of education. It is crucial to understand the patterns generated by student feedback data to effectively improve the performance of the institution. There is also a requirement to automate the student feedback system in order to handle a large amount of data and analyse them effectively India possesses the second largest educational system in the world. Government educational agencies like UGC and AICTE are placing a lot of emphasis on institutions to maintain Student Response Systems and Student Feedback Systems and insist them to take necessary measures based on the feedback from the students to improve the quality of education. It is crucial to understand the patterns generated by student feedback data to effectively improve the performance of the institution. There is also a requirement to automate the student feedback system in order to handle a large amount of data and analyse them effectively India possesses the second largest educational system in the world. Government educational agencies like UGC and AICTE are placing a lot of emphasis on institutions to maintain Student Response Systems and Student Feedback Systems and insist them to take necessary measures based on the feedback from the students to improve the quality of education. It is crucial to understand the patterns generated by student feedback data to effectively improve the performance of the institution. There is also a requirement to automate the student feedback system in order to handle a large amount of data and analyse them effectively

Functional Requirements

The system has 2 major modules with their sub-modules as follows:

Admin:

- The admin can log in to the system using their username and password.
- They can view, add, update or delete Course, Subject and Faculty from the system and they can assign subjects the faculty.
- The admin can view the feedback summary and can apply a filter to sort by course.
- Admin can search faculty by their names and also view the faculty list.
- They can view a question wise feedback list and average ratings.

Faculty:

- The faculty can log in to the system using a username and password.
- The faculty can apply filters by course and can view the summary of the feedback and different parameters.

Data Set

Prepare a dataset for Computer Science courses for the BSCS Degree Program. One faculty member can teach more than one course at a time. The format of the evaluations forms will be provided and students need to complete the dataset for all the courses and feed into the application. Convert the data file into csv file.

Sentiment Analysis

The system will analyse the prepared dataset by performing the following tasks.

- Apply pre-processing on data by cleaning and handling contractions, converting text to lower case, removing stop words, punctuations, hashtags, numbers/digits and special characters and then tokenizing and lemmatizing the text.
- Calculate the sentiment score and subjective score for each feedback comment.
- Assign the sentiment label to each record.
- Create a Word Cloud for positive, negative and neutral words for each course.
- Analyse the frequency of specific keywords or phrases in the feedback.
- Text clustering to group similar feedback together.
- Identify which faculty member has most positive comments.
- Which course has the most negative students?
- Students are satisfied with which course content?
- According to the students, which is the most annoying faculty member?
- Identify the most difficult course.
- Calculate the Summary of the course wise feedback regarding teaching methodology.
- You need to create graphs, bar charts etc. using R tool.

The Admin and faculty members will be able to view the question wise analysis.

Software Requirements:

- Windows Xp, Windows 7(ultimate, enterprise)
- MS Excel
- Visual studio 2010
- Python
- R Software

Supervisor:

Name: Amna Bibi
Email ID: amna.bibi@vu.edu.pk
Skype ID: aamna.bibi26

IoT - Enabled Egg Incubator & Birds Brooder with Sensors Integration

Project Domain / Category

Digital Logic Design

Abstract / Introduction

We propose the development of an advanced and efficient Egg Incubator and Bird Brooder system. This project aims to provide a solution for hatcheries, poultry farms, and enthusiasts who require precise temperature and humidity control during egg incubation with egg rotation mechanism and a nurturing environment for newly hatched birds. We propose the development of an IoT-enabled birds' incubator with a comprehensive sensor suite, including light, temperature, humidity, and egg rotator for real-time monitoring. This incubator will provide a controlled and monitored environment for avian breeding, enabling bird enthusiasts, breeders, and researchers to maintain optimal conditions for hatching and nurturing bird eggs.

The system will be designed to fetch sensor data through Wi-Fi or GSM, with a dedicated **Android application** for real-time monitoring and control of the incubation environment.

Additionally, the sensors in the incubator can be preset to maintain specific environmental conditions, such as a consistent temperature or humidity level and egg rotation for incubation.

Project Overview

Objectives

1. Develop an IoT-enabled bird incubator equipped with essential sensors (light, temperature, humidity & egg rotation system) for real-time monitoring.
2. Create an Android application for remote monitoring and control of the incubator.
3. Ensure real-time data feedback and alerts to users for precise management of the incubation environment.
4. Implement options for data communication through Wi-Fi or GSM for broader connectivity.
5. Enable preset settings on the sensors to maintain specific environmental conditions, facilitating precise bird breeding.

Functional Requirements:

Our Complete System will have:

IoT - Enabled Incubator & Brooder:

The incubator & brooder will feature the following components:

1. **Temperature Sensor:** A high-precision temperature sensor to monitor and maintain the incubator's temperature within the desired range. Settings can be preset to maintain specific temperature levels.
2. **Humidity Sensor:** A humidity sensor to regulate the humidity level and ensure optimal conditions for hatching. Humidity presets can be established.
3. **Humidifier:** Humidifier for humidity level maintenance.
4. **Egg Rotation:** A motorized egg rotation tray for rotating eggs.

5. **Light Sensor:** A light sensor to monitor lighting conditions, with the ability to simulate day-night cycles.
6. **Microcontroller:** A microcontroller (e.g., Arduino or Raspberry Pi) to control the sensors, camera, and incubator environment.
7. **Heating and Cooling System:** A heating element and cooling mechanism to adjust the temperature as needed.
8. **Communication Module:** Wi-Fi and GSM modules for versatile data communication options.
9. **Control Unit:** Manual control unit mounted on incubator & brooder for real time readings and updating the values.

Android Application

The Android application will provide the following features:

1. **Real-time Monitoring:** Display real-time sensor data, including temperature, humidity, and light levels.
2. **Remote Control:** Allow users to adjust temperature, humidity, and light settings remotely.
3. **Alerts and Notifications:** Send alerts and notifications to users in case of deviations from set parameters.
4. **Data Logging:** Store historical data for analysis and research purposes.
5. **User Profiles:** Enable multiple users to access the incubator with varying levels of control.

Hardware Components:

1. **Microcontroller:** (e.g., Arduino, Raspberry Pi) - To control and manage the sensors and various incubator functions.
2. **Temperature Sensor:** (e.g., DHT22, DS18B20) - To monitor and control the temperature within the incubator.
3. **Humidity Sensor:** (e.g., DHT22, HIH-6130) - To monitor and control humidity levels within the incubator.
4. **Humidifier:** Humidifier for humidity maintenance.
5. **Motorized Egg rotation:** Stepper motor-based egg rotatory trays for egg rotation.
6. **Light Sensor:** (e.g., LDR or light-dependent resistor) - To monitor lighting conditions, control light levels, and simulate day-night cycles.
7. **Heating and Cooling System:** - A combination of heating elements (heaters) and cooling mechanisms (fans or coolers) to regulate temperature as needed.
8. **Communication Module:** - Wi-Fi or GSM modules to enable data communication, remote access, and control.
9. **Power Supply:** - Appropriate power supply components for the microcontroller, sensors, heating/cooling systems, and communication modules.

Tools:

It is an open project. You can use any Mobile Application Development platform. You can use any controller/any Single-Board Microcontroller kit.

Supervisor:

Name: Waqar Ahmad
Email ID: waqar.ahmad@vu.edu.pk
Skype ID: engr.waqar.ahmad

Smart Water Management System: IoT-Based Tank Monitoring and Pump Automation

Project Domain / Category

Internet of Things

Abstract / Introduction

Water is a valuable resource and an essential daily necessity in households. Maintaining the water level in home tanks can be a challenging task, and the sudden depletion of water from taps, particularly when guests are present, can lead to inconvenience. Manual water tank filling is not only labor-intensive but also prone to water wastage due to overflow or damage to the pump when water is unavailable. In light of these common household challenges, this project aims to create an IoT-based solution for automating the water tank monitoring, filling, and pump operation process.

Functional Requirements:

In this project, students are expected to develop a smart IoT solution using development boards, sensors, and a mobile application. There are two main components of this project, each with its set of essential functional requirements:

(a) **Automated System**: Automated system can be implemented on any IoT development boards and shall work as

1. Continuously monitor the water level in the roof tank using sensors.
2. Automatically start the water pump when the water level falls below a predefined threshold in the roof tank.
3. Monitor water flow in the pipe and stop the pump when there is no water flow (indicating that the ground tank is empty).
4. Automatically stop the water pump when the water level rises above a predefined threshold to prevent water overflow.

(b) **Companion Mobile App**: Companion mobile app that shall allow users to

1. Monitor current water level in the roof tank
2. Manually turn on/off the water pump from the app as and when desired.

Tools:

Students are free to choose any IoT development board (e.g., ESP, Raspberry Pi) and a mobile app development platform that they are comfortable with. However, it is recommended to use the ESP32 for the hardware component (as it is cost-effective and suitable for the project) and Blynk for mobile app development (known for its user-friendliness).

Important Notes:

1. This project combines both hardware and software components. Initially, students are expected to create a working prototype using buckets and a 5V pump for safety.
2. The project can be further extended to work with a 220V pump using relays.
3. Enthusiastic students who can attend in-person meetings at the VU-Peshawar campus for project updates and development progress are encouraged to take on this project.
4. Students are responsible for purchasing the necessary hardware components, and Virtual University will not cover these costs.

Supervisor:

Name: Dr. Israr Ullah
Email ID: israr.ullah@vu.edu.pk
Skype ID: israrullahkk

Brain Tumor Segmentation

Project Domain / Category

Artificial Intelligence/Image Processing

Abstract / Introduction

Image processing is a powerful field of study that has numerous real-world applications. It involves the manipulation of digital images to extract useful information or enhance specific features. One of the critical applications of image processing is medical image analysis, where it plays a pivotal role in diagnosis, treatment, and research. In this project, we aim to explore the fascinating realm of image processing and its applications in the healthcare domain, specifically in the context of brain tumor segmentation.

This project centers on the realm of medical imaging, specifically the challenging task of brain tumor segmentation using deep learning techniques. Brain tumors are abnormal growths of tissue within the brain that can be cancerous or non-cancerous. Accurate and early diagnosis is essential for timely treatment and improved patient outcomes.

Functional Requirements:

In this project, we will leverage image processing and deep learning techniques to address the following objectives:

1. **Data Collection and Preprocessing:** Gather a diverse dataset of brain MRI scans, ensuring data quality and integrity. Preprocess the images to enhance their suitability for further analysis. Import the image dataset of Brain MRI scans from described link.
2. **Dataset Splitting:** To facilitate model training and evaluation, we will split the dataset into distinct sets for training, validation, and testing. This step ensures that the deep learning model's performance is rigorously assessed and prevents overfitting.
3. **Deep Learning Model Development:** We will design, implement, and fine-tune deep learning models, such U-Nets, to accurately segment brain tumors from MRI images.
4. **Model Evaluation:** We will establish robust evaluation metrics to assess the performance of the deep learning models, ensuring that the segmentation results are precise and reliable.
5. **DataSet:** For this project you need to use BraTs2019 Dataset. https://www.med.upenn.edu/cbica/brats2019/data.html

Important links and Tutorials:

- **Python**
  - https://www.w3schools.com/python/
  - https://www.tutorialspoint.com/python/index.htm
- **Image processing**
  - https://regenerativetoday.com/some-basic-image-preprocessing-operations-for-
  - beginners-in-python/
  - https://www.section.io/engineering-education/image-preprocessing-in-python/
  - https://www.tensorflow.org/tutorials/load_data/images

- **Deep Learning**
    - https://www.simplilearn.com/tutorials/deep-learning-tutorial/guide-to-building-powerful-keras-image-classification-models
    - https://www.analyticsvidhya.com/blog/2020/02/learn-image-classification-cnn-convolutional-neural-networks-3-datasets/

Tools:

Language: Python (Only python language)
Framework: Anaconda
IDE: JupyterNotebook, Pycharm, Spyder, Visual Studio Code, etc.
You can also use Google colab environment or google cloud.

Note: VU will not provide you any resources to buy any Software, Framework or any services if used in this project. Student has to manage all the project on its own.

Kindly read the proposal carefully and decide if you have completely understood the project requirements before selecting the project. Please feel free to discuss any project- related questions before selecting it

Supervisor:

Name: Muhammad Hashir Khan
Email ID: hashir.khan@vu.edu.pk
Skype ID: hashir.khan9996

Detection of Outsiders in Live Video Using Pre-trained CNN

Project Domain/Category

Image Processing

Abstract / Introduction

Image processing is a dynamic field encompassing a range of techniques used to extract meaningful information from images, contributing to improvements in various industries. While image processing has been applied in fields like medical science, defense, and agriculture, we now propose its application in a security and surveillance context. This project aims to develop an image processing system using pre-trained Convolutional Neural Networks (CNN) to detect outsiders or intruders in live video streams, with a focus on real-time detection and alerting.

The primary objective of this project is to create a robust system that can identify outsiders in live video feeds. The functional requirements for achieving this are as follows:

Functional Requirements:

1. Gather a diverse dataset of live video streams, including normal scenarios and instances of outsider presence. This dataset should mimic real-world settings where intrusion might occur.
2. Preprocess the video data to extract frames, reduce noise, and normalize images for consistent analysis.
3. Utilize a pre-trained CNN model (e.g., VGG16, ResNet, or Inception) to identify outsiders in the video streams.
4. Develop an algorithm that can process live video streams in real-time, extract frames, and apply the pre-trained CNN model for outsider detection.
5. Implement an alerting mechanism, such as triggering alarms, sending notifications, or integrating with a security system, to notify relevant personnel when an outsider is detected.
6. Create a user-friendly interface for users to interact with the system, view live video feeds, and monitor alerts.
7. Test the system on a wide range of live video streams, including scenarios with varying lighting conditions, weather, and camera angles. Evaluate the system's accuracy, false positives, and false negatives.
8. Continuously fine-tune the pre-trained CNN model using additional data and adapt to changing conditions, aiming to enhance the system's accuracy and adaptability.

Note: Virtual University of Pakistan will not provide any kind of hardware for this project, student must arrange required hardware by himself/herself.

Tools & Technologies:

Preferred tool and technology: MATLAB (Any latest version of MATLAB)

Supervisor:

Name: Noor Rahman
Email ID: noor.rahman@vu.edu.pk
Skype ID: mahsud-cs619

Image Enhancement/Restoration System for Restoring Old or Damaged Photographs

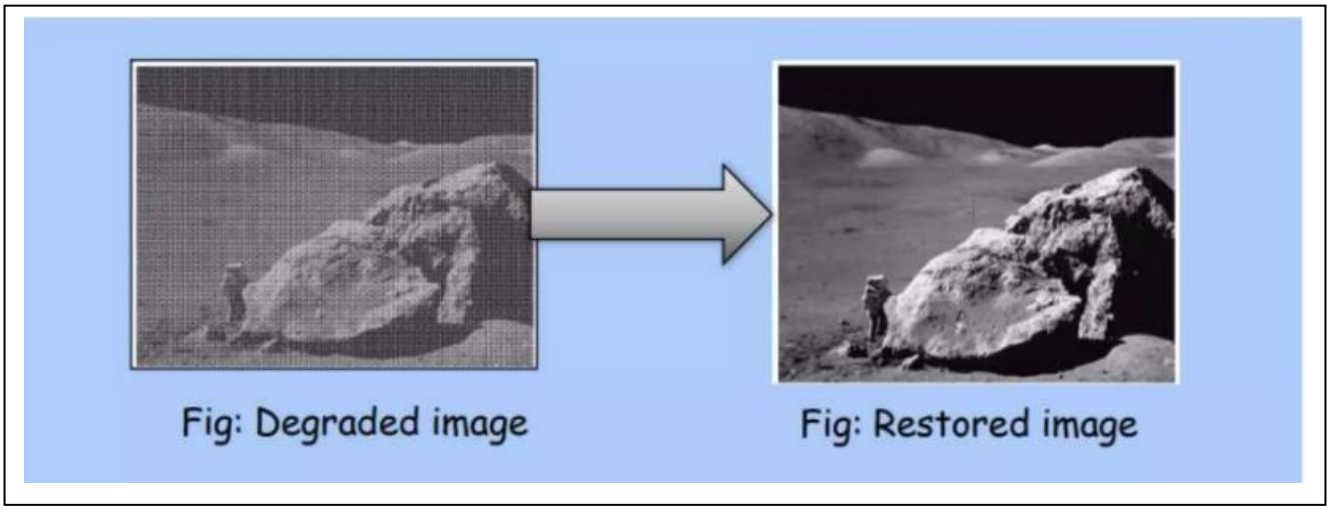
Project Domain / Category

Artificial Intelligence/Image Processing

Abstract / Introduction

In today's digital age, preserving and restoring old or damaged photographs is an essential task for archivists, historians, and individuals looking to relive cherished memories. Image enhancement techniques play a crucial role in this process by removing noise, blur, and other imperfections. This project aims to develop sophisticated algorithms for the automatic restoration of photographs, making them clearer, crisper, and more visually appealing.

Image restoration attempts to restore images that have been degraded. It is used to recover original image from degraded with prior knowledge of degradation process. It involves modelling of degradation and applying the inverse process in order to recover the original image. Although the restore image is not the original image, its approximation of actual image. Following image is used to tell you about the concept of image restoration.



Objectives

1. **Algorithm Development:** Develop an image enhancement algorithms capable of addressing the following imperfections: Noise reduction: Remove various types of noise, such as salt-and-pepper noise, Poison noise, Gaussian noise, and speckle noise.
2. **User-Friendly Interface:** Create a user-friendly interface to enable non-technical users to apply these algorithms to their photographs easily. This may include developing a desktop application or a web-based tool. User can upload the distorted image and your system must be able to restore that image.
3. **Efficiency and Speed:** Ensure that the algorithm is computationally efficient and capable of processing large volumes of images quickly. This is particularly important for applications with extensive image archives.

Methodology

1. **Data Collection:**
   Gather a dataset of old or damaged photographs that represent the types of images you intend to restore. Ensure that the dataset is diverse, in a suitable format, resolution for your project and well-documented. The dataset should include images with salt-and-pepper noise, Poisson noise, Gaussian noise, and speckle noise. Ensure the dataset includes both the original, clean images, and their degraded counterparts.
2. **Data Pre-processing:**
   In this step, you have to clean and prepare the data for analysis. Dataset can be pre-processed by removing duplicates, organizing images, filtering, and resizing them if necessary.
3. **Noise Analysis (if applicable):**
   Analyze the type and characteristics of noise present in the degraded images. Common types of noise include salt-and-pepper, Gaussian, Poisson, and speckle noise.
4. **Select Tools and Libraries:**
   Choose the appropriate image processing tools and libraries. Common choices include OpenCV, MATLAB, Python (with libraries like Pillow and scikit-image), or specialized software depending on your needs.
5. **Research:** Begin with an extensive review of existing image enhancement and restoration techniques and identify the most effective and efficient methods.
6. **Algorithm Selection:**
   Choose or design appropriate image enhancement and restoration algorithms. These may include denoising, inpainting, deconvolution, color correction, and super-resolution methods.
7. **Image Enhancement and Restoration:**
   Apply the selected algorithms to the damaged photographs to improve their quality. This step may involve a combination of techniques for different types of damage.
8. **Quality Assessment:**
   Evaluate the quality of the restored images using appropriate metrics. Compare the restored images to the originals to ensure a visually pleasing result.
9. **User Interface (UI) Design (if applicable):**
   If the project is intended for non-technical users, design an intuitive user interface for uploading, processing, and downloading images.
10. **Validation and Testing:**
    Test the restoration system on a separate validation dataset or unseen degraded images to ensure it generalizes well to new data and performs consistently.

Helping Material:

https://www.coursera.org/projects/image-processing-with-python
https://www.classcentral.com/course/youtube-image-processing-with-python-54897
https://neptune.ai/blog/image-processing-python

Note: Kindly read the following guidelines before choosing the project.

1. Kindly read the proposal carefully and decide if you have completely understood the project requirements before selecting the project.
2. You have to implement the requirements mentioned in project proposal completely. You are not allowed to add irrelevant and un-necessary requirements.
3. You have to implement the project in mentioned tools and technology.
4. Kindly do not request to use php or html for image processing project.
5. Do not ask to share dataset because it is your task to find the appropriate dataset.
6. Student must have knowledge of image processing techniques.
7. Please feel free to discuss any project- related questions before selecting it.

Supervisor:
Name: Fizzah
Email ID: fizzah@vu.edu.pk
Skype ID: fizzahbhatti2020@outlook.com

Brain Tumor Detection Through Transfer Learning

Project Domain / Category

Image processing

Abstract/Introduction

Brain tumors are a critical health concern with potentially life-threatening consequences. Early and accurate detection of brain tumors is crucial for timely medical intervention. This project proposal aims to explore the application of deep learning techniques, specifically transfer learning, to improve the efficiency and accuracy of brain tumor detection in medical images.The proposed research project focuses on the application of transfer learning and deep learning techniques to enhance brain tumor detection in medical images. By leveraging pre-trained models and fine-tuning them for this specific task, this research aims to contribute to early and accurate diagnosis of brain tumors, ultimately improving patient outcomes and healthcare practices.

This project involves the following steps:

1. Collect a diverse dataset of medical images, including MRI.You may use the provided link for the dataset.
2. Preprocess the dataset, ensuring uniformity in terms of image size, format, and quality.
3. Select pre-trained deep learning models suitable for transfer learning, such as including Visual Geometry Group 16 (VGG16), InceptionV3, VGG19, ResNet50, InceptionResNetV2, and Xception. You should select two well-established pre-trained models.
4. Fine-tune the selected model architecture for brain tumor detection.
5. Train the deep learning model on the labeled medical image dataset, using the knowledge transferred from the pre-trained model.
6. Evaluate the performance of the transfer learning-based model on a separate test dataset, measuring metrics like sensitivity, specificity, and ROC curves.

Functional Requirements:

Your system must fulfill the following requirements:

- Preprocess the data, ensuring uniformity in terms of image size, format, and quality.
- In the preprocessing stage, it is essential to address and eliminate any noise present in the datasets to enhance the accuracy of the model.
- Develop and fine-tune deep learning models for brain tumor detection by leveraging transfer learning from pre-trained models.
- Evaluate the performance of transfer learning-based models on a diverse dataset of medical images, considering factors such as sensitivity, specificity, and false-positive rates.
- Perform comparative analysis of two selected transfer learning models applied to the task of brain tumor detection, with the objective of selecting the most effective model for this critical application.

Tools:

The following tools can be used for developing the above project:

- Anaconda
- Numpy
- Jupiter Lab
- Google Colab

Dataset Download Link:

You can download the dataset from:
Brain Tumor MRI Dataset:
https://www.kaggle.com/datasets/masoudnickparvar/brain-tumor-mri-dataset

Supervisor:

Name: Laraib Sana
Email ID: laraib.sana@vu.edu.pk
Skype ID: laraib.sana

Real-time Facial Landmark Detection

Project Domain / Category

Image Processing

Abstract / Introduction

Facial landmark detection is a computer vision task in which a model needs to predict key points representing regions or landmarks on a human's face – eyes, nose, lips, and others. Facial landmark detection is a base task which can be used to perform other computer vision tasks, including head pose estimation, identifying gaze direction, detecting facial gestures, and swapping faces.

This project includes developing a real-time facial landmark detection system using Python. This project will involve identifying key points on a person's face, such as the eyes, nose, and lips, in images. This project will provide a valuable tool for various computer vision applications, making it easier to detect and analyze facial landmarks in real-time, opening the door to a wide range of possibilities in fields like biometrics, human-computer interaction, and emotion recognition.

Functional Requirements:

1. **Data Collection**
   Gather a dataset of facial images with annotated landmarks. You can use publicly available datasets like 300-W, COFW, or create your own dataset.
2. **Preprocessing**
   Resize and Normalize the data to enhance the accuracy of landmark detection.
   Augment the dataset with transformations like rotation, scaling, and flipping for better model generalization.
3. **Model Selection**
   Choose a deep learning model architecture suitable for facial landmark detection, such as a Convolutional Neural Network (CNN). Pre-trained transfer learning models like ResNet or MobileNet can also be used.
4. **Data Splitting:**
   Split the dataset into training, validation, and test sets to train and evaluate the model's performance.
5. **Model Training**
   Train the selected model using the training dataset. The loss function should be designed to minimize the difference between predicted and ground-truth landmark locations.
6. **Validation and Hyperparameter Tuning**
   Validate the model's performance using the validation set and fine-tune hyperparameters like learning rate, batch size, and network architecture to achieve the best results.
7. **Testing and Evaluation**
   Assess the model's accuracy on the test dataset to ensure it generalizes well to unseen data. Confusion Metrics can be used to evaluate performance.
8. **Real-time Implementation**
   Integrate the trained model into a real-time Python application using libraries like OpenCV for video capture and display. The application should continuously detect facial landmarks from a webcam feed.

9. **Face Recognition**
   Implement face recognition using the detected facial landmarks. You can use techniques like face embeddings or existing libraries like OpenCV or dlib for face recognition.
10. **User Interface**
    Create a user-friendly interface for the application, allowing users to select functionalities of face recognition.

Important links and Tutorials:

- Python
  - https://www.w3schools.com/python/
  - https://www.tutorialspoint.com/python/index.htm

- Image processing
  - https://regenerativetoday.com/some-basic-image-preprocessing-operations-for-beginners-in-python/
  - https://www.section.io/engineering-education/image-preprocessing-in-python/
  - https://www.tensorflow.org/tutorials/load_data/images

- Deep Learning
  - https://www.simplilearn.com/tutorials/deep-learning-tutorial/guide-to-building-powerful-keras-image-classification-models
  - https://www.analyticsvidhya.com/blog/2020/02/learn-image-classification-cnn-convolutional-neural-networks-3-datasets/

- Transfer learning
  - https://towardsdatascience.com/transfer-learning-for-image-classification-using-tensorflow-71c359b56673
  - https://www.kaggle.com/code/kmkarakaya/transfer-learning-for-image-classification/notebook

Hardware Requirement:

- Processor –Core i3
- Hard Disk – 160 GB
- Memory – 12GB RAM
- Monitor

Tools:

Language: Python (Only python language)
Framework: Anaconda
IDE: JupyterNotebook, Pycharm, Spyder, Visual Studio Code, etc.

Supervisor:

Name: Madiha Faqir Hussain
Email ID: madiha.hussain@vu.edu.pk
Skype ID: madiha.akhtar74

Android Application for Women's Safety

Project Domain / Category

Mobile App / Cloud Computing

Abstract / Introduction

Android application for women's safety is a mobile application developed with the primary objective of ensuring the safety and security of women in situations where they feel threatened or insecure.

This is more than just an application; it's a movement towards a safer world for women.

This application addresses real-world security challenges and provides peace of mind. When activated by the user(women), it will immediately connect her to the nearest police station and notifying her trusted contacts i.e., parents/guardians with real-time location information.

Functional Requirements:

1. There should be separate interfaces for women, police representatives and parents/guardians.
2. User registration and login: The application should allow all types of users to create an account and log in using their credentials.
3. Different interfaces should open based on the type of user.
4. Emergency Button: The application must have a prominent and easily accessible emergency button on the user interface.
    a. When the emergency button activated, application send notification to nearest police station and trusted contacts i.e. parents/guardians.
    b. The application must access the device's GPS to determine the user's real-time location.
    c. the application should continuously share the user's real-time location with police station and parents/guardians.
5. User profile: Users should be able to update their profile information, including emergency contacts.
6. Safety Tips and Resources: The application should an interface showing safety tips and information related to harassment prevention and personal security.

Tools:

Students may use Android studio or any other IDE as per his/her choice but he/she will have to use JAVA programming language. It is also required that data storage and retrieval be conducted via Google's Cloud platform, specifically Firebase.

In regard to computational resources, any expenses incurred by students will not be covered by the Virtual University of Pakistan as students are responsible for managing such expenses by themselves.

NOTE :

- Before selecting the project, get complete knowledge of the project.
- Applications should have interactive and attractive user interfaces.
- In case of queries, discuss with the Project Supervisor before selecting in order to avoid ambiguities.

Supervisor:
Name: Azhar Ali Khaskheli
Email ID: azhar.ali@vu.edu.pk
Skype ID: azharkhaskheli / https://join.skype.com/invite/aOjUXrsu7tCw

Android Campus Recruitment System

Project Domain / Category

Mobile Application

Abstract / Introduction

Campus recruitment is a process where companies visit colleges and universities to hire students for various job roles. However, this process can be challenging and time-consuming for both students and recruiters, as they have to deal with multiple applications, interviews, and assessments. Moreover, students may not have access to all the available opportunities or information about the companies and their requirements.

The Android Campus Recruitment System is a mobile application that aims to simplify and streamline the campus recruitment process for both students and recruiters. With this system, students can:

- Browse and search for job opportunities posted by various companies.
- Apply for jobs and upload their resumes and other documents.
- Schedule and attend online interviews and tests.
- Track their application status and receive feedback from recruiters.
- Manage their profile and preferences.

Recruiters can:

- Post job vacancies and specify their criteria and expectations.
- View and shortlist candidates based on their qualifications and skills.
- Conduct online interviews and tests with candidates.
- Provide feedback and offer letters to selected candidates.
- Manage their company profile and preferences.

Functional Requirements:

The Android Campus Recruitment System provides a convenient and efficient way for students and recruiters to connect and communicate during the campus recruitment process. The functional requirements of the Android Campus Recruitment System are as follows:

1. **User registration and login:**
    - The system should allow users to register and login using their email and password.
    - Users should also be able to choose their role as either student or recruiter.
2. **Job posting and browsing:**
    - The system should allow recruiters to post job vacancies with details such as job title, description, salary, location, eligibility criteria, etc.
    - The system should also allow students to browse and search for job opportunities based on various filters such as company name, job role, location, etc.
3. **Job application and submission:**
    - The system should allow students to apply for jobs by uploading their resumes and other documents.
    - The system should also allow recruiters to view and download the applications submitted by students.
4. **Test creation and taking:**

- The system should allow recruiters to create online tests with questions of different types such as multiple-choice questions.
- The system should also allow students to take the tests online within a specified time limit.

5. **Interview scheduling and conducting:**
    - The system should allow recruiters to schedule online interviews with selected candidates by sending them invitations via email.
    - The system should also allow students to accept or decline the invitations and attend the interviews using video or audio calls.
6. **Feedback and offer letter generation:**
    - The system should allow recruiters to provide feedback to candidates after the tests or interviews.
    - The system should also allow recruiters to generate offer letters for selected candidates with details such as job role, salary, joining date, etc.
7. **Profile and preference management:**
    - The system should allow users to manage their profile information such as name, email, phone number, etc.
    - The system should also allow users to set their preferences such as notification settings, password change, etc.

Tools:

- Android Studio (Java Language)
- Database (SQLite or Firebase)

Supervisor:

Name: Muhammad Hassaan
Email ID: m.hassaan@vu.edu.pk
Skype ID: live:muhammad.hassaan005

Android-Based Staff and Offender Records Management System for Police Department

Project Domain / Category

Android Application

Abstract / Introduction

Staff and Offender Records Management System for Police Department is an Android-based application consisting of hardware, software, networked devices, and information that serves as the backbone for any organization. This application collects data from various online systems and resources, processes the data, and generates reports to assist in making informed decisions.

Android-Based Staff and Offender Records Management System is used to convert the manual information system of the Police department into an online Android application. This app is capable of collecting online data from various police stations located in various districts of the province. The Police stations will connect to the portal through a VPN or App, using an authentication mechanism of username and password. The collected information includes the Police staff and criminal data that will be provided by the administrations of Police stations located in far-flung areas of the province.

This system will facilitate each level of management in the Police Department. Using this portal, the top, middle, and low-level management of Police gain information about police staff and criminals to improve their performance and carry out optimal decision-making for keeping peace in districts and provinces.

Functional Requirements:

User:

1. Log in to the system using authentication.
2. Search for District, Tehsil, and Police station information.
3. Input staff and criminal data at the police station level.
4. Search, edit, or delete data at the police station level.
5. Access and view staff and criminal data at Tehsil and District levels.
6. Generate reports at the police station level.
7. Create reports at the Tehsil level.
8. Produce reports at the District level.

Administrator Login:

An authorized admin can log in to the system:

1. Assign/update/delete the username and password of the end-users
2. Add the name of the District, Tehsil, and Police station
3. Edit/delete the name of the District, Tehsil and Police station
4. View/edit/delete the District, Tehsil-wise staff, and criminal data
5. View/edit/delete the police station-wise staff and criminal's data
6. Generate various reports about staff and criminals at different levels i.e. Police Station, Tehsil, or District level.

Tools:

- IDE: Android Studio (or any other mobile app development IDE)
- Programming Language: Android Java/Kotlin, XML for Layout/Interface design.
- Database: Online DBMS (Firebase, MySQL, or any other)
- Unified Modelling Language (UML): Microsoft Visio etc.

Supervisor:

Name: Irshad Nasir
Email ID: irshad.nasir@vu.edu.pk
Skype ID: irshadnasir304@yahoo.com (live: .cid.325c9aa99b0279e4)

Bakers and Confectionary Management Services App

Project Domain / Category

Mobile Application

Abstract/Introduction

Bakers and Confectionary Sales and inventory provides bakers and Confectionary management services to help clients achieve the highest quality customer outcomes and ensure the effectiveness of their food quality programs. The application Bakers and Confectionary Sales online Inventory must be well designed and engaged with the inventory control of different sales such as shopping cart, purchase, and production. The business can select workers' permanent/daily wages for different jobs and view their Inventory Control/production detail with a complete Account book and report. This platform can be run for pure business purposes, so proper reports are required for inventory sales, purchases, production, and accounts of bakers and Confectionary management services.

Functional Requirements:

1. Admin/system can add, modify, delete, and search staff permanent/daily wages by first name, Last name, CNIC, contact number, qualification, experience, and salary / daily wage.
2. Admin/system can add, modify, delete, and search/view shopping cart sales by date and Type.
3. Admin/system can add first name,
Lastname, Distributors CNIC, Distributors address, Distributors contact no,
and Distributor inventory.
4. Admin/system can add, modify, delete, and search/view reports of cash sales by date and Type.
5. Admin/system can add, modify, delete, and search/view reports of credit card sales by date and Type.
6. Admin/system can add, modify, delete, and search/view reports of Product inventory.
7. Admin/system can add, modify, delete, and search/view reports of purchase inventory.
8. Admin/system can add, modify, delete, and search/view reports of payments and transactions by dealers.
9. Admin/system can add, modify, delete, and search/view reports of payments and transactions by vendor.
10. Admin/system can add, modify, delete, and search enterprise complete accounts with reports.
11. Admin/system can add, modify, delete, and search/view reports of employees' jobs and payment records.
12. Customers can create their login and profile by first name, Last name, domain, address, contact no, and date of registration
13. Admin/system can add first name, Last name, vendor CNIC, vendor address, vendor contact no, and vendor inventory.

Non-Functional Requirements:

The mobile application must be Android-based, and its data is to be managed using SQLite. Also, the application should be easily accessible to users, secured, saleable and well-performing. Those criteria are what would make the application stand up from a simple application to a product that can be delivered and used by real-life clients. However, the focus is more on implementing the application using the new tools before considering these enterprise application features.

Tools:

Android Studio / Eclipse / NetBeans
Programming language (Front end: XML, Back-end: Java)
Database (SQLite or any modern database language)

Supervisor:

Name: Imran Akhtar
Email: Imran.akhtar@vu.edu.pk
Skype ID: msisl.net

Diet Planning App (Mobile)

Project Domain / Category

Mobile Application

Abstract / Introduction

The Diet Planning App is designed to help individuals plan and track their dietary intake in a convenient and personalized way. The app will provide users with tools to set dietary goals, discover healthy recipes, and monitor their nutritional intake to support their wellness and dietary objectives. This app will target a wide range of users who want to maintain a balanced diet, lose weight, gain muscle, or address specific dietary restrictions. This app empowers users to make informed dietary choices by providing easy access to nutritious recipes and meal planning tools. It encourages healthier eating habits, which can lead to improved overall health and well-being. Personalized Nutrition: By allowing users to set and customize dietary goals, the app ensures that individuals can tailor their meal plans to their specific needs, whether they are looking to lose weight, gain muscle, manage dietary restrictions, or simply maintain a balanced diet.

Functional Requirements:

The functional requirements for the Diet Planning App project:

- **User Registration:**
  - Users can create an account by providing essential information (phone, name, email, password).
  - Validate and secure user registration to prevent unauthorized access.
  - Must verify the user before completing the registration. The registration must be done by sending an OTP (one-time password) through SMS (on the entered phone number) or Email.

- **User Login:**
  - Registered users can log in using their login credentials.
  - Implement secure authentication to protect user accounts.

- **User Profiles:**

  - Users can create and update their profiles with personal details (age, gender, weight, height, activity level, dietary restrictions, goals).
  - Profile data should be editable, and users can choose to keep certain information private.

- **Goal Creation:**
  - Users can set dietary goals, such as daily calorie targets, macronutrient ratios (carbohydrates, proteins, fats), and other dietary restrictions (e.g., vegetarian, gluten-free).
  - Goals should be customizable and adaptable over time.

- **Recipe Search:**
  - Users can search for recipes by various criteria, including meal type, ingredients, dietary preferences, and cuisine.
  - Implement a search bar and filters for efficient recipe discovery.
  - Recipe Details:
  -
  - Users can view detailed recipe information, including ingredients, preparation steps, cooking time, and nutritional content.
  - Nutritional content should be displayed per serving.

- **Meal Creation:**
  - Users can plan meals by selecting recipes from the database.
  - The app should calculate the total nutritional content of planned meals.

- **Daily/Weekly Meal Plans:**
  - Users can create daily or weekly meal plans, including breakfast, lunch, dinner, and snacks.
  - The app should support meal planning for multiple days.

- **Nutritional Monitoring:**
  - Users can track the nutritional content of each meal, including calories, macronutrients, and essential micronutrients.
  - Display a summary of daily and weekly nutritional intake.

- **Weight Tracking:**
  - Users can track their weight over time and view their weight change progress.
  - Implement graphical representation of weight trends.

- **Goal Adjustment:**
  - Users can adjust dietary goals based on their progress and objectives.
  - Provide suggestions or prompts for goal adjustments.

Tools/Technical Details:

- **Platform:** Android
- **Development Tools:** Android Studio
- **Languages:** Java/Kotlin, Flutter
- **Database:** A cloud database for storing recipes and user data, possibly an API for retrieving nutritional information.

Supervisor:

Name: Waqas Ahmad
Email ID: waqas.ahmad@vu.edu.pk
Skype ID: waqas_vu

Health Care App

Project Domain / Category

Healthcare/Mobile App

Abstract / Introduction

Most of the people don't know which hospital and doctor is best for their specific disease. Reliable online medical sources provide general, easily understandable information about symptoms, treatment options, and common outcomes. When used properly, it can help you proactively identify a health problem, treat it over the-counter, and empower you to make good health-related decisions. Most of the people don't know which pharmacy has that medicine in less price so a **" Health Care"** app can help people to connect with best pharmacy with best price. The app connects the health service providers to clients and helps patients to seek all types of health services at one platform. The health service providers like doctors and medical equipment sellers can easily connect with patients and sell their services. Patients can avail all health care services like online consultation; foreign doctors assist for complex medical procedures, pharmacy services, hospital services at home using the app. All vendors will register on the app and buy subscription charges to offer their services on the app while patients will register on the app and avail services provided by vendors. The app would function as a connector between two users. Users could be an individual using the app to access healthcare services and could be the vendor providing the services. The user who will access the health care services through the app would enter our system as a patient and the user who will enter our system to provide health care services would be a vendor which include doctors, hospitals. Pharmacies, mortuaries, ambulance service providers and foreign doctors and hospitals etc.

Functional Requirements:

1. To connect patients to hospital providers and Pharmacy's within any geographical location.
2. To connect Patients to Ambulance services/Mortuary services within any geographical location.
3. Enable people to schedule appointments with hospitals/doctors for chronic/ terminal issues like cancer, surgery etc.
4. To connect medical equipment producers/sellers to hospitals trying to expand and help them arrange flexible payment plans.
5. To connect local hospitals to foreign/diaspora doctors to facilitate performance of complex medical procedures.
6. To provide a platform to doctors to schedule their appointments on their free time so their services could be utilized.

Tools:

- VS Code
- Android Studio

It depends on student's skills and technology he/she is interested to work in.

Supervisor:

Name: Taliah Tajammal
Email ID: taliah.tajammal@vu.edu.pk
Skype ID: taliah.tajammal@vu.edu.pk

LifeLine Tracker

Project Domain / Category

Mobile Application

Abstract / Introduction

It is an android based mobile application that will keep track of a patients' health. This mobile application will keep the personal profile and medical record of a patient. In this app, user will be able to add patient's personal profile, medical history, doctor appointments and vaccination records. It should provide an alert message to update the person about next appointment to the doctor and daily medicines. The patient can add his/her medical record like blood pressure, sugar level, pulse rate etc. and if these values are not in normal range, then it should alert a patient for emergency visit to the doctor. An alert message should also be generated if vaccination date is near or has passed or if appointment is due. Application must also provide the mechanism to keep track of a patient's medical record of illness and treatment (like what was illness like blood pressure, diabetes flu, fever, chest infection etc. and what was the medicine recommended by Dr. along with Dr. name and contact). There should be a facility to upload the image of prescriptions against illness records.

Functional Requirements

There are following functional requirements:

1. User will be able to add the personal profile of a patient.
2. User will add the record of medical history of a patient (like what was illness like blood pressure, diabetes flu, fever, chest infection etc. and what medicine was recommended by Dr. like Panadol, Rigix, Glucofage etc. along with Dr. name and contact).
3. User will be able to add vaccination record of patient.
4. It will give alert message in case of emergency visit to doctor if patient is not well.
5. It will give an alert message if vaccination date is near or has passed or if doctor appointment is due.
6. It will update patient about daily medicine.
7. There should be a facility to upload the images of prescriptions against illness record.

Tools and Languages:

IDE: Android Studio
Language: Java
Database: SQLite / Firebase

Supervisor:
Name: A Q Mohsin
Email ID: mohsin@vu.edu.pk
Skype ID: aqmohsin.vu

Real Estate iOS App

Project Domain / Category

Mobile Application

Abstract/Introduction

Investment is the allocation of resources, typically money or capital, with the expectation of generating a return or profit in the future. Investors seek to grow their wealth or achieve specific financial goals through various investment opportunities. Investment choices can vary widely, from stocks and bonds to businesses and real estate.

Real estate investment is a significant category within the broader realm of investment. It involves acquiring and owning real property, such as residential or commercial buildings, land, or real estate-related assets, with the aim of generating income, building wealth, or diversifying an investment portfolio. Real estate investments can provide rental income and capital appreciation, and they often serve as a tangible and long-term asset. The real estate market offers diverse opportunities for investors, from buying residential rental properties to participating in commercial real estate ventures, making it a crucial component of many investment strategies.

"Real Estate iOS App" is an application designed to provide users with facilitation to buy properties. The main idea of the “Real Estate iOS app” is to show you property Listings. This app could provide a list of properties with description, price, property type. The app could also include a Notes feature where users can record their favorite properties.

Main Roles of the System:

There will be five options in its side menu;

- Profile
- Best Properties
- My Favorite Property
- My Favorite Estate Agents
- Logout

Core Functionality:

The core functionality and basic flow of the app will be as follows:

1. First of all, the user will encounter the home screen which consists of a list of the Top 10 Best Properties.
2. Each property also has a like button, if the user like a property, that property will lead to user's favoritee properties.
3. The app will also allow a user to save his/her properties in Its Notes section.
4. There will also be a favorite Property Agents Screen which will show Estate Agents and also have a like button and in turn liked agents will be shown in the My Favorite Estate Agents Screen.
5. The user will have to register before writing property in Notes if he/she is not registered already.

The other Screens will work as:

- **Profile.**

  Profile Screen will show the user his/her details (His/her First name, Last name, Age, Gender, Email, Password, Phone Number, Address)

- **Best Properties.**

  This screen will show the list of best properties.

- **My Notes.**

  This Screen will show all the Notes which the user writes about his favorite Properties.

There will be a need for a backend web API that will handle all backend tasks such as managing all property, best property and user data etc.

Tools & Language:

- IDE: XCode at mac-book
- Programming Language: Swift5 and latest versions
- Backend Server-side scripting technology: PHP
- API Testing Application: Postman
- Code Editors: XCode, Sublime, PHP storm Visual Studio, etc.

Note: If you need any further assistance regarding tools, feel free to contact me.

Supervisor:

Name: Hafiz Muhammad Haroon
Email ID: m.haroon@vu.edu.pk
Skype ID: haroon.sheikh322

SpendNexxus

Project Domain / Category

Mobile Apps

Abstract / Introduction

The functional requirements presented herein pertain to the Android Expense Tracker, a collaborative project undertaken by a team of two students. This project aims to develop a comprehensive mobile application that empowers users to effectively manage their personal finances. The Android Expense Tracker will encompass various functionalities and features to facilitate expense recording, budget management, income tracking, and the handling of lending and borrowing transactions. The primary goal of this application is to provide a user-friendly and versatile platform for individuals to monitor and analyse their financial activities. With a clear focus on functionality, user experience, and robust data management, this project seeks to create a valuable tool that assists users in making informed financial decisions. The functional requirements outlined in this document serve as a roadmap for the design, development, and successful implementation of the Android Expense Tracker.

Functional Requirements:

User Authentication:

1. Users must be able to register and create an account.
2. Users should be able to log in securely with their credentials.
3. The application should support user profile management.

Expense Recording:

4. Users must be able to add new expenses, providing details like date, amount, category, and description.
5. Users should categorize expenses for better organization.
6. Support for multiple currencies should be provided.
7. Users should be able to attach receipts or images to expenses.

Expense Management:

8. Users should be able to edit and delete expense entries.
9. Users must have access to a list of all expenses, filterable by date, category, or amount.
10. A search feature should help users find specific expenses.
11. Expenses can be marked as recurring (e.g., monthly bills).

Budgeting:

12. Users should be able to set and manage budget limits for different expense categories.
13. Notifications must be sent when users approach or exceed budget limits.

Income Tracking:

14. Users can record sources of income.
15. Users have access to income statements and history.

Lending and Borrowing Money

Lending Money (Owing Others):

1. Users should be able to record lending money to someone, specifying the amount, the recipient's name, and the reason for the transaction.
2. Users should set a due date for the repayment.
3. Users can view a list of pending loans and their status (e.g., paid, pending, overdue).

4. The application should send notifications to remind users about upcoming repayments.
5. For loans to users of the application, the recipient's username should be searchable to ensure accuracy.
6. For loans to individuals not using the app, users should be able to enter their name manually.

Borrowing Money (Owed to Users):

7. Users should be able to record borrowing money from someone, specifying the amount, the lender's name (with search functionality for users of the app), and the reason.
8. Users should set a due date for repayment.
9. Users can view a list of outstanding debts and their status (e.g., paid, pending, overdue).
10. The application should send notifications to remind users of upcoming repayments.
11. For debts to individuals not using the app, users should be able to enter their name manually.

Database and Offline Entry

Firebase Database Integration:

12. Utilize the Firebase Realtime Database for storing lending and borrowing transactions, user data, and expense information.
13. Implement secure data synchronization with Firebase to ensure data consistency.

Offline Entry Support:

14. Allow users to add, view, and edit lending, borrowing, and expense data when offline.
15. Data changes made offline should be synchronized with the Firebase database once a connection is re-established.

With these additional requirements, users of the Android Expense Tracker app will be able to manage lending and borrowing transactions effectively, whether they are dealing with other users of the application or external individuals. The integration with Firebase ensures secure data storage and synchronization, and the app also provides offline support to ensure that users can manage their finances even without an internet connection.

Important Note

This project can only be taken by a group of 2 students, one for front end /designing and 2nd one for back end.

If a student joins this project individually then it will his/her responsibility to complete both parts of the project. Grouping shall be made with both of the students consent and clearly mentioning the role of a student in the project/team.

Tools:

- Android IDE
- Java,Kotlin,XML

Supervisor:

Name: Bilal Bin Umar
Email ID: bilal.umar@vu.edu.pk
Skype ID: u.bilal

The Zakat Automation System Mobile App

Project Domain / Category

Mobile Application

Abstract / Introduction

The Zakat Automation System Mobile App is focusing on developing a mobile application that streamlines the process of Zakat calculation, collection, and distribution. Zakat is a fundamental aspect of Islamic financial and social responsibility, and this app aims to simplify and enhance the efficiency of managing Zakat-related activities for both individual users and Zakat organizations.

Functional Requirements:

1. **User Registration and Authentication:**
   - Users should be able to create accounts or log in securely to access the application.
   - Utilize secure authentication methods, such as email verification or two-factor authentication.
2. **Profile Management:**
   - Allow users to create and manage their profiles, including personal information, family details, and financial data.
3. **Zakat Calculation:**
   - Implement a robust algorithm for accurately calculating Zakat based on the user's financial information and assets.
   - Provide a user-friendly interface for inputting and reviewing financial details.
4. **Payment Integration:**
   - Integrate payment gateways to allow users to make Zakat payments directly through the app.
   - Ensure secure and easy-to-use payment processing.
5. **Zakat Records:**
   - Maintain a history of Zakat payments and receipts for users.
   - Generate reports or summaries of past Zakat transactions.
6. **Donation Tracking:**
   - Enable users to track their charitable donations and view progress towards meeting their annual Zakat obligations.
7. **Zakat Distribution:**
   - Allow users to select from a list of registered Zakat organizations or causes for the distribution of their contributions.
   - Implement a secure and transparent system for disbursing funds to beneficiaries.
8. **Notification System:**
   - Send timely reminders to users for upcoming Zakat payments, important dates, and other relevant information.
   - Notify users about the impact of their contributions.
9. **Educational Resources:**
   - Provide informational content on Zakat, its importance, and how it works.
   - Include FAQs and resources for users to learn more about the Zakat process.

10. **User Support and Feedback:**
    - Include a feature for users to contact support, report issues, or provide feedback on the app's usability and functionality.

Optional features may include language localization, offline functionality, and social sharing capabilities to promote the app and its mission. Additionally, consider collaborating with Zakat organizations to ensure the app aligns with their requirements and can be adopted for real-world use.

Tools:

List of tools and technologies that can be employed for different aspects of the project:

Front-End Development:

1. **Programming Languages:**
    - **Swift:** for iOS app development.
    - **Java/Kotlin:** for Android app development.
2. **Integrated Development Environments (IDEs):**
    - **Xcode:** for iOS app development.
    - **Android Studio:** for Android app development.
3. **UI/UX Design Tools:**
    - **Adobe XD, Sketch, Figma:** for designing the user interface.
    - **Zeplin or InVision:** for collaboration and handoff between designers and developers.
4. **User Interface Frameworks:**
    - **UIKit (iOS):** Apple's user interface framework for iOS.
    - **Android UI Framework:** Standard Android UI components for Android.

Back-End Development:

5. **Programming Languages:**

- **Node.js, Python, Ruby, Java, or C#:** for server-side development.

6. **Web Frameworks:**
    - **Express.js (Node.js), Django (Python), Ruby on Rails, Spring (Java), ASP.NET (C#):** for building the back-end server.
7. **Database Management:**
    - **MySQL, PostgreSQL, MongoDB, or Firebase Realtime Database:** for storing user data, financial records, and transactions.
8. **API Integration:**
    - Utilize RESTful or GraphQL APIs for payment gateways, email services, and other external functionalities.

Authentication and Security:

9. **Authentication Services:**
    - **Firebase Authentication, Auth0, or OAuth2:** for user authentication.

Payment Integration:

10. **Payment Gateways:** - **Stripe, PayPal, or other relevant payment gateways:** for processing Zakat payments securely.

Supervisor:

Name: Saeed Nasir
Email ID: saeednasir@vu.edu.pk
Skype ID: saeed-nasir

Virtual Art Studio

Project Domain / Category

Mobile Apps

Abstract / Introduction

"He created the heavens without any such columns that are visible to you, and placed (mountains as) anchors into the earth so that it may not tremble along with you, and spread out all kinds of animals in it. And We sent down water from the sky, so caused all kinds of elegant pairs (of plants) to sprout on the earth." (The Holy Quran: Para 21, Surah 31 Luqman, Verse 10)

This and several other verses highlight the diversity and beauty of nature, encouraging believers to reflect on the signs of God's creation and express gratitude for the blessings of the natural world. Nature, in art, is frequently shown as landscapes, seascapes, plants and animals that capture the spirit of its beauty, diversity and peace. Therefore, we are coming up with a noble idea of an art studio application.

Virtual Art Studio is an innovative Android application designed to provide artists with a dynamic and immersive platform for digital art creation, collaboration and community engagement. The app leverages cutting-edge technologies to simulate the experience of a traditional art studio while offering unique features tailored for the digital realm.

Functional Requirements:

I. **Users:** The app must support three types of users: Admin, Artists and Visitors.
   1. Admin: The admin will be responsible for a smooth operation of the platform by managing user accounts, organizing exhibitions and generating reports etc.
   2. Artists: Artists create their artworks using drawing tools (*i.e., paint, canvas, and sketching materials etc.*) and showcase their works in exhibitions.
   3. Visitors: Visitors can take part in exhibitions, view the artwork, provide comments and purchase featured artworks.

II. **Authentication:** App should provide registration page for artists and visitors, and login page for admin, artists and visitors; store credentials at Firebase Authentication.

III. **Databases:** Firebase cloud services (*i.e., Real-Time Database and Cloud Storage*) should be used as an online server for storing the data. However, for app internal storage, SQLite or Room database should be implemented.

IV. **Digital Canvas and Tools:** Digital canvas should be provided to artists with a wide range of tools including brushes, pencils, colour palette, eraser, selection & transform tools etc. for creating digital artworks.

V. **Artist Dashboard:** Artists should have a profile management section, where they can upload, edit, and remove artworks and have access to sales analytics.

VI. **Search and Discovery:** Visitors should be able to search for artworks based on different criteria like artist, style, medium and price range etc.

VII. **Virtual Exhibitions:** Admin should plan exhibitions, provide guidelines for artwork submissions and promote the exhibition on social media to attract a diverse audience.

VIII. **Artwork Sales and Transactions:** The platform should make it easier for visitors to purchase digital artworks by using e-wallet. Secure transaction process should be implemented.

IX. **Feedback and Critique Mechanism:** Visitors should be able to provide constructive feedback, ratings and comments for artworks in a supportive environment.

X. **Notifications and Alerts:** App should implement a proper notification system to alert users about new artworks, upcoming events and important updates. Use Firebase Cloud Messaging or Firebase In-App Messaging or both in this regard.

Tools:

1. **IDE:** Android Studio
2. **Programming Language:** Java/Kotlin
3. **Databases:** Firebase Real-Time/Cloud Fire-Store & SQLite/Room

Supervisor:

Name: Muhammad Imran Afzal
Email ID: imran.afzal@vu.edu.pk
Skype ID: imranafzal126

Voice and text translator app

Project Domain / Category

Mobile App

Abstract / Introduction

Voice translators are very much in demand nowadays because there are number of languages are spoken by the peoples around the world and no one can learn all those languages. So there is a need for a translator to understand any unknown language. The voice translator can be helpful for the person who travels a lot around the world, and this can be helpful in understanding the local language which is not native to him. Different translators are being used for translating the languages but still there is room for better translator. This mobile app should help in translating multiple languages in the desired language. This app should also consider different language variants as well. For example, if we consider converting Punjabi to English then this app should consider all Punjabi variants.

Functional Requirements:

The bulleted list of functional requirements are;

1. User should be able to register in the mobile app by entering username, email, password, contact no and address.
2. User can login the mobile app by giving username and password.
3. After login the user can see the default speaking interface where user speak any language and convert to English.
4. User can select multiple language to convert like English or any other language.
5. The app can convert different variants of a particular language like Punjabi.
6. The app should be particularly tested for Punjabi variant.
7. It should also convert English to Punjabi or any other selected language.
8. The app should also provide text interface as well.
9. User should enter text and this text can be converted to desired language.
10. App should identify the language of the entered text then convert it to the selected language.
11. App should work on different platforms. So use flatter and Firebase for development.

Tools:

Flutter, Firebase

Supervisor:

Name: Muhammad Anwar
Email ID: manwar@vu.edu.pk
Skype ID: lovelyanwar

VVPA - Virtual Video Player Application

Project Domain / Category

Mobile Application

Abstract / Introduction

The VVPA app is a multimedia solution designed to redefine the video playback experience for users of Android devices. In an era where video content has become a central aspect of our digital lives, VVPA addresses the need for a comprehensive, user-friendly, and versatile platform. This application's core functionality includes an appealing splash screen, an informative initial tour, a robust media library, advanced video playback capabilities, support for various video formats, seamless video streaming, and accessibility features such as subtitles and closed captions. It ensures effortless media management for the users of android.

Functional Requirements:

Functional Requirements of the application are given below:

1. **Splash Screen:**
   Your application must have a splash screen which is lunched automatically each time before the start of the Application.
2. **Application Tour:**
   When your application will launch at the first time after installation. You must perform a quick tour of the VVPA to guide the user about it.
3. **Media Library:**
   Your media library must scan, and index videos stored on the device. Also, allow users to add and remove videos from playlists or mark them as favorites.
4. **Video Playback Engine:**
   Implement the video playback engine, which should support various video formats (e.g., MP4, AVI, MKV) using Android's MediaPlayer or ExoPlayer.
5. **Video Playback Controls:**
   Develop features like play, pause, seek, volume control, and playback speed adjustment.
6. **Video Streaming:**
   The VVPA must be able to support or handle video streaming from URLs and local storage.
7. **Accessibility Features:**
   The video player should support video subtitles and closed captioning.

Tools:

Languages: Kotlin / Dart
Design: Material 3 / JetPack Compose
Database: SQLite / Firebase
Development Environment: Android Studio
Framework: Flutter (If use Dart language)

Supervisor:

Name: Muhammad Bilal
Email ID: bilal.saleem@vu.edu.pk
Skype ID: bilalsaleem101

Portfolio Website Using Flask

Project Domain / Category

Web Programming/Website

Abstract/Introduction

A digital portfolio can showcase one's most impressive accomplishments and boost their presence on the web, allowing them to pursue possibilities for potential employment and collaborations. Having a portfolio website can be a great way to make yourself stand out from the crowd who are still relying on their resumes. This could be a total game-changer for your professional and social existence. The aim of this project is to develop a website that comprise of front-end having an attractive profile image, labels/ links to pages like Home, Skills, Projects, Publications, Experiences, Supervision, Education, Resume, Register, and login (for admin only) Pages. The admin side provide functionality like adding new pages, edit, update, profile picture, skills, projects, publications, experiences, among others.

Functional Requirements

The website should provide:

1. A user-friendly interface (UI) that allows visitors to view all the necessary information like skills, projects, publications, experiences, among others.
2. Allow admin to register, login to the admin panel.
3. The admin panel shall provide interface that allow the admin to:
    a. View their profile and edit them
    b. Add new pages
    c. Delete existing pages
    d. Edit and update the contents pages like Skills, experiences among others.

Tools / Application Platform**: HTML, CSS, Flask Framework, and Python**
Database: **Excel Sheet/MySQL**

Supervisor:

Name: Dr. Said Nabi
Email ID: said.nabi@vu.edu.pk
Skype ID: saidnabi115

Prediction of TV Show Popularity based on Sentiment Analysis

Project Domain / Category

Information Retrieval

Abstract / Introduction

TV show popularity prediction using Sentiment analysis is one of the most interesting and challenging tasks. Episode of a particular TV show released on weekends or holidays may attract more audience than those on weekdays. Furthermore, since different episodes are usually released on different days, the popularity prediction for TV shows is one of the interesting tasks.

Easy prediction of TV show which is trending based on individual ratings can be done. Good, bad and neutral comments can be predicted based on reviews or comments. Due to this the visitor will get to know the show popularity. Reality TV is the new mantra of television producers and channel executives.

The main purpose of this project is to find the ratings based on the user's comments. Nowadays, most of the television shows are reality shows based on singing, acting, morning shows and Ramadan transmissions. There are many shows telecasting in different channels. There are many ways to find out the view count. We can find out which show has the highest rating and considered as the most viewed show. Application developer will use a database of sentiment based keywords along with positivity or negativity weight in database and then based on these sentiment keywords mined in user comment is ranked and predict the popularity.

Functional Requirements:

1. **Admin Panel:**
    a. **Login:** Admin need to login into the system by inputting the login credentials.
    b. **Add Pages:** Admin will add page details such as page name and page link (details of TV shows).
    c. **Graphical Representation:** Admin can generate 5 graph (Pie Chart & Bar Chart) based on Age, Gender, Location, Comment's Sentiment based on peoples review on each TV Show. This will help the users to know about the popular/trending TV shows.

2. **User Panel:**

- User login's to the system/application by using his/her user ID and password.
- User can edit his/her profile details along with display picture.
- User will post comments on the uploaded TV shows posted by the admin.
- User can also view comment of other users posted on different/uploaded TV shows.
- Users should be able to comment on stored TV shows only once. The system stores each comments of the users for further processing and find out the sentiments and their weightage and store it in database.

- ❖ The stored comments of the users will be analyzed by the system with the help of sentiwordnet dictionary and will rate/rank the show accordingly.
- ❖ User can easily decide whether the uploaded TV shows by the admin/ system are good, bad or worst based on sentiment classification.

Tools:

- ❖ SQL 2008
- ❖ Visual Studio 2010
- ❖ Senti Word Net Dictionary
- ❖ Wamp Server

Note:

1. SentiWordNet Dictionary will be used for sentiment classification tasks only.
2. You may use any other platform for coding in which you have command, but make sure all the mentioned FR's should be completely implemented.

Supervisor:

Name: Tayyaba Sehar
Email ID: Tayyaba.sehar@vu.edu.pk
Skype ID: Tayyaba.sehar13@outlook.com

EditMasters: Your Online PDF and Photo Editing Suite

Project Domain:
Web Programming

Abstract:
In the age of digital communication and content creation, the demand for accessible and user-friendly tools to edit and manipulate PDF documents and photos has never been greater. Recognizing this need, we present "EditMasters," an innovative online platform designed to empower users with the ability to effortlessly edit, enhance, and transform their PDFs and photos with just a few clicks. Multifunctional and intuitive editing tools are in demand across various domains, from professionals trying to edit documents for business or academic purposes to creative individuals making compelling visuals. EditMasters bridges this gap by providing a comprehensive and user-friendly solution for editing PDFs and images, all within a secure and reliable online environment.

Functional Requirements:

1. User Registration and Authentication:
    - Users can register using email or social media accounts.
    - Users must be able to log in securely.
    - Implement a password recovery mechanism.
2. PDF Editing Tools:
    - Users can upload PDF documents for editing.
    - Tools should include features like text editing, annotation, merging, splitting, and page rotation.
    - Allow users to save and download edited PDFs.
3. Photo Editing Tools:
    - Users can upload images for editing.
    - Tools should include features like cropping, resizing, adding text or images, filters, background removing and basic retouching.
    - Allow users to save and download edited photos.
4. File Format Conversion:
    - Users should be able to convert PDFs to image formats (e.g., JPG, PNG) and vice versa.
    - Support common file formats for conversions.
5. Cloud Storage Integration:
    - Users can save their edited PDFs and photos to cloud storage services like Google Drive or Dropbox.
6. Collaboration:
    - Allow users to collaborate on PDF and photo editing projects, including sharing and real-time collaboration features.
7. User Profile and Dashboard:
    - Users can view and manage their uploaded documents, edited files, and project history.
    - Provide options for personalizing profiles.
8. Push Notifications:
    - Send push notifications to users regarding updates, and promotional offers.

Tools:

1. Front-end Development:
    - HTML, CSS, JavaScript
    - Frameworks: React, Angular, or Vue.js
2. Back-end Development:
    - Programming Languages: Python, Ruby, or Node.js
    - Frameworks: Django, Ruby on Rails, or Express.js
3. PDF Editing Libraries:
    - PDF.js, PDFtk, or PDFTron for PDF manipulation.
4. Photo Editing Libraries:
    - Fabric.js, CamanJS, or PixiJS for photo editing capabilities.
5. Cloud Storage Integration:
    - Google Drive API, Dropbox API, or Amazon S3 for cloud storage integration.
6. Authentication and Security:
    - OAuth2 for third-party authentication.
    - Use HTTPS for secure communication.
    - Implement security libraries, such as bcrypt for password hashing.
7. Unified Modeling Language (UML):
    - Microsoft Visio
    - IBM Rational Rose
    - Visual Paradigm

Supervisor:

Name: Usama Ahmed
Email ID: usama.ahmed@vu.edu.pk
Skype ID: live: vu_usama

Fitness Club Management System

Project Domain / Category

Web based application

Abstract / Introduction

Fitness is very important for every person for healthy life, there is a lot of Fitness Clubs but most of the time the information can't handle properly due to which these clubs did not produce this type of change in some one life which was needed. So our Fitness Club Management System is designed to handle this information carefully and on the basis of given requirement Workout Plan was suggested.

Before every workout the manager of the Club take measurement of the customer like Height, Weight, Waist, etc. Then the manager take a detail interview of the customer about his daily food intake, activities and his Goal e.g. Reduce Belly Fat.

On the basis of the given detail, the manager calculate customer's *Body mass index* (*BMI*), make a diet Plan and Workout Plan.

There is different categories of Workouts in the Club for different type of Customers with different Instructors.

There is also a complete detail about Instructors like his personal Information, his Qualification and his timings.

The Manager or Manager Assistant also manage an account department about Customers fee and Staff Salaries, Bills & Rent etc.

Our software will be easy to use for both beginners and advanced users. It features a familiar and well thought out, an attractive user interface, combined with strong searching insertion and reporting capabilities. After completing this project the Manager can check all detail in the form of **Reports** about the Customer Fitness level and his Improvement, on the basis of which the manager can change his diet plan, Workout plan etc. The manager can also calculate the profit by deducting monthly Bills, Salaries, and Rent from the total student fee.

Functional Requirements:

1. **Manager**
    - Manager can login and logout.
    - Manager take a backup of the Database.
2. **Customer Registration**
    - In this module Manager can add and delete Customer.
    - In this module Manager assign Workout to Customer.
    - And assign IDs.
3. **Instructor/ Manager Assistant Registration**
    - In this module Manager can add, delete and Update Instructor/ Manager Assistant.
    - And assign IDs.
4. **Accounts**
    - In this module Manager/ Assistant Manager manage activities related to Customer fee, staff salary, Rent, due fee.

5. **Workout**
    - In this module Manager add Workouts and manage different Categories of Workouts.
    - In this module Manager select workout plan for different Customers.
6. **Reports**
    - In this module Manager can manage
    - Fee Report, Due Fee, Salary, Expenses, and Profit.
    - There can be daily reports
    - Weekly reports
    - Yearly reports

The system should be able to **generate** a report of profit on daily, monthly and yearly basis.

Note:

Templates (Flask template or any other template and Drag and Drops) are not allowed to use in this application you need to use python libraries.

For this project you need to visit any Fitness Club and get more functional and non-functional requirements from the Manager and if you have any ambiguity contact at my Skype id mentioned at the end.

Tools:

Python is mandatory.

Supervisor:

Name: Asadullah
Email ID: asad.ullah@vu.edu.pk
Skype ID: asad.ullah121

FleetFuel - The Online Fuel Delivery Web Application

Domain/Category

Web Programming

Abstract / Introduction

FleetFuel is a user-friendly web application developed to simplify the fuel delivery process for companies with vehicle fleets, such as taxi services and bus operators. No longer do you need to coordinate multiple vehicles to visit a fuel station; instead, the fuel comes to you. Users, who are vehicle managers or drivers, can access the web application to place fuel orders. They provide essential details, including the type of fuel (petrol or diesel), the required quantity, and the desired delivery location.

Unlike traditional online payment methods, FleetFuel utilizes a "Cash on Delivery" system, where users make the payment to the delivery personnel when the fuel arrives. Gas stations also have their space in the web application. They can log in, manage their inventory, and keep track of incoming orders, ensuring they have sufficient fuel to meet the demand. Admins play a pivotal role in overseeing the system. They can manage gas stations, set fuel prices, and monitor the flow of orders.

Functional Requirements:

User Management:

- User registration and authentication.
- User profile management.

Order Placement:

- Fuel ordering with type, quantity, and delivery location.
- Real-time pricing information.

Order Tracking and Management:

- Order status tracking.

Location Services:

- Geolocation for accurate delivery.

Admin Management:

- Gas station management, addition, and removal.
- Fuel type assignment and price setting.
- Order monitoring and management.

Gas Station Management:

- Gas station access and login.
- Inventory management and order processing.
- Order cancellation as needed.

Order History and Reporting:

- View order history.
- Generate reports for analysis.

Notifications:

- Notification system for order updates.

Customer Support:

- Feature for user inquiries and issue reporting.

Tools:

- Server-side programming language: PHP
- Framework of PHP : Laravel, CodeIgniter or any other framework of PHP
- Scripting and styling languages: HTML and CSS
- Customer-side scripting: JavaScript and JQuery
- Database: MYSQL IDE: PHP Storm or NetBeans or any one of your choice
- Local host Server: WAMP or XAMPP

Supervisor:

Name: Hafiz Muhammad Azeem Sarwar
Email ID: azeem.sarwar@vu.edu.pk
Skype ID: h.m.azeem2

foodies.com

Project Domain / Category

Web Application

Abstract / Introduction

Suppose we have a project named “foodies.com”. In this project, we have a website that serves as a bridge between **Food Lovers and Restaurants**. A food lover can become a registered user to get the access to the authentic delicious food of restaurants available in his/her area.

Functional Requirements:

1. Restaurant Owner login and signup.
2. User (Food lover) login and signup.
3. Admin login.
4. Restaurants list should be displayed to the user.
5. User should be able to search a particular restaurant.
6. User should be able to see the detailed menu and location of a particular restaurant.
7. User should be able to order the food from a particular restaurant.
8. User should be able to have a real time chat with restaurant representative.
9. User should be able to rate a particular restaurant.
10. Restaurant owner should be able to post a new offer and the users of that particular area should be notified regarding the offer.
11. Admin should be able to manage (create, update and delete) the orders and all users (Food lovers and restaurant owners).
12. All statistics regarding foodies.com should be displayed on the Admin Dashboard.

Tools and Technologies:

PhpStorm/Visual Studio code, Xampp, Laravel/Codeignitore (Framework), PHP, JavaScript

Supervisor:

Name: Hafiz Bilal Saqib
Email ID: bilal.saqib@vu.edu.pk
Skype ID: bilal.saqib52

Happy Meal

Project Domain / Category

Web Programming

Abstract / Introduction

The “Happy Meal” is a website for a restaurant that offers a delivery service too. The customers would be able to see all the menu items on the screen. The website will allow the customers to place orders online, and facilitate delivery requests. The primary goal is to enhance the restaurant's online presence and improve customer convenience. The website will feature a user-friendly interface with an attractive design to engage customers.

Customers can create accounts to store their contact information, delivery addresses, and order history for a faster checkout experience. Customers can browse the menu, add items to their cart, can customize their ordered items, and place orders with delivery or dine-in.
The design should be responsive compatible with both desktop and mobile devices. Real-time order tracking, reviews, and ratings provide a comprehensive user experience.

Functional Requirements:

Customer Panel:

Registration and Login: Users can create accounts, log in, and access their profiles.

Browse Menu: Users can view the restaurant's menu, including categories and item details.

Order Placement: Select items, add to cart, specify quantity and customizations, and place orders.

Online Payment: Secure payment processing with options for credit/debit cards and digital wallets.

Order History: Customers can view their order history and reorder previous orders.

Delivery Address: Ability to save multiple delivery addresses.

Delivery Tracking: Real-time tracking of delivery status and estimated arrival time.

Review and Ratings: Users can leave reviews and ratings for both the restaurant and individual dishes.

Admin Panel:

Dashboard: Admin dashboard for managing orders, menu items, and user accounts.

Menu Management: Add, edit, or remove items from the menu, including prices and descriptions.

Order Processing: Accept, prepare, and mark orders as delivered.

User Management: Manage customer accounts, including editing and deactivating accounts if necessary.

Delivery Tracking: Monitor delivery orders and their statuses.

Feedback Management: Review and moderate customer reviews and ratings.

Tools:
Front-end: HTML, CSS, Java Script, Bootstrap (responsive website)
Backend: Laravel
Server: Xampp

Supervisor:
Name: Maham Murtaza Khan
Email ID: maham.murtaza@vu.edu.pk
Skype ID: maham.khan024

NAT BAGS

Project Domain / Category

Web Programming

Introduction

The online mode of a business allows customers to order goods and services online without visiting business centers at convenient times. In view of this, the proposed project aims to develop a website for Bags of NAT brand that allows registered users (customers) to purchase different types of bags. The website will display available product categories, along with product images, brand/company name, price, number of items in stock, and user reviews of the product (if any) and related description, etc. in appropriate design and layout. Users will be able to purchase/order available items after registering on the website and using the payment method (cash on delivery). The website will provide an interactive interface and rich search functionality to find different types of tableware items through different filters. The website will allow registered users to register their comments/reviews on any purchased item. Comments/reviews will be posted on the website along with article information. Additionally, registered users will be able to submit their complaints/feedback regarding the website's services. Ordering tableware online through the proposed website will eliminate the actual cost of visiting markets for this purpose.

Functional Requirements:

Following are key functional requirements of the proposed system:

1. User Registration/Sign Up, Sign In

For user registration and Sign In of following three types of the users of the website, Registration and Login pages would be build:

- Visitor (Unregistered User)
- Registered user (Customer)
- Registered user (Administrator)

Roles of the users will be as follow:

- Visitor will view the items on website to search his/her required bags.
- Visitor will login to purchase his/her selected item.
- Customer will see the description and other features of bag before adding bag in cart.
- After finalizing customer will add bag in cart and place order.
- Required information for order placement would be filled by customer.
- Customer will select payment method as cash on delivery then submit order.
- Admin will send an email to customer mail id for confirmation of order.
- After customers approval order will be confirmed.

Specifications:

1. **Email Notification and Verification**
   - Visitor will register him/her on the website.
   - On submitting the registration information, an email notification will be sent with a confirmation link to the visitor's given email ID.
   - On confirmation through link, the Admin will approve the registration requests from users.
   - An email notification will also be sent to the registered user on approval or rejection of any request.
   -

2. **Admin Panel**
   - There will be proper Admin Panel / Dashboard to add/ delete and update all information such as description, price, stock, images of bags handled by Admin.
   - Admin will perform category management as well as user management (accepting /rejecting the user registration requests).

3. **Display of Information on the website**

The item name, quality, material (leather, faux, cloth etc.), category (Hand bags, Shoulder bags, Cross bags.. etc.) brand/company name, thumbnail image, price and number of items available in stock, related description, new Arrival, Sale (if any), comments/reviews by the registered users etc. should be displayed on the website in proper design. On clicking the thumbnail, the website will maximize the image.

4. **Placing Order on the Website**
   - The website will allow the registered user(s) to make order against their selected items.
   - There will be proper interfaces on the website in this regard.
   - The user will first have to select the item to put into the shopping cart, and then will have to pass through the payment method i.e. cash on delivery.
   - Upon successful transaction, a confirmation mail will be sent to the user's provided mail.

5. **Searching**

Filter and sort features must be provided having given options and filter or sort the data accordingly.

- Name
- Brand / Company Name
- Category Wise
- Material
- Price Wise
- New Arrival
- Sale
- Best Sellers

Admin will also be able to search the information by user IDs.

6. **Comments / Reviews**

Users can submit their comment and review on the web page; for that specific items which are purchased by users.

7. **Complaints / Feedback**

A complaint/feedback interface should be given to registered user to submit their complaints and feed backs on website. Admin would manage this information.

Helping Material Links:

Python Tutorial For Beginners
https://www.youtube.com/watch?v=qYyg3BKijRc&list=PLYwpaL_SFmcCJu4i6UGMkMx1p3yYZJsbC

Django Tutorials for Beginners
https://www.youtube.com/watch?v=C1NgOmoOszc&list=PLjVLYmrlmjGcyt3m6rt21nfjhYSWP_Ue_

E-commerce FullStack Website using Django
https://www.youtube.com/playlist?list=PL_KegS2ON4s53FNSqgXFdictTzUbGjoO-

Tools:

1. Python and Django

Supervisor:
Name: Neelam Alam
Email ID: neelam.alam@vu.edu.pk
Skype ID: neelam-cs

Online Disaster Information Management System

Project Domain / Category

Web programming

Abstract / Introduction

Whenever a natural calamity or disaster hits a country, the whole nation suffers. At the time of any disaster, it becomes of paramount importance that the damage should be minimized, and rehabilitation should be provided at a fast pace to avoid any further damage. Therefore, Online Disaster Information Management System is proposed with the idea to engage rehabilitations institutes (Law enforcement agencies and NGOs etc.) and general public to mitigate the impacts of any disaster. Using this system, both the rehabilitation institutes and the general users register an account on the website. Rehabilitation institutes can provide information of relief granted. Both the rehabilitation institutes and general users can add and view the disaster related information.

There will be three types of users of this application.

- National Disaster Management Authority (NDMA) as Administrator
- Rehabilitation Institutes
- General User

Functional Requirements:

Here is a list of functional requirements:

1. NDMA can manage the users of the website.
2. NDMA can manage relief information.
3. NDMA can manage disaster information.
4. Rehabilitation Institutes can register on the website.
5. Rehabilitation Institutes can provide the information of relief granted.
6. Rehabilitation Institutes can add the disaster information.
7. Rehabilitation Institutes can post a public message.
8. General User can register on the website.
9. General User can check the relief information.
10. General User can check the disaster information.

Note:

- These are basic requirements of the application. Students may add further functionalities to make the application more useful.
- Virtual University of Pakistan (VU) will not provide any kind of hardware for this project; student has to arrange the required hardware by himself/herself.
- VU will not pay for any license of the software, the libraries /toolkits/APIs used in this project.

Tools:

Microsoft Visual Studio, SQL Server, Asp.net;

Note: You are advised not to switch the tools. If you do so, you will handle the technical side yourself.

Supervisor:

Name: Ghulam Abbas
Email ID: ghulam.abbas@vu.edu.pk
Skype ID: live:49cf19b1f61ba126

Online DRC

Project Domain / Category

Web Programming

Abstract / Introduction

This is a web-based application which acts as online dispute resolution council (DRC) between two parties. A party can file a case against any other party through "DRC Portal", the DRC secretary gives a date for hearing the case and assign the DRC members to the case. The comments of both the parties are taken by the DRC members along with the comments of the members. They can give a new date for further hearing or can conclude the case.

Functional Requirements:

Following are the functional requirements for the project:

1. User registration module on front end.
2. User management section on admin side.
3. Members management feature on admin side.
4. User can file a dispute against someone through DRC portal.
5. Management of disputes on admin side, assign dates and DRC members to case.
6. Dispute resolution feature (Case Hearing(s), Comments, Decisions etc.).
7. Success Cases.
8. Reports.

Tools:

You are free to use any tool provided that all the functional requirements are met properly.

Supervisor:

Name: Mehboob Ali
Email ID: Mehboob.ali@vu.edu.pk
Skype ID: mehboobalivu@outlook.com

"ONLINE LOGISTICS SYSTEM"

Project Domain / Category

Web Application

Abstract / Introduction

Logistics is an important part in supply chain management. It plays a vital role in supplying good from supplier to the manufacturer and then to the seller. If logistics fail or does not work the entire business comes to halt.

With the digital transformation logistic companies are going online to provide real time booking, tracking and visibility to both businesses and logistic companies. This allows businesses to track shipment and make decision making as per the shipment. Moreover by adopting digital model, logistic companies can gain the advantages of improved efficiency, route tracking, shipment management, online booking, record keeping and online payment etc.

Functional Requirements:

1. Users will be able to create an account by signing up a form.
2. The sign-up form will request essential information such as name, address, phone number, and email address for future reference.
3. Users will be able to check fright details and book logistics.
4. Users will be able to make online payments for a selected trip.
5. Users will be able to track route for their shipments
6. Administrator will be able to enter details about vehicles registered with the company.
7. Administrator will be able to enter details about drivers registered with the company.
8. Administrator will be able to add details of the trips a driver has made.
9. The trips details will contain details such as vehicle details, starting point, destination, distance covered, charges per trip etc.
10. Administrator will be able to enter different expenses of the company.
11. The expenses will include fuel expenses, maintenance, driver's salary etc.
12. Administrator will be able to add all income details.
13. Administrator will be able to produce reports by mentioning a period for which total income and deductions will be calculated
14. The reports will be calculated based on a schedule i.e. at the end of each month or on demand.
15. Administrator will be able to produce a print of the report generated.

Tools:

PHP, MySQL, Xammp, Notepad++.

Supervisor:

Name: Jibran Khan
Email ID: jibrankhan@vu.edu.pk
Skype ID: jibrankhanvu

Online Nursery Farm

Project Domain / Category

Web application

Abstract / Introduction

The Online Nursery Farm project aims to develop an e-commerce platform that allows customers to browse, purchase, and have plants, trees, and garden supplies delivered to their doorstep. This platform will offer a wide variety of plants, gardening tools, and resources to cater to gardening enthusiasts and those looking to enhance their living spaces with greenery.

Functional Requirements:

User Panel

- **User Registration:** Users should be able to create accounts with basic information and personal details.
- **User Login:** Registered users should be able to log in securely to access their accounts.
- Product Catalog
- **Product Listings:** Display a catalog of plants, trees, gardening supplies, and related items.
- **Product Search:** Allow users to search for products by name, category, price, or other filters.
- **Product Details**: Provide detailed information, including images, descriptions, and pricing for each product.
- **Product Reviews:** Enable users to leave reviews and ratings for products they've purchased.
- **Add to Cart:** Users should be able to add products to their shopping cart.
- **Shopping Cart Management:** Allow users to review, modify, or remove items in their cart.
- **Checkout Process:** Guided checkout process with shipping and payment information.
- **Payment Integration:** Secure payment processing through various payment gateways.
- **Order Confirmation:** Send order confirmation emails to customers.
- **User Profiles:** Users should have profiles where they can view order history, track orders, and manage personal information.
- **Order Tracking**: Real-time order status updates and shipment tracking.

Admin Panel

Admin Dashboard: Administrative interface to manage products, users, orders, and reviews.
Inventory Management: Manage product listings, stock levels, and pricing.
User Management: Admins can add, modify, or delete user accounts.
Order Management: Track orders, process refunds, and handle customer inquiries.
Content Management: Update and manage website content, including FAQs, blogs, and gardening tips.

Additional Features

Plant Care Guides: Provide plant care tips, guides, and articles for customers.
Live Chat Support: Implement a live chat feature for customer support.

Tools:
HTML,CSS,Bootstrap, JavaScript,jQuery, PHP, MySQL

Supervisor:
Name: Sohail Aamir
Email ID: sohailaamer@vu.edu.pk
Skype ID: sohailaamir22

Recipe Book

Project Domain / Category

Web Application

Abstract / Introduction

We are living in a fast paced world, where the need for a comprehensive and user-friendly platform for discovering, sharing, and organizing recipes has become increasingly essential. Our Recipe Book Website is designed to cater to this demand, offering an extensive collection of recipes from various cuisines and dietary preferences.

Functional Requirements:

We will have two panels in this website: Admin & User

1. Registration:
   User will register first, so that they log in to the system.
2. Login:
   Admin and user will login to the system (after registration) using id and password.
3. Manage users:
   Admin will manage all the users.
4. Manage Recipes:
   User will add recipe including their ingredients, step by step method, image of that particular recipe also they can manage their recipe afterwards by updating or deleting them.
5. Categorize Recipes:
   User will categorize all there added recipes whether they are desi, continental, gluten-free, dietary recipes etc. (You can add more categories as well)
6. Approve/ Disapprove Recipe:
   Admin will approve or disapprove recipe based on whether the user posted some authentic content or to check restrict user to not post any gibberish text as a recipe.
7. View Recipes:
   Admin and user both can view all the recipes.
8. Search Recipes:
   User & Admin both can search any recipe based on their names or category.
9. Social Media:
   User can post any recipe directly from the website to any social media platform.

Tools:

C#, .net, Visual Studio, SQL, Tomcat

Supervisor:

Name: Manahil Hassan
Email ID: manahil.hassan@vu.edu.pk
Skype ID: manahil.hassan2

RESIDENTIAL AUTOMATION SYSTEM

Project Domain / Category

Web based Application

Abstract / Introduction

Develop in automation system for residential Units like towers that have multiple flats in which tenants are leaving there on rental basis. All the operations performed in those residential towers need to be automated. The traditional operations performed by the manager of the tower are to register the tenant and assign a particular flat or room. Collect Rents from those tenants on monthly basis. Apart from that manager pay the utility bills from the income and also calculate the expenditure like salaries paid to the sweepers and watchman etc. All those activities need to be automated in the form of a web based application.

The monthly income should be distributed among owners and data should be stored in the data storage Unit of the web application. There should be two dashboard one for the internal users like manager owner and other dashboard should be used for the clients or tenants so that they would see their rent detail when they pay the rent.

Functional Requirements: Provide a bulleted list of functional requirements

1. Flat and room detail registration in the system
2. Register Tenants those customers who are interested to get flats or room on rent
3. Assign flats to the tenants which are vacant
4. Register employees working in that residential tower like sweeper watch man manager etc
5. Register owner detail of the residential tower
6. Collect monthly rent from the tenants
7. Daily expenditure forms
8. Calculation of income
9. Share income with the owners if there are multiple owners
10. Two dashboard one for tenants and other one for owners and managers

Tools: PhP language, My Sql Database, XAMP Server

Supervisor:

Name: Ijaz Ullah
Email ID: ijaz.ullah@vu.edu.pk
Skype ID: live:.cid.c857165865a4ed13

Sale Purchase of Automobiles and Spare Parts

Project Domain / Category

Web Programming.

Abstract / Introduction

The "Sale Purchase of Automobiles and Spare Parts" is a web-based platform that offers a comprehensive solution for users to buy and sell automobiles and spare parts in an online marketplace conveniently. This platform provides a seamless experience for buyers and sellers, facilitating listings, negotiations, transactions, and communication. Users can create detailed listings, featuring vehicle specifications or spare part details, multiple images, and price information. The system includes features such as a secure transaction process, in-app messaging, reviews, and a user-friendly administrative panel for content moderation.

Additionally, the platform employs geolocation services and supports online payment methods. This project will provide students with a comprehensive understanding of web development, e-commerce, and database management.

Functional Requirements:

1. The system should support User Registration/Authentication based on user roles (buyers, sellers, admin). It should allow users to manage their Profiles to update information.
2. Admin should have access to manage the users and should have the right to block sellers based on poor ratings.
3. Sellers should be able to create listings for vehicles and spare parts. The system should allow multiple image uploads and image management for each listing.
4. The system should support adding Vehicle details (make, model, year, mileage, VIN, etc.) and spare part details (part name, compatibility, condition, price).
5. The products should be Categorized and filtered for easy navigation including the search functionality with advanced filters (price range, location, condition, etc.).
6. The system should support adding Detailed product pages with descriptions, specifications, and seller contact information which needs to be accessed by the buyers. It should include negotiation options for the pricing where applicable. It should include Google Maps integration for showing the location of items and sellers.
7. The system should include Reviews and rating features for both products and sellers.
8. The system should implement an In-app messaging system for communication between buyers and sellers.
9. The system should also include transaction management with the following features:
    a. Cart system for adding items for purchase.
    b. Checkout process with some payment options.
    c. Order tracking and order history for users.
    d. Ability for buyers to initiate returns or report issues with purchases.

Tools:

HTML/CSS, PHP, MySQL, Xampp, Any suitable IDE

Supervisor:

Name: Muhammad Tahir Jan
Email ID: tahir.jan@vu.edu.pk
Skype ID: mtahirjan@outlook.com

Online Courier Management System

Project Domain / Category

Web

Abstract / Introduction

The Courier Management System is a web-based platform designed for the courier logistics industry. It allows courier and logistics companies to streamline their operations by reducing paperwork and increasing accountability for goods involved in the delivery process. The system also enables quick and easy management of transporting parcels from one point to another, as they can be easily tracked compared to traditional manual systems of recording information. With this system, messages are sent to the receiver and sender to track the parcel. Courier service employees can use the system through an easy-to-navigate graphical interface for efficient processing. Once the parcel is processed, a notification is sent with the estimated time of delivery. Customers are updated in case of any delays, and a notification is issued for pick-up. If the receiver is far away, they can request a delivery, and the delivery dashboard is updated accordingly. When the parcel arrives at the destination, the dashboard is updated to reflect delivery. This system reduces the need for manual handling at the front desk, thereby reducing the loss of goods and services and improving accountability in terms of credit.

Functional Requirements:

- The admin must submit their system credentials to access the admin side after logging in.
- After logging in, the admin is redirected to the default dashboard which displays a summary of the system data.
- The admin can now submit information for new branches through the New Branch Page of the courier company.
- The Branches page displays and manages all courier company locations.
- The system admin can create new users for specific branches.
- The Branch Staff List Page displays and manages all system users across branches.
- The New Parcel Page is where system users can submit information about parcels, including details of the sender, destination, date, time, amount, recipient and all.
- The Parcel List Page is where parcels are listed and managed. It is the page where you can view and organize all your parcels in one place.
- The Parcel List Page is the page where the parcels are displayed and managed. It provides a list of all the parcels and allows users to perform various actions on them such as adding, editing, or deleting parcels.
- The Track Parcel Page displays the current location of the client's packages.
- The Report Page displays a printable list of courier transactions with clients.

Note: More functional requirements can be added at the Admin and the User side.

Tools:

PHP, JavaScript, C#, .Net Framework, MySQL, or as per your own choice.

Supervisor:

Name: Dr. Nida Anwar
Email ID: nidaanwar@vu.edu.pk
Skype ID: nida.vu

Website for VU Blood Donation Society

Project Domain / Category:
Web Application

Abstract / Introduction:
Blood is the essential element of human body. About seven 7% of human weight consists of blood. In conventional way blood is donated though some blood organization or Blood banks. Blood bank is thought to be the place where blood is collected from the donor and stored/preserved for a period 28 to 35days for later transfusion. Blood banks also do not support online blood donor database. The number of donors are increasing with increase in population of the country thus we need to have an effective system to have better control and management of data. Using traditional techniques of data entry by operator a lot of issues may happen, like the risk of outdated data, human boredom, error in data and cost etc. Owing to solve all the problems the study is done on an automated Blood bank. In the present traditional system, the factors like gender, age, last date of blood donation, frequency of blood donation per year are not recorded which is given vital importance in this study and used as recruitment factors in blood donation. So, the prime objective of the project is to find a more efficient way in blood donor database management and to create a medium for people to get connected with potential blood donors around the locality.

Functional Requirements:

Donor:

1. Registration (After registration a donor must need administrator approval).
2. Login/logout.
3. Modifying profile (profile also contain donation history).
4. Searching record.
5. Requests for blood donation according to his/ her blood group.
6. A webpage showing patient requests according to relevant area.

Patient:

1. Registration.
2. Login/logout.
3. Modifying profile.
4. Search active donor record (There are also sleeping donners and this state will be maintained for six months from donation).
5. Requests for required blood (any blood group).

Administrator:

1. Login/logout.
2. Modifying profiles
3. Add/delete/block donor.
4. Approve donor after verification.
5. Send messages to registered donor/patient.

Tools: PHP, MySQL, Xampp Server OR any framework (React.js, Angular, Ruby on Rails or Django)

Supervisor:
Name: Abdur Rafay
Email ID: abdur.rafay@vu.edu.pk
Skype ID: live:abdurafay94

Auto Assignment Evaluation

Project Domain / Category

Web Application

Abstract / Introduction

Assignment is a great tool to assess the knowledge of students that they studied. In online learning system the number of students are huge. So, marking of a large number of assignments is very difficult and time consuming activity. Automated assignment evaluation system can help us to mark assignments quickly and efficiently. AAE is an AI based application that will check the programming assignments of C++ language on the basis of different already defined rules.

Functional Requirements:

Following are the some functional requirements of the required application.

- Provide an interface to teachers to upload assignment task in the form of MS Word document.
- Provide an interface to students to download assignment task file.
- Students should be able to upload solution code file only in .CPP format.
- Application should be able check the syntax errors and provide the feedback of errors in the form of comments.
- Teacher can define the evaluation criteria of each uploaded assignment which includes functionality and quality of code.
- The application should have automated testing of correctness of the submitted solution on the basis of rules provided by teacher.
- The application should be able to execute the code and test it with predefined inputs and expected outputs.
- The application should auto generate feedback for students, highlighting errors, suggesting improvements, and providing a grading rubric.
- The application must be able to evaluate at least C++ code.
- The application assign marks to each assignment on the basis of calculation on predefined assessment criteria and rubrics.
- The application should be web based which can be integrated to any LMS later.
- On declaration of result, students should get notification on their account.

Tools:

Python
ASP.NET
PHP

Supervisor:

Name: Muhammad Ahmad Lodhi
Email ID: ahmadlodhi@vu.edu.pk
Skype ID: ahmad_lodhi

e-Carpool

Project Domain / Category

Web based Application

Abstract / Introduction

e-Carpool is a web-based application that is designed to support the car sharing system and gives the advantage to the drivers and passengers to connect for a pool ride. The purpose of this website is to facilitate drivers and passengers in their busy schedule to have safe and economical rides from their own location.

This application provides an online experience to users to manage daily, weekly, monthly, or trip-based rides according to their needs. The drivers can manage the rides by either adding pre-defined routes (daily, weekly, monthly, trip based) or can customize their rides according to their own choices. It will keep an updated list of routes based on the demand of the users. The route information contains the location (source, destination), start time, end time, charges, no. of vacant seats for passengers.

SMS & emails will be sent to regular users on the availability of new routes and promotions or discounts. The administrator can manage the users and publish the advertisements on the request of drivers and make them available to the users.

It gives a chance to passengers to know about the upcoming rides and create the ride requests, accept the bookings, and complete the payment. A feedback form and reviews will be provided in this application to maintain customer trust and satisfaction. Users can view the feedback and reviews of other users regarding their experiences. Vehicle owners and passengers can both rate each other.

Functional Requirements:

There will be following users in this application:

- Administrator
- Drivers
- Passengers

The functional requirements of these panels are as follows:

Administrator will be able to:

- Login to allow authentication of user to access the admin panel.
- Add, update and delete the users of the system.
- View the user's profile, feedback and reviews.
- Add/update/delete information about promotions and discounts.
- Send SMS to regular customers on any promotion and discounts.
- Publish the advertisements on the request of drivers and make them available to the users.

Drivers will be able to:

- Get themselves registered in this application and then will be able to access the web site by logging into system.
- Add, update and delete his/her profile.
- Add the routes (daily, weekly, monthly, trip based).
- Customize his/her own ride according to his/her own location.
- Receive and accept the upcoming rides request.
- Update or cancel the booking.
- Add the promotions and discounts on web site as well as via SMS.
- View the feedback and reviews of users regarding their experiences.
- Provide their feedback and rate the users.

Passengers will be able to:

- Get themselves registered in this application and then will be able to access the web site by logging into system.
- Add, update and delete his/her profile.
- View/search the rides based on routes (daily, weekly, monthly, trip based).
- Customize his/her own ride according to his/her own location.
- View the upcoming rides, book the ride and complete the payment.
- Update or cancel the booking.
- View the promotions and discounts on web site as well as via SMS.
- Provide their feedback and rate the driver.
- View the feedback and reviews of other user regarding their experiences.

Tools:

Language: C#, Java, PHP
Tools: .Net Framework, NetBeans, SQL Server, MySQL etc.

Supervisor:

Name: Humaira Naeem
Email ID: humairanaeem@vu.edu.pk
Skype ID: humera_naeem

Contractor Information System

Project Domain / Category

Web Application

Abstract / Introduction

Building contracts are the mutual consignment between owner and contractor. Each and everything regarding building material and labour is discussed and signed. After that materials is purchased and labour work is started. Each contractor have multiple contacts with different owners with different requirements. That's why the expenses and labour management is hectic cost.

Contractor have to handle all this manually and sometimes it becomes difficult to track all expenditure when many construction projects are in progress in parallel. So, manual task would increase the extra burden with chances of mistakes.

The proposed web based project will tackle all the information entered on each construction site and contractor will be able to plan accordingly by viewing data.

Functional Requirements:

Functional requirements are as under:

1. Admin will be able to save information of owner and contractor i.e name, contact numbers, address etc.

2. Admin will be able to enter site detail of any new Building Project type i.e Plaza, House, etc with detail such as address, covered area, material type which will be used with brand for the following:

    i. Floor Tile, Bath Tile, Front Elevation Tile
    ii. Cement type
    iii. Gate
    iv. Water pump and Water Tank with Plumber Pipe and Tap
    v. Base, Beams
    vi. Roof Slab Type i.e RCC
    vii. Paint
    viii. Steel
    ix. Wood, Window, Door
    x. Bricks, Sand, Concrete, Stone
    xi. Electricity wire and Switches

3. Admin will register/delete the data entry users according to no. of sites on which construction and development is going on.
4. Each user will enter/edit/ delete information about material used at sites on daily basis.

5. Each user will be able to enter/edit/ delete information about persons working on sites i.e Name, Father Name, Address, and Phone, expertise (Architects, Civil Engineer, Electrical Engineer, Mason, Plumber, Painter, Interior Designer, Carpenter) with working date and time.
6. Summarized data required in report form i.e total no. of working days for each person, Labour Paid, Remaining Labour etc. Material used category wise, cost on each material, total cost etc.

Tools Used:

HTML, CSS, Java Script/ Boot Strap
PHP/Python/Java with MySql /SQL Server DBMS

Supervisor:

Name: Adnan Asif
Email ID: adnanasif@vu.edu.pk
Skype ID: ch.adnanasif

Integrated Medical Care (IMC)

Project Domain / Category

Web Application

Abstract / Introduction

Globally, the use of online health services have accelerated dramatically during the corona virus pandemic. Technology meets health care services very well in that time,but still we don't have an online integrated service of health that provide every thing like book an appointment a doctor expert in specific domain,Home laboratory collection services,patient transfer service(ambulance),home nursing services and online pharmacy services under a single umbrella . IMC is such an online integrated health care service providers that can provide all these services through a website. So, there is a need to develop an E-commerce website that helps different health care providers like hospitals /clinic ,pathology labs,pharmacies and ambulance service providers to get register on IMC. The core objective of the IMC project is to develop a website that facilitates the health care service providers to registers into this web portal and update regarding doctors , screening test , quality medicines etc on comparative and discounted rates with 24/7 medical care at home.

Functional Requirements

Administrator Panel:

- ✓ Manage login process to allow the authentic user to access the admin, patient/customer, and health care service providers(like doctor,hospitals/clinic ,pharmacy,ambulance transport providers etc).
- ✓ Create and manage their account.
- ✓ Keep the record of health care providers (like name,doctor fee,Price of particular medicine or test, ambulance transport fare etc)
- ✓ Keep agreement between health care providers and administrator on quality.
- ✓ Add/update/delete specific health care provider record.
- ✓ Record the patient/customer feedback
- ✓ Keep the record of the customer.
- ✓ Add/update/delete customer.
- ✓ Keep the record of patient/customer order or request status.
- ✓ Set the fee of doctor according to doctors qualification, experience and rating etc.
- ✓ Manage the record of customers.
- ✓ Manage customer history.
- ✓ Manage the rating of health care providers.
- ✓ Deliver the order to the customer/patient.
- ✓ Receive the fee payment from a health care providers .
- ✓ Send promotions to registered customers by offering discounts and promotions and also a rating of health care providers.
- ✓ Manage revenue and expense records.
- ✓ Inventory management record.
- ✓ Keep a record of customer feedback.

Health care service providers panel:
The panel will do the following:

- ✓ Create an account or register him/herself on IMC
- ✓ A health care service provider will sign in.
- ✓ A health care service provider accept IMC Terms and conditions.
- ✓ Add/Update/Delete the service charges
- ✓ Deliver the order to the customer/patient
- ✓ Receive payment.

Customer panel:

- ✓ Create an account or register him/herself on IMC.
- ✓ View the health care providers
- ✓ View the rates/prices
- ✓ View the health care providers ranking.
- ✓ Place the order by selecting the mode of payment.
- ✓ Confirm the order.
- ✓ Delete the order before confirming it.
- ✓ Submit feedback.

Tools:
Visual Studio, .NET Framework, C#/Java, SQL Server

Supervisor:
Name: Nadia Tabassum
Email ID: nadiatabassum@vu.edu.pk
Skype ID: nadia.vu.cs

Learning Management System for Formative assessment of Academic Courses

Project Domain / Category

Web Application

Abstract/Introduction

The introduction of computerized formative assessments in the classroom is viewed as an important means to understand learners' performance in the learning process. Generating high-quality examination questions manually by teachers is a time-consuming task. Secondly, it is not easy for teachers to perform immediate assessment of subjective questions. Automatic generation of subjective and objective questions and evaluating their answers is highly challenging task in natural language processing and educational technology.

The aim of this project is to design a Learning Management System to enhance the learning experience by providing personalized, adaptive quizzes and subjective questions tailored to individual students' progress and areas of improvement. The system could leverage machine learning algorithms to analyze students' performance, identify weak areas, and generate targeted formative questions and automatic evaluation to strengthen student engagement and academic success.

Functional Requirements:

Learning Management System with computerized formative assessments for both objective and subjective questions where all students could be tested at the same time and with the same number of test administrations during the semester.

The proposed system will have the following main users:

Admin Teacher and Student.

1. Registration module: It will facilitate the registration process for students and teachers. Admin will approve and perform activation of the students and teachers accounts and registration requests.
2. Login Module: After successful registrations, all types of the users will be able to login to the system using their registered email and password.
3. Your application will assist the teacher with the automatic generation of quizzes and subjective questions.
4. Furthermore, your application will generate the objective and subjective questions of computer science courses including Operating System, Data Structure, Theory of Automata and Introduction to Programming Using C++.
5. Teacher can gather a labeled dataset of existing objective and subjective questions and their correct answers.
6. Learning Management System is able to generate multiple-choice, true/false, and matching questions and Option to specify difficulty levels for questions.
7. Train a supervised machine learning model (e.g., using a classification algorithm) to generate objective and subjective questions based on the learning patterns from the dataset.
8. Train a supervised model (e.g., a classification model) to assess the correctness of objective and subjective question answers.
9. Teaches can able to do Integration of automated generation of questions with a question bank for diverse content of different computer science courses.

10. Teachers have support for various automatic subjective question formats like short, long answer questions and problem-solving questions.
11. Teachers are allowed for automatic customization of scoring rubrics for different subjective questions.
12. Teachers able to define Rubrics for assessing subjective questions, considering factors like content, structure, and depth.
13. Teachers are able to generate overall performance reports for individual students enrolled in different courses.
14. Teacher is able to perform analytics to track question effectiveness and identify challenging topics.
15. Student is able to get immediate feedback on objective and subjective question responses, including correct answers and explanations, to facilitate learning and self-assessment.
16. Ensure the platform is mobile-friendly, allowing students to access learning materials and assessments on various devices, including smartphones and tablets.
17. The platform should adapt and recommend personalized learning paths based on individual strengths and weaknesses identified through assessments.
18. Ensure that the platform supports multiple languages to accommodate a diverse student population.
19. Allow students to share their achievements or ask questions via social media integration, promoting a sense of community and enabling broader discussions.
20. Include a help center, FAQs, or chat support to assist students in case they encounter any issues or have questions about the platform.

Tools: JSP, PHP, Python, JavaScript/HTML/CSS, PyTorch, Keras and TensorFlow, JSP, MySQL

Supervisor:
Name: Muhammad Umar Farooq
Email ID: umarfarooq@vu.edu.pk
Skype ID: live:umarvc

Maritime Education System & Job Portal

Project Domain / Category
Web Application

Abstract / Introduction
The Maritime Education System and Job Portal is a web-based platform designed to provide a comprehensive resource for maritime education and job opportunities within the maritime industry.

This proposal outlines the development of a website that will offer a wide range of maritime courses and training programs while also serving as a job portal for industry-specific job postings.

The Maritime Education System and Job Portal will be a central platform for maritime education and employment opportunities. This system will allow administrators to manage courses, training programs, and job listings, while students and job seekers can browse and apply for courses and employment opportunities.

Objectives
- To create a one-stop platform for maritime education and job-related activities.
- To facilitate the seamless management of maritime courses, training programs, and job listings.
- To provide users with advanced search and application features.
- To ensure data security and user privacy.
- To support the growth and development of the maritime industry workforce.

Scope
The platform will cover various aspects of the maritime industry, including education and employment. It will provide a user-friendly interface for both job seekers and employers to find relevant opportunities.

Functional Requirements:
Our Complete System will have:
- **Maritime Education System:**
  - Course and training program management
  - User registration and profile creation
  - Course and program search and filtering
  - Application for courses and programs
  - Course progress tracking
  - Messaging and notifications
- **Maritime Job Portal:**
  - Job posting and management
  - Employer registration and profile creation
  - Job search and advanced filtering
  - Job application submission
  - Communication with job applicants
  - Resume storage for job seekers

- **User Roles**
  - Administrator
  - Student (Course Applicant)
  - Job Seeker
  - Client (Employer)

The website will be developed using a client-server architecture with RESTful APIs for communication. Data will be stored in a relational database for scalability and security.

Conclusion

The Maritime Education System and Job Portal website project aims to provide a valuable platform for maritime education and employment opportunities, making it easier for individuals to access training and job openings within the maritime industry. We are excited about the potential impact of this project and look forward to your approval and collaboration to bring this platform to life.

Tools:

- Frontend: HTML5, CSS3, JavaScript, React
- Backend: Node.js, Express.js
- Database: PostgreSQL or MySQL
- Authentication: JWT (JSON Web Tokens)
- Hosting: AWS or Azure
- Version Control: Git

Supervisor:

Name: Zaid Ismail
Email ID: zaid.ismail@vu.edu.pk
Skype ID: m.zaid_1994_1

MOBILE PHONE DATA EXTRACTION AND RECOMMENDATION SYSTEM USING MACHINE LEARNING

PROJECT DOMAIN / CATEGORY

Web Application

ABSTRACT / INTRODUCTION

This Project proposes the development of a comprehensive system that extracts mobile phone data from online sources and compiles a data-set containing essential fields related to mobile phones, including brand, model, specifications, and images. The collected data-set will serve as the foundation for training a machine learning model that aids users in selecting the most suitable mobile phones based on their preferences and needs. Additionally, the model will predict resale values, assess parts availability, and estimate repair costs, ultimately providing recommendations on the best mobile phone models.

FUNCTIONAL REQUIREMENTS

Data Collection and Scraping:

1. Develop web scrapers to extract mobile phone data from various online sources, including e-commerce websites, manufacturer websites, and review platforms.
2. Gather information such as brand, model, screen size, screen type, refresh rate, storage size, RAM size, charging port type, battery capacity, charging watts, and network technology.
3. Retrieve image paths for each mobile phone for future display.

Data Pre-processing:

1. Clean and structure the collected data, handling missing values, duplicates, and inconsistencies.
2. Standardize data formats and categorize information for efficient analysis.

Data-set Compilation:

Create a dataset that compiles the extracted mobile phone data, making it available for model training and analysis.

Machine Learning Model:

1. Develop a machine learning model that considers user preferences and requirements to recommend mobile phones.
2. Implement features for predicting resale values, assessing parts availability, and estimating repair costs.

User Interface:

1. Design an interactive web application where users can input their preferences and requirements for a mobile phone.
2. Display recommended mobile phone models along with the mobile picture and all relevant details based on the machine learning model's predictions.

Feedback Mechanism:

Integrate a feedback system for users to provide insights, helping improve the model over time.

Legal and Ethical Considerations:

1. Ensure compliance with copyright and data usage regulations when scraping data from external sources.

2. Implement privacy and data protection measures to secure user information.

PROJECT BENEFITS

1. **Informed Decision-Making**: Users will have access to comprehensive information to make informed choices when selecting a mobile phone.
2. **Time Efficiency**: The system automates the data collection and analysis process, saving users time on research.
3. **Cost Savings**: Predictions on resale value and repair costs help users assess the long-term value of their investment.
4. **Enhanced User Experience**: A user-friendly interface simplifies the process of selecting the best mobile phone based on individual needs.
5. **Eco-Friendly**: By predicting resale value and parts availability, the system encourages sustainability by extending the life of mobile devices.

TOOLS:

- **Programming Languages**: Python for web scraping, data processing, and machine learning. Web-based technologies (HTML, CSS, JavaScript) for the user interface.
- **Web Scraping Tools**: Utilize libraries like BeautifulSoup and Scrapy for web scraping.
- **Machine Learning Framework**: Employ machine learning libraries (e.g., scikit-learn, TensorFlow) for model development.
- **Data Storage**: Use a database (e.g., PostgreSQL or MySQL) to store and manage the collected data. You can also use Excel.
- **Deployment**: Deploy the web or mobile application on a Local server.

LEGAL AND ETHICAL CONSIDERATIONS

1. Respect copyright and data usage regulations when scraping data from external sources.
2. Implement privacy and data protection measures to secure user information.

SUPERVISOR:

Name: Khaqan Khawer
Email ID: khaqan@vu.edu.pk
Skype ID: imkhaqan

Multilingual News/Article Website (Next.js/Strapi/Postgres)

Project Domain / Category

Web Application

Abstract/Introduction

To create a multilingual news/Article website using the Jamstack architecture, you'll need a set of requirements and components to ensure a smooth and efficient implementation.

Here are the key functional requirements for such a website:

1**. Content Management System (CMS):** Choose a headless CMS that supports multiple languages and allows for easy content creation and management. Popular options **Strapi**.

2. **Content Localization**: Ensure that your chosen CMS provides support for content localization, allowing you to store and manage content in multiple languages.

3. **Static Site Generator (SSG):** Select a Jamstack-friendly SSG **Next.js** to generate static HTML files for your website. These SSGs can easily handle multilingual content.

4. **Language Switcher:** Implement a language switcher on your website that allows users to switch between different languages (Urdu/English only). This can be a dropdown menu, flags, or text links, depending on your design.

5. **Internationalization (i18n) Library:** Utilize an **i18n** library like react-i18next or vue-i18n to handle text translations within your web application. This will help manage translations within the user interface.

6. **URL Structure**: Develop a clear and SEO-friendly URL structure that includes language codes (e.g., example.com/en/news) to differentiate content for search engines and users.

7. **SEO Optimization**: Implement proper meta tags for each language version of your content to improve SEO and search engine ranking in different regions.

8. **Responsive Design**: Ensure that your website is responsive to various screen sizes and devices to cater to a diverse audience.

9. **Feedback Mechanism**: Provide the user to comments on your news or articles

By meeting these requirements, you can develop a robust and user-friendly multilingual news website using the Jamstack architecture.

10. Subscription Renewals and Notifications: Implement renewal reminders and notifications for users in their chosen language to ensure they don't miss important subscription events.

Administrative Roles

Roles in the admin area of a multilingual news website typically involve two levels of access a

1. Super Admin / Administrator:
- Responsibilities: Overall site management, user management, access to all features, content moderation, and configuration settings.
- Access: Full access to all admin functionalities.

2. Content Editor / Manager:
- Responsibilities: Content creation, editing, and publishing. Managing articles, images, videos, and other media. Ensuring content is accurate and up to date.
- Access: Access to content management features.

3- Frontend Users

Frontend users can enter their article in both languages Urdu/English.

NOTE :

There must be different categories for the news like political, social, religious, local, global, sports, money market, fashion etc.

Tools:

Indicate development environments / IDEs / Any other tools required in this project

1. **React.js**
2. **-Next.js**
3. **-Strapi**
4. **-Postgres**
5. ***-SendGrid (Email Marketing Tool)***
6. ***-Cloudinary for pictures***
7. ***-VS Code***

Supervisor:

Name: Amjad Iqbal Khan
Email ID: amjad.iqbal@vu.edu.pk
Skype ID: amjadiqbalkhanniazi

Bazaar.com –Online Shopping Mall

Project Domain / Category

Web Programming

Introduction

An online shopping mall, often referred to as an e-commerce marketplace or virtual shopping center, is a digital platform that brings together multiple retailers and sellers to offer a wide range of products and services to consumers over the internet. It provides a convenient and centralized location for people to browse, compare, and purchase a diverse array of goods, including clothing, electronics, home appliances, books, and much more. These platforms host numerous individual sellers, brands, and retailers within a single website. Sellers can set up their virtual storefronts and list their products for sale, making it a competitive marketplace where consumers can compare prices and offerings. Shopping in an online mall is incredibly convenient, as it can be done from the comfort of one's own home, office, or even on the go using mobile devices. This eliminates the need for physical travel and allows customers to shop at any time, 24/7.

This website (online Mall) will have a homepage that showcases featured or new products. Products are usually organized into categories (e.g., electronics, clothing, home decor, etc.). Users can browse these categories to find the type of products they are interested in. An essential feature is a search bar that allows users to search for specific products or brands. A user will be able to purchase / make order against available items after getting registered or as a visitor on the website and passing through the payment method (cash on delivery). The website will provide interactive interfaces and rich search facility for finding different types of products through different filters. The website will allow its registered users/visitors to record their comments/reviews against any purchased item. The comments / reviews will be published on the website with the item information. Besides, the registered users will be able to submit their complaints / feedback regarding the website services.

Functional Requirements:

Following are key functional requirements for the proposed system:

1. **User Registration/Sign Up, Sign in:**
   There will be proper **interfaces** for user registration and Sign in for the following **four** types of the users of the website:
   - Visitor (Unregistered User)
   - Registered user (Buyer/Customer)
   - Registered user (Seller)
   - Registered user (Administrator)

   Note: During signup you can have a field asking his/her role.

   Roles of the users will be as follow:
   - **Visitor** will be able to visit the website to search products on the website and can buy but won't be eligible for a discount.
   - A user registered as a **Buyer/Customer** will be able to place order on the website with special **discount of 5%**.

- A user registered as a **Seller** will be able to open a store on the website and can sell goods.
- The **Administrator** (Admin) will have all the **rights/privileges:**
  - ✓ of information management regarding the **items**, **stock** management, as well as **user** management.
  - ✓ Admin will approve the registration requests from the other users (Buyer/Seller).

2. Admin Panel:

- There will be a proper Admin Panel through which the Admin will be able:
  - ✓ to perform category management of product as well as
  - ✓ user management (accepting / rejecting user registration requests).

3. Seller Panel:

- There will be a proper Dashboard comprising of interactive interfaces through which a **Seller** can **add / delete / update** all information such as description, price, stock, images etc. of products.

4. Search facility:

- The website will provide interactive interfaces and rich search facility for finding different types of products through different filters.
- User can search by:
  - ✓ product name
  - ✓ category
  - ✓ Company name / Brand
  - ✓ Pricewise
  - ✓ New arrival
  - ✓ Sale
  - ✓ Best sellers
- Search results will be displayed on the screen showing the image, name, and company name etc. of the product(s).
- If the user clicks on any specific image:
  - ✓ All detailed info about it will be displayed including the seller shop name/quantity available and size (if applicable) etc.

5. Placing Order on the Website:

- The website will allow the visitor / registered user to make order against their selected items. There will be proper interfaces on the website in this regard.
- The user will first have to select the item to put into the **shopping cart**, and then will have to pass through any of the payment method which will be:
  - ✓ cash on delivery only.
- **Confirmation Email on transaction (Order Placing):**
  - ✓ A confirmation email on successful transaction will be sent to the user's provided email.

6. Comments / Reviews:

- The visitors / registered users will be able to submit their comments / reviews on the website against any purchased item.
  - ✓ They should be able to upload any image(s) in support to their reviews.

7. Complaints / Feedback

- The registered users/visitors will be able to submit their complaints / feedback regarding the website services through related interface on the website. This information will be submitted to Admin.

Note: Visitor's feedback should be saved in the database as anonymous user (or if he/she provide his/her name).

8. Inventory of products:

- This project will have a back-end database where information about all types of users is stored.
- All types of information about **bought/sold** products is kept.
- So, you need to maintain the product inventory. Means, if a shirt of a specific brand (belonging to a certain seller) is sold, the available stock must be made one less right away.

Tools:
1. PHP and MySQL (You can choose any framework such as Laravel)
2. Bootstrap or any other CSS Framework.
3. Any JavaScript library/ framework such as jQuery, Vue Js, react Js or angular Js

Supervisor:
Name: Ayyaz Altaf Mirza
Email ID: Ayyaz.altaf@vu.edu.pk
Skype ID: live:.cid.71f50448c186e933

Online Toys Finding Application

Project Domain / Category

Web Application

Abstract / Introduction

In this project, we will build a web based application named as “Online Toys Finding Application”, in which the user will search for particular toy(s), purchase it and the admin will deliver the toy(s) to the user.

Admin panel features

1. Admin can login/logout.
2. Admin can add, update and delete different categories of toys.
3. Admin can add, update and delete different toys information such as toy name, picture, price, quality etc.
4. Admin can view the order of the user in which all details should be visible to the admin like, selected Toys, total price, shipping address etc.
5. Admin can generate voucher for the user.
6. Admin can verify the user online dues or paid vouchers and after the verification, the Admin can deliver the order.
7. Admin can add, update, and delete the shipping charges city wise and when the user provide city name in the shipping address, the shipping charges should automatically added with the total price of the order.
8. Admin can view the user request for a particular toy and can provide feedback accordingly.
9. Admin can manage the stock.
10. Admin can manage expense reports.
11. Admin can manage profit reports.

User/Parent panel features:

1. User can register.
2. User can login/logout.
3. User can update his/her profile.
4. User can search the toys as per his/her choice.
5. User can view all the available toys information such as toy picture, its category, price, etc.
6. User can send a request for a particular toy (if not available). At the time of request, the user should provide some information like toy name, picture (if available) and further description of the toy.
7. User can add as many as per his/her choice toys to the shopping cart.
8. User can add or delete any item from the shopping cart.
9. The Total Price of toys should be automatically adjusted after the addition or deletion of toys in the shopping cart

10. User should provide the complete shipping address, when the user confirm the order.
11. User can pay the total dues online or the user can download the voucher and paid it and then upload the paid voucher.
12. User can check the status of his/her order.

Tools:
XAMPP Server, MySQL, PHP language

Supervisor:
Name: Akmal Khan
Email ID: akmalkhan@vu.edu.pk
Skype ID: akmal_vu

Police Management Information System (PMIS) for Staff and Criminals Data

Project Domain / Category

Web Application

Abstract / Introduction

Management Information System (MIS) is a computer-based system consisting of hardware, software, networked devices, and information that serves as the backbone for any organization. An MIS gathers data from multiple online systems or resources, analyzes the information, and produce reports to aid in decision-making.

Police Management Information System (PMIS) for staff and criminals data is a web portal that is used to convert the manual information system of Police department into online web system. This system is capable to collect online data from various police stations located in various districts of the province. The Police stations will connect to the portal through VPN or App, using authentication mechanism of username and password. The collected information includes the Police staff and criminals data that will be provided by the administrations of Police stations, located at far flung area of the province.

This system will facilitate each level of management in Police Department. Using this portal, the top, middle and low level management of Police gains the information about police staff and criminals to improve their performance and carry out optimal decision making for keeping piece in districts and province.

Functional Requirements:

User:

- The user will login to the system using authentication mechanism
- Search the District, Tehsil and Police station
- Add the staff and criminal's data at police station level
- Search/Edit/Delete the data at police station level
- Search and view the staff and criminal's data at Tehsil and District level
- Generate reports at police station levels
- Generate reports at Tehsil level about staff and criminals
- Generate reports at District level about staff and criminals

Administrator Login: An authorized admin can login to the system to:

- Assign/update/delete username and password to end-users
- Add the name of Districts, Tehsil and Police stations
- Edit/delete the name of District, Tehsil and Police station
- View/edit/delete the District, Tehsil-wise staff and criminal's data
- View/edit/delete the police station-wise staff and criminal's data
- Generate various reports about staff and criminals at different levels

Tools:

Indicate development environments / IDEs / Any other tools required in this project

Front-end:

- HTML
- CSS
- JavaScript

Back-end:

- PHP
- MySQL

Supervisor:

Name: MIR SALAM KHAN
Email: mir.salam@vu.edu.pk
Skype ID: live:.cid.9a335075328c714a

Progressive Website for a Training Company

Project Domain / Category

Web Application

Abstract / Introduction

Imagine yourself as a full-stack developer working for a dynamic company that specializes in providing comprehensive vocational and technical training solutions. Our company is dedicated to empowering professionals and students with diverse learning methods, including online instruction (e.g., Zoom and Microsoft Teams), in-person sessions, and a robust Learning Management System (LMS) platform (utilizing third-party solutions like OpenEdX or Moodle). The core objective of this project is to design and manage a progressive web application that helps in the efficient management of students, trainers, courses, and training events. Additionally, the application will host a company portfolio and blog section.

Functional Requirements:

Some of the functional requirements are:

- **FR1.** **Company Portfolio Website:**
  Create an engaging and informative website to showcase the company's portfolio, including its training programs and achievements.
- **FR2.** **User Management:**
  Implement user authentication and authorization to differentiate between students, trainers, and administrators.
- **FR3.** **Courses Management:**
  Develop a system for creating and managing courses, including course descriptions, schedules, and materials.
- **FR4.** **Trainer Profile Management:**
  Allow trainers to create and manage their profiles, including their qualifications and schedules.
- **FR5.** **Student Management:**
  Create a user-friendly interface for students to register, access course information, and track their progress.
- **FR6.** **Training Event Management:**
  Enable the scheduling and management of training events, including both online and in-person sessions.
- **FR7.** **Training Venue Management**
  Develop a system for creating and managing different Training Venue
- **FR8.** **Payment Management:**
  Implement a payment method (available in Pakistan) to manage course fee payments, ensuring secure and convenient transactions.

Tools:

For the development of this application, you have the flexibility to choose the tools and programming languages you are most comfortable with. However, it is recommended to explore advanced technologies like JAMstack or the MERN stack for building a robust and responsive web application.

Supervisor:

Before finalizing the project, it is highly advisable to discuss the project details with me.

Name: Abdullah Qamar
Email ID: abdullah.qamar@vu.edu.pk
Skype ID: abdulaha462.

School Automation System

Project Domain / Category

Web Application

Abstract/Introduction

School Automation is a Web application that will assist school Administration Staff, Teachers, Students and Parents. The proposed application will provide interfaces for all Staff members for entry, update, delete and search etc. The developed application should be able to produce report against a specific task when required like to find the Total Number of employees, students, attendance record. Transcript or Result, employee, student profile, fee voucher can also be generated using Reports facility. Student attendance is made easy by opening the student attendance interface, where the teacher can easily mark the student's attendance as "Present" or "Absent" by clicking the student ID or Name. The Teacher Interface should allow teacher to press Save button to mark attendance in database. Also this interface should provide student's attendance percentage. Staff/ Teacher interface should follow procedure to make sure their presence by marking their attendances in required interfaces. Teacher interface will also allow teacher to provide Lecture Schedule, Opening Lecture, Uploading Assignment, and Quiz and these activities should be visible to all students of a particular class. Parents should also be provided an interface for giving feedback about the teacher, child performance etc.

Functional Requirements:

Some common functional requirements are:

1. Create Admin Login
2. Making User friendly interfaces
3. Provide Entry, Update, Delete, and Search
4. Impose validation check on all entry, update, delete, search interfaces
5. Student Registration
7. Course selection
8. Recording Attendance
9. Fee /Salary calculation
10. Submitting fee
11. Uploading/ Solving assignment (Teacher/ Student)
12. Uploading/ Solving Quiz (Teacher/ Student)
13. Teacher / Staff member interface to check salary
14. Report generation of Pass fail, Fee voucher, Total no. of Student in a Class or per year / specific year, salary slip, DMC, Degree.

Tools: Optional (Python, SQL Server/ SQLITE, PHP, C#/ VB.Net etc.)

Supervisor:

Name: Muhammad Luqman
Email ID: m.luqman@vu.edu.pk
Skype ID: mluqman.vu

Smart Home Made Food Shop

Project Domain / Category

Web Application

Abstract / Introduction

Now a days, a lot of students, working professionals and many other people who have to stay away from their homes in apartment, rooms or hostels for some period due to their study, job or due to any other reason. Many of these individuals always want and prefer to eat only home cooked foods instead of outside foods due to many reasons. Some of the major reasons are unhealthy, unhygienic, highly expensive, usage of extra high spices in foods and low quality of foods available at the most of the food restaurants. On the other hand, homemade foods are very healthy, nutritious and hygienic. The home cooked food is prepared by washed hands in a fresh and clean environment. Whereas, most of the restaurant owners are business-oriented, they do not care about customer's hygiene and their health. Therefore, many individuals are always in search of homemade foods as it is more healthier, contains good quality and nutritious value than the food served in the restaurants. In this scenario, this project aims to benefit these customers as well as the home cooked food sellers, promoting homemade food as a healthier and more personalized alternative to traditional restaurant meals. It will be very convenient for these customers to find and get good quality of home cooked foods from their nearby locations according to their needs and choice. It will also be beneficial for the home food shop owners to earn from these customers by providing good quality home-made food services to them. Using this application, customers can register, login and view all the available nearby home-made food shops. Customer can filter and select any shop according to their choice and previous ratings of the home-made food products. Similarly, the home food shop managers can also get customers by registering and logging into the website and setting up their home food shop profile. After a customer orders a specific home made food item from a shop, the relevant home food shop will deliver the order to the customer's address.

Functional Requirements:

There will be four users of this system.

1. Administrator
2. Home Food shop Manager
3. Customer (Registered user)
4. Unregistered Customer (Guest user)

1. Functionalities of Administrator

- Admin can Add, Edit, Delete and View Home Food shop profile.
- Admin can Approve / disapprove Home Food shop's registration request.
- Admin can Add, Edit, Delete and View customers.
- Admin can Add, Edit, Delete and View Home Food item categories.
- Admin can Add, Edit, Delete and View Home Food items.
- Admin can Add, Edit, Cancel and View customer orders.
- Admin can Add, Edit, Delete and View Home Food shop location on map.
- Admin can Check order status.
- Admin can check the rating given by customers about each Home Food shop.
- Admin can check average rating of each Home Food shop.

- ❖ Admin can check the remarks given by customers about each Home Food shop.
- ❖ Admin can block a Home Food shop account in case of continuous poor rating.
- ❖ Admin can view the customer complaints and take appropriate actions.
- ❖ Admin can generate a report on a monthly, weekly basis for the total number of orders and their successful handling.

2. Functionalities of Unregistered Customer (Guest User)

- ❖ Any unregistered customer (guest user) can only Search and view the registered Home Food shops in the system.
- ❖ Any unregistered customer (guest user) can only Search and view any items according to specific filters (item name, category, price, location and rating etc.) of any registered Home Food shop.

3. Functionalities of Registered Customer (Registered User)

- ❖ Customers can register and login to the system.
- ❖ Customers can Add, Edit, Delete and View their profile details.
- ❖ Search and view Home Food shops and its food items in a proper layout on the website.
- ❖ Search and view any available items according to specific filters (item name, category, price, location and rating etc.) of any registered Home Food shop.
- ❖ Order any available Home Food items from any registered Home Food shop.
- ❖ Check order status.
- ❖ Give feedback or any complain about Home Food shop if any issue caused during/after placing order.
- ❖ Give Rating: Customers can give rating to the concerned Home Food shop after the completion of order according to his/her satisfaction.
- ❖ Pay bill: Upon successful completion of any order, customers can either pay the amount to the concerned delivery person on the spot or can transfer the amount to the concerned Home Food shop's account number available on the website.

4. Functionalities of Home Food shop Manager

- ❖ Managers can register and login to the system.
- ❖ Managers can Add, edit, delete and view all items, categories and all information of their Home Food shop in the system.
- ❖ Managers can Add Home Food shop's menu with specific details such as Home Food item name, picture, price, delivery time etc.
- ❖ Managers can Manage orders.
- ❖ Managers can Cancel orders.
- ❖ Managers Update order status.
- ❖ Managers can View report of daily, weekly and monthly sale.
- ❖ Managers can View any complaints of the customer.
- ❖ Managers can check the rating given by the customers.
- ❖ Managers can check any remarks (if given) by the customers.

[Note: Student can add/enhance requirements as per need and keeping the time span and scope in view.]

Tools:
ASP.NET, C#, React JS, Node JS, HTML, CSS, JavaScript, Ajax, JQuery, Bootstrap, MS SQL Server

Supervisor:
Name: Syed Hassan Ali Shah
Email ID: hassan.ali@vu.edu.pk
Skype ID: syed.hassan.ali.sha@outlook.com

Travel Mates- Your Ultimate Travel Companion

Project Domain / Category

Web Application

Abstract / Introduction

The "Travel Mates" project aims to develop a user-friendly web application that empowers travelers to plan and organize their trips effortlessly. With a focus on ease of use and comprehensive features, this application will provide an all-in-one solution for travel planning, accommodation booking, and exploration of tourist attractions.

Functional Requirements:

Following are some of the functional requirements:

User panel:

1. **User Registration and Profiles:**
   Users can create accounts with personalized profiles.
   Profile information includes name, contact details, and travel preferences.
2. **Trip Planning:**
   Users can create and manage multiple trips.
   Each trip allows customization with details like destination, dates, and trip purpose (e.g., vacation, business, adventure).
3. **Destination Information:**
   Users can search for destinations and access detailed information, including climate, local culture, and popular attractions.
4. **Accommodation Booking:**
   Integration with external APIs for real-time hotel and accommodation booking.
   Users can view options, check availability, and make reservations.
5. **Navigation and Maps:**
   Interactive maps with route planning, GPS coordinates, and offline map downloads.
   Directions and travel distances to chosen points of interest.
6. **User Reviews and Ratings:**
   Users can leave reviews and ratings for accommodations, attractions, and restaurants.
   Aggregate ratings and user comments provide insight for other travellers.
7. **Weather Information:**
   Real-time weather updates for destinations.
   Weather forecasts for trip duration.
8. **User Notifications:**
   Notifications for trip reminders, booking confirmations, and recommended activities.
   Customizable notification settings.
9. **Payment method:**
   User will be able to pay for the trip with any of the following payment method.
   a. Debit card
   b. Credit card

Admin panel:

Admin will do the following tasks:

1. **User Management:**
   Create, edit, and delete user accounts.
   View user profiles and access registration details.
2. **Content Management:**
   Add, edit, or remove destination information, including descriptions, images, and attractions.
   Approve or moderate user-generated reviews and ratings.
3. **Trip and Itinerary Management:**
   Access and review user-created trip.
   Resolve issues or conflicts related to trip planning and accommodations.
   Provide assistance or recommendations to users planning trips.
4. **Accommodation Management:**
   Access the accommodation booking system.
   Monitor bookings, confirmations, and cancellations.
   Handle payment or reservation disputes and refunds.
5. **Notification Management:**
   Send and manage notifications to users, including trip reminders, booking confirmations, and general updates.
   Configure and schedule automated notifications.

Tools:

- Programming languages:
  PHP
  HTML, CSS, JavaScript
  SQL (e.g., MySQL)
- Frameworks:
  PHP Framework (e.g., Laravel, Symfony)
  Front-end Framework (e.g., React, Angular, or Vue.js)
- Tools and Editors:
  Code Editor (e.g., Visual Studio Code, Sublime Text, PHPStorm)
  Database Management (e.g., phpMyAdmin, MySQL Workbench)
  API Integration Tools (e.g., Postman, Guzzle for PHP)
  Project Management Tools (e.g., Trello, Asana, Jira)
  Web Server (e.g., Apache, Nginx)
  User Interface Design Tools (e.g., Adobe XD, Sketch, Figma)

(**Note**: Student can use any other tool/editor as per his/her choice, with same programming language)

Supervisor:

Name: Komal Saleem
Email ID: komal.saleem@vu.edu.pk
Skype ID: komalsaleem123

Weblogr

Project Domain / Category

Web Programming

Abstract / Introduction

In today's digital age, the internet has become a primary medium for information sharing, personal expression, and communication. One of the most prominent forms of online content is the blog. A blog is a versatile and powerful tool that serves various purposes, including personal journals, informative articles, storytelling, business promotion, and more.

"**Weblogr**" is a blog platform. This blog platform project aims to create a web-based application that allows users to publish, edit, and manage their own blogs. This platform will provide a user-friendly interface for both bloggers and readers. Registered users will have the ability to create, edit, and publish blog posts, categorize their content, and interact with other bloggers through comments and likes. Readers can browse and search for blogs, leave comments, and follow their favorite bloggers.

Functional Requirements:

1. **User Registration and Authentication:**

   - Users should be able to register with the platform by providing basic information (e.g., username, email, password).
   - Implement email verification to ensure the validity of user accounts.
   - Users should be able to log in and log out of their accounts securely.
   - There will be two types of users:
     - Administrator
     - Common user
   - A default "Administrator" account should already be available and its user type (in database) should be "Administrator". Whereas, all other user's type should be set to "User" in the database.

2. **User Profiles:**
   - Each user should have a profile page displaying their basic information, profile picture, and a list of their published blog posts.
   - Users should be able to edit their profiles, change their profile pictures, and provide a short bio.

3. **Blog Creation and Management:**

   - Registered users should have the ability to create, edit, and delete blog posts.
   - The blog editor should allow for rich text formatting, including text styles, images, and links.
   - Users should be able to categorize their blog posts into different topics or categories.
   - Include an option to save drafts of blog posts before publishing.

4. **Blog Viewing and Interaction:**

    - Readers should be able to view and search for blog posts by category or keyword.
    - Implement a user-friendly and responsive blog reader interface.
    - Readers should be able to like and comment on blog posts.
    - Provide a feature to follow specific bloggers to receive updates on their new posts.

5. **Comments and Interaction:**

    - Users should be able to leave comments on blog posts.
    - Implement a notification system to alert users about new comments on their blog posts.
    - Include a system for liking and replying to comments.

6. **Content Management:**

    - Implement a content management system for administrators to monitor and moderate user-generated content.
    - Allow administrators to suspend or ban users who violate community guidelines.

7. **Search and Filtering:**

    - Implement a search functionality that allows users to find specific blog posts by keywords, categories, or authors.
    - Include filters for sorting blog posts by date, popularity, or user ratings.

8. **Security and Privacy:**

    - Ensure the security of user data and passwords through encryption and best security practices.
    - Allow users to set their posts to private if they wish to limit access.
    - Implement CAPTCHA or other mechanisms to prevent spam and abuse.

9. **Responsive Design:**

    - Develop a responsive and mobile-friendly design for the platform to ensure usability on various devices and screen sizes.

10. **Analytics and Reporting:**

    - Provide users with statistics on their blog post views, likes, and comments.
    - Implement a reporting system so that users can report inappropriate content or abuse to website administrator.

11. **Notifications:**
    - Implement a notification system to alert users about new comments, likes, and followers.

Project Deliverables:

- Fully functional blog platform website
- User documentation and instructions for using the platform
- Administrative documentation for content moderation and user management

Tools:

- HTML, CSS, JavaScript
- Bootstrap for responsive design
- PHP for server-side scripting
- MySQL for the database
- User authentication libraries or frameworks (e.g., PHP's password_hash and password_verify)
- AJAX for real-time interaction

Supervisor:

Name: Muhammad Ilyas
Email ID: muhammad.ilyas@vu.edu.pk
Skype ID: live:.cid.813fc730d8c19cf8

A CONSTRUCTION PROCUREMENT SYSTEM

Project Domain / Category

Web or Desktop

Abstract / Introduction

Develop a software system to manage the procurement process for a construction company. In simple term, Procurement is defined as act of buying products or services for commercial purpose. It is most important department in construction field where procurement in the process of getting all the materials and labor needed to complete project in time.

Main purpose of the system is keeping an eye on supply chain risk monitoring. It helps to improve the procurement process and boost the efficiency and accuracy. It automates the entire source to pay cycle. System shows the availability of supplier, services and products in market. It uncovers the purchasing trend and offers list of products and services respectively.

It also helps to improve the control on all procurement processes and increase visibility within organization. It helps to standardize the purchasing process to make employees and vender's lives easy. Suppliers enjoy opportunity to get register in the system and make themselves permanent and trustworthy vendors.

It converts the traditional method of placing bids and purchasing goods to e-procurement process.

Functional requirements

User

1. Employees of the organization can able to login the system.
2. System shall allow user/employee to search for available Supplier offering relevant products.
3. System shall able to display required products and service available in market with location of supplier, product details and other necessary information.
4. When user place new bid, system firstly display products from registered supplier.
5. If user wants to know more offer, system will able to display results extracted from other source (like google or any other media).
6. System will be able to score the best vendor (you can compare the vendor offers by comparing product's cost, supply cost and product quality etc.).
7. System shows recommended vendor with all details (location, offer of product and service).
8. Contract management feature. System shall able to create contract quickly using pre-written templets. User can able to select relevant templet and system allows users to perform required changes in the contract.
9. System has feature of e-invoicing as system able to accept supplier's invoice online.

Administration

1. Admin shall be able to add user information
2. Admin shall be able to maintain user information.
3. Admin can add contract templets.

4. Admin can add information of newly registered suppliers in the system, with approval of higher authority.
5. Admin maintain supplier and their offers (products and services) information.

Database required:
Information need to store in database: Users of system, registered supplier, offers of registered suppliers (with product and services).

Tools:
Java, C#, or any relevant tool/language

Supervisor:
Name: Anam Naveed
Email ID: anam.naveed@vu.edu.pk
Skype ID: live:anam13dec

Automatic Question Paper Generator

Project Domain / Category

Web based Application

Abstract/Introduction

In the changing present competitive scenario, Intelligent development of question model is required for intellectual growth of students and to fulfill learning objectives of the course. Although there are several computer-based question paper generators, they typically use random selection from question bank. In this system we present a smart question paper generating system. It is made to allow educational institutes to generate question papers with random but even questions that cover most chapters of subject and have different difficulty levels. After question paper generation student will be able to have it in his/her account and from where student can attempt paper offline and submit from his/her account.

Functional Requirements:

Administrative Functionalities:

Admin Login: Admin would be having a login account. He can add questions in the system and their respective answers. The answers are stored as a base for reference for AI to use while checking answers.

Admin Question Insertion: Administrator to input a set of questions and respective answers for option ticking.

Difficulty Choosing: Administrator will also have to provide weight-age and complexity for each of these questions. After this the questions are stored in the database along with their weight-age. Now at the time of question paper generation admin will select the percentage of difficulty against the number of questions generated in paper.

Random Paper generation: The system now automatically chooses random questions as per the selected difficulty level. On this selection the system selects questions randomly in a way that their total weightage makes total 100 marks for each generated paper with the condition that questions are chosen based on their complexity level.

The questions are also added for various difficulty levels so that as soon admin chooses the type of paper difficulty (Easy, medium, difficult) the system automatically generates paper.

Wide Chapter Coverage: The system will cover as many chapters as specified in the syllabus for that subject.

Doc File Creation: The system now exports the well formatted question paper in a doc file.

Student Functionalities:

Student Registration:

Students will register with the system with studentID, username, password, degree program, email address etc.

Student Login: Student will login in account to check for the paper generated against each course.

Download Paper: Student can download the paper generated for him/her.
Attempt it within timelines and submit the paper.
Grade Book: Student can check his/her grade after it gets marked.

Tools:
This Application uses Asp.net and c#, Python &
SQL database
Reference:

- http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6449828&queryText%3DQuestion+paper+generator+system
- http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6779494&queryText%3DQuestion+paper+generator
- http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=4756830&queryText%3DQuestion+paper+generator+system

Supervisor:

Name: Asma Batool
Email ID: asmabatool@vu.edu.pk
Skype ID: asmabatool13

Driving School Booking Portal

Project Domain / Category

Web based application

Abstract / Introduction

The project involves creating an online booking platform specifically for driving schools. This application facilitate the driving schools and its instructors to register under one platform and fasciculate a common person to choose driving school according to his preference (Particular instructor and location). Driving schools will register in this driving school and allow driving instructors to register under particular deriving school. Developer should get knowledge of driving school operations and familiarity with the specific needs and requirements of the industry would be highly advantageous.

Functional Requirements:

1. The platform will allow users to book driving lessons with their preferred instructors.
2. Profiling component for Driving school, instructor and common user.
3. User will have the option to choose from different driving schools and instructors based on their availability and locations.
4. The platform will also include features such as reviews and ratings, allowing users to share their experiences and help others make informed decisions.
5. User profiles will be available, allowing users to manage their bookings, track their progress and view their past lessons.
6. The ability to integrate reviews, ratings and user profiles into the platform is essential.
7. Driving school have a panel that allow him to approve newly registered instructor

Note: The booking process will be simple and efficient, with clear instructors and options for customization. The platform will prioritize user experience, ensuring a smooth and user friendly interface. Strong communication skills and the ability to understand and implement the client's clear vision for the platform are necessary. Contact with your supervisor to understand the requirements properly.

Technology:
Any web based technology

Supervisor

Name: Faizan Tahir
Email: fazitahir@vu.edu.pk
Skype: faizan.vu

Faculty Portal for Higher Education Institutes (HEIs)

Project Domain / Category
Web Programming

Introduction / Abstract:
Faculty Portal for HEIs is proposed with aim to create a system where students can search faculty information of different universities. Student can search a specific faculty detail by Name, Department, Designation, Qualification, Specialization, Courses and Research interest. As faculty plays key role in any academic institute especially for higher studies, So, this system will help students to select the best institute for higher study based on faculty profile. Merging of faculty information at one place will be helpful for students as they do not have to visit university or individual websites. So, students' effort of searching and comparing faculty of different universities will be reduced.

Functional Requirements:

1. The system should allow students to view different teachers' profiles.
2. The system should allow the teachers of different universities to get them registered on the Portal and upload their CVs/ information.
3. Your faculty portal should include data of at least ten HEC universities.
4. The system should store complete information of Teacher such as their name, designation, experience, email address, office phone number, qualification, specialization, serving institute etc.
5. On home page, faculty profiles should be available institute wise.
6. The system should further allow students to search faculty detail by their Name, Institute, Department, Designation, Qualification, Specialization, and Research interest.
7. Initially, short profile of faculty should be displayed with name, and designation.
8. Clicking on name of any faculty member, users should be directed to another web page containing detailed information of that faculty member, where your web page should contain tabs "**Profile**", "**Publications**", "**Conferences**, **Seminars and Workshops**" and "**Experience**".
9. Add relevant information in Tabs created above.
10. Admin should be able to manage complete portal.
11. Database should be maintained based on given functionality.

Note: More requirements can be added as per need.

Tools:
HTML, CSS, PHP, SQL Server/My SQL

Supervisor:
Name: Umra Naeem
Email ID: umra.naeem@vu.edu.pk
Skype ID: umra.naeem

Intelligent mobile app for Quick Pick-Up Food Order

Project Domain / Category

Mobile Application

Abstract / Introduction

In this digital era, due to busy schedules, and lack of time people don't have stamina to wait, and everyone wants quick service. That's the reason ready-made meals have become the need of people in this age. Because of this habit, at every food point there remains a rush of people all the time. This intelligent alert application will manage all these hazards efficiently by giving online placing food order facility to the customers. After the suggested receiving order time, the customer can collect his/her order. Customers will get their order off the shelf within no time on reaching the restaurant location. Because of its effectiveness the intelligent alert application has become the need of such kind of customers in this digital era. Placing orders online will save the time for a customer who must wait after placing order on the spot-on restaurant location. You need to make an intelligent alert application for Quick pick-up order within no time with the following
requirements.

Functional Requirements:

Some of the functional requirements are.

Restaurant Owner Module

1. Owner registration interface
2. Owner login interface
3. The owner must have a record of food items in the food store.
4. The owner must be notified on placing an order.
5. The owner must be notified about the certain number of food items that are left.
6. The owner must be notified about Food items consumption forecasting on daily basis based on the
selling of the food items.
7. The owner must be notified about the sale at the end of the day on a daily basis.
8. The owner must receive customer complaints.
9. The owner must be notified by the customer suggestions.
10. The owner must be notified of the order cancellation.

Customer Module

1. Customer registration interface
2. Customer login interface
3. Customer order:
4. Place order online
5. Input your order by filling in the food menu form with the following fields.
6. Select food items from the Food items menu with drop down window.
7. Select Price against selected food item.
8. Select mode of payment: Online banking through account, credit card, Cash on receiving
9. Get order slip after paying the food price.
10. A Customer can cancel his or her order within a time frame.
11. A customer can suggest including any new choice of food item.
12. A customer can complain in case of any fault in food quality.
13. Drive to a restaurant location and then pick it up off the shelf.

Tools and language:
Programing language: Java
IDE: Android Studio
Database: SQLite

Supervisor:
Name: Imtiaz Bibi
Email ID: imtiaz.bibi@vu.edu.pk
Skype ID: imtiaz.mavra

MODERN WORK OPPORTUNITY PLATFORM

Project Domain / Category

Web Application

Abstract/Introduction

The proposed project aims to develop a comprehensive and efficient Job Portal System, a user-friendly online platform connecting job seekers and employers. The system will facilitate job seekers in creating profiles, searching for jobs, and applying for relevant positions. Employers will be able to post job vacancies, review applications, and manage their hiring process efficiently. This Job Portal aims to streamline the job search and recruitment process for both candidates and employers.

User Pannel

These tasks will be managed through Secure login and registration for **job seekers** and **employers**. Employers can post, edit, and remove job listings with ease. Job seekers can search and view job details without registration. Advanced search options for job seekers, including keyword search and filters. Job seekers can create and manage their profiles, including personal information, skills, education, and work experience. Employers can create and manage their company profiles, showcasing their mission, values, and job opportunities. Job seekers can apply for jobs with a click, attaching their resumes and cover letters. Employers can view applications, shortlist candidates, and schedule interviews.

Admin Pannel

There will be a separate **Admin Pannel** which will include dashboard for administrators to oversee the platform's activity. It will also enable the administrator to manage users, job listings, and reporting features.

This web application will be developed using PHP as the backend and HTML5, CSS3, JavaScript, Bootstrap for responsive and intuitive user interfaces as frontend.

Database: MYSQL for efficient data storage and retrieval.

Functional Requirements:

1. **Authentication of the User:** The system should provide secure login and registration for job seekers and employers. There should be password recovery mechanisms for forgotten passwords.
2. **Admin Dashboard:** The system should provide a dashboard for administrators to oversee the platform's activity.
3. **Profiles:** Job seekers can create and manage their profiles, including personal information, skills, education, and work experience. Employers can also create and manage their company profiles, showcasing their mission, values, and job opportunities.
4. **Jobs / Job Search Facility:** Employers can post, edit, and remove job listings with ease. Job seekers can search and view job details without registration. Advanced search options for job seekers, including keyword search and filters.
5. **Application Management Dashboard:** Job seekers can apply for jobs with a click, attaching their resumes and cover letters. Employers can view applications, shortlist candidates, and schedule interviews. Automated email notifications for application status updates.

6. **Resume Builder:** Provide a tool for users to create and edit professional resumes directly on the platform.
7. **User Reviews and Ratings**: Allow employers and job seekers to leave reviews and ratings for each other based on their interactions and experiences.
8. **Notifications and Alerts:** Send email or SMS notifications to users for job matches, application status updates, and other relevant activities.
9. **Analytics and Reporting:** Generate reports on user engagement, job posting statistics, and application trends to analyze the platform's performance.
10. **Integration with social media:** Allow users to sign in or share job listings via social media platforms to increase visibility and user engagement.
11. **Feedback Mechanism:** Implement a feedback system in the project to collect user opinions and suggestions for continuous improvement of the platform.

Technologies: PHP, MYSQL, HTML5, CSS3, JavaScript, C#, SQL Server

Supervisor:

Name: Muhammad Qamar Usman
Email ID: qamar@vu.edu.pk
Skype ID: qamarvu

POS for Retail and Sales Management

Project Domain / Category
Web Based Application

Abstract / Introduction
The Point of Sale (POS) system is a web-based application built using Python and the Flask web framework. Its primary purpose is to facilitate sales and inventory management for small to medium-sized businesses. This system allows users to manage products, process sales, generate receipts, and monitor inventory. It's designed to enhance the efficiency and accuracy of sales transactions.

Significance of Study
The study of this POS system is significant because it addresses the following key points:

1. **Efficiency:** The POS system streamlines the sales process, reducing the time required for transactions.
2. **Accuracy:** By automating calculations and inventory management, it minimizes human errors.
3. **Inventory Control:** The system helps businesses keep track of their inventory, reducing overstock or understock situations.
4. **Data Analysis:** The POS system generates reports for sales analysis, helping businesses make informed decisions.

Number of Users
1. Cashiers
2. Managers
3. Administrators

Functional Requirements:
1. **User Authentication:**
   Admins, managers, and cashiers should have unique login credentials.
2. **Product Management:**
   Add, edit, and remove products.
   Categorize products.
3. **Inventory Management:**
   Track product quantities.
   Set alerts for low stock.
4. **Sales Processing:**
   Add items to the cart.
   Calculate the total cost.
5. **Receipt Generation:**
   Generate and print receipts for customers.

Tools:
Python and the Flask web framework

Supervisor:
Name: Saima Jamil
Email ID: saima.jamil@vu.edu.pk
Skype ID: duaa.khan26

RESTful API Based Short Video Sharing Web Application-Link-Tok

Project Domain / Category

Web Programming

In the digital age, social media platforms play an important role in connecting people, sharing experiences, and promoting self-expression.

This project aims to develop a web-based social media platform, titled as "Link-Tok," which will offer its users an opportunity to share photos, videos, and stories with their friends and followers on the website. This key functional requirement of the system will be as follow.

Functional Requirements:

1. **Use of REST API**
    - **a.** The application architecture should be based on RESTful API.

2. **User Registration and Authentication**
    - a. Users will be able to create accounts using their emails.

3. **User Profiles**
    - a. Users will be able to set /edit their profile pictures and provide a short bio.

4. **Posting Content**
    - a. Users will be able to upload photos and videos.
    - b. Add captions, tags, and location information to posts.
    - c. Schedule posts for future publication.
    - d. Edit and delete their posts.

5. **Engagement Features**
    - a. Users can send requests to connect with other users
    - b. Users can disconnect themselves from other users.
    - c. Users can like, comment, and share posts.
    - d. Explore trending and popular posts.

6. **Stories**
    - a. Users can create and share short stories in the form of videos.
    - b. View stories from followed users.

7. **Discover and Search**
    - a. Search for specific users, posts, or locations.

8. **Admin Dashboard**
    - a. Admin can see the report of registered users
    - b. Admin can generate the list of active and inactive users.
    - c. Admin can block any registered user or content.

9. **Analytics**
    a. Video engagement
        i. Time Viewed
        ii. Likes, shares, comments
    b. Video reach
        i. Number of impressions
        ii. Number of views
    c. Video Followers

10. **For You Videos Feature**
    a. On basis of user's interest, the application will show the unwatched short videos to audience.

Tools:
1. PHP and MySQL (You can choose any framework such as Laravel)
2. Bootstrap or any other CSS Framework
3. RESTful APIs Integration using JSON
3. React or any other supporting framework

Supervisor:
Name: Muhammad Saeed Amjad
Email ID: muhammad.saeed@vu.edu.pk
Skype ID: saeed.lro

Skills-Hub

Project Domain / Category

Web Programming

Abstract / Introduction

Web applications are like helpful tools we use on the internet every day. They make it easy for us to find things, use services, and buy stuff online. The Skills-Hub is a web portal that provides users a convenient and easy way to search for electronic-related services online. The platform has an efficient search option that enables users to look up individual skilled workers. If a user needs a skilled person for an electronic job, they will be able to search the portal for electronic services like "computer repair" or "mobile repair", and the portal will find people who can do that. Once a user finds someone suitable for the job, the portal will provide a bunch of information about the worker, such as what they're good at, how much they charge for their work, and even what they've done before. This way, the user will be able to pick the right person for the job.

Functional Requirements:

User Panel

- User can create an account and provide personal information.
- User can update and manage their profile.
- User can search and select a specific skilled worker.
- User can view profiles and ratings of available skilled workers.

Worker Panel

- Skilled workers can register and create profiles, providing details such as their skills, certifications, work history, and availability.

Admin Panel

- Admin has access to a dashboard for managing service requests and skilled workers.
- Admin can add, edit, and activate/deactivate skilled worker profiles.

Tools:

HTML, CSS, JavaScript, jQuery, Bootstrap (Front-end)
MYSQL (phpMyAdmin) Database
PHP (Server-side programming)
XAMPP — Web Application Server

You are advised not to switch the tools. If you do so, you will handle the technical side yourself.

Note:

- These are the basic requirements of the application. Students may add further functionalities to make the application more useful.
- Virtual University of Pakistan (VU) will not provide any kind of hardware for this project; a student has to arrange the required hardware by himself/herself.
- VU will not pay for any license of the software, the libraries /toolkits/APIs used in this project.

Supervisor

Name: Musaddiq Hussain
Email ID: musaddiq.hussain@vu.edu.pk
Skype ID: kashaan.ali13

Smart Stock Stealing Prevention POS for Restaurant

Project Domain / Category

Web Based Application

Abstract / Introduction

Every restaurant and food chain needs smart way to manage their sales and stock. The need of hour is to calculate stock consumption with the sale orders on runtime. So, this smart POS system is based on the same idea.

This smart POS system helps restaurants owners to manage their stock (Raw food items) consumption to be used as ingredients into the cooked food they sell. System will synchronize the stock consumption with sale screen. The more a food items will be sold the more stock related to that food item will be minus from the stock.

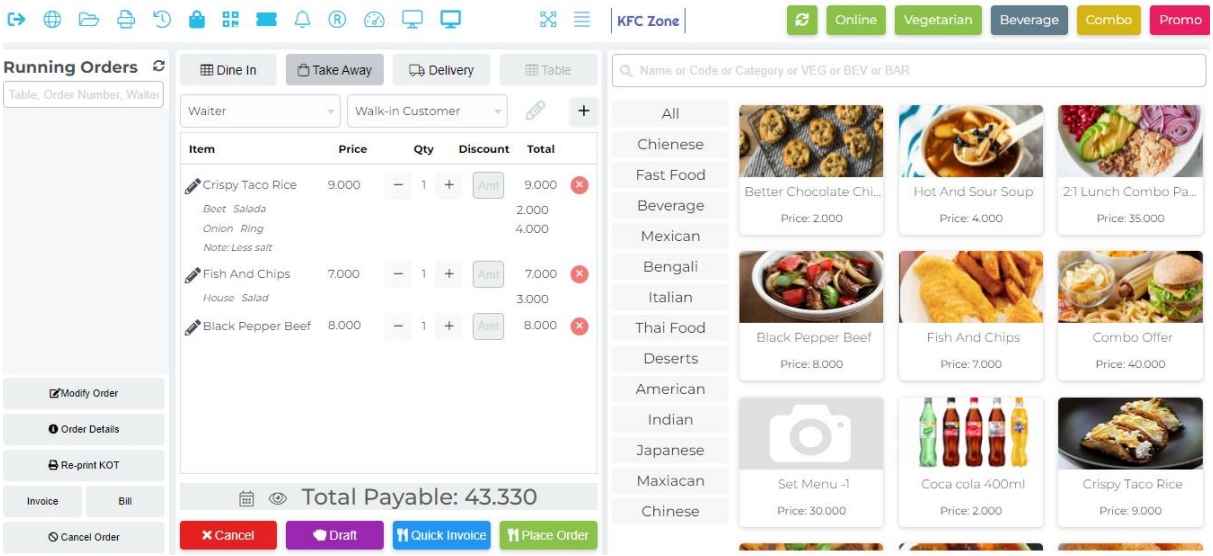
There will be a complete recipe management form in the system to estimate how much ingredients are used in preparation of one food item. This system will help restaurants owners to verify their stock consumed and stock purchased and stop stock waste and stealing.

Functional Requirements:

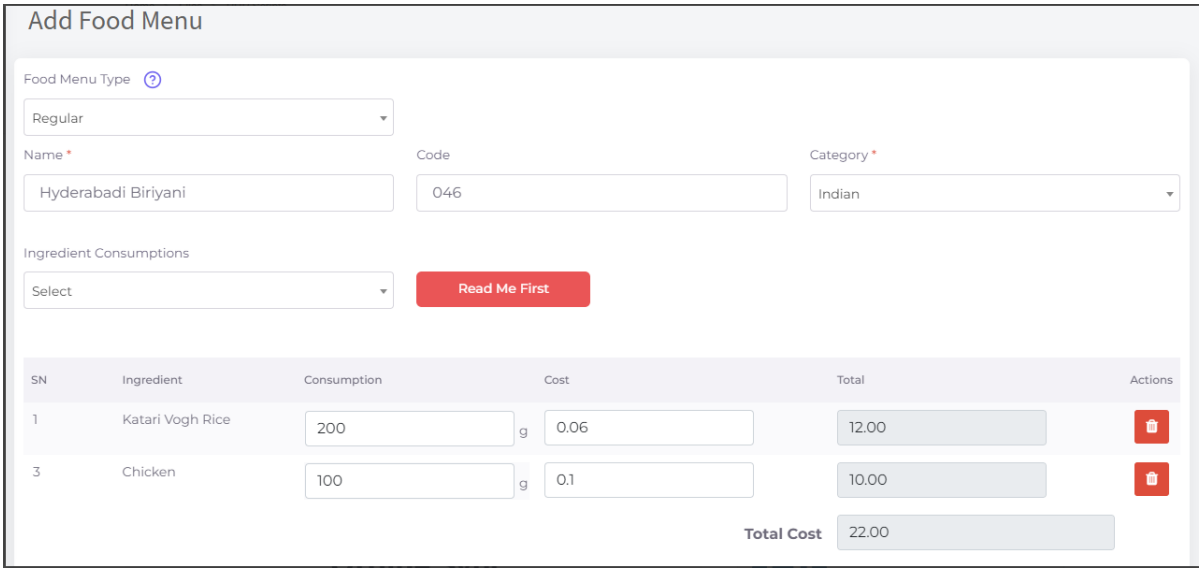
1. Admin should maintain stock entry received from supplier using the stock entry form for the food items to be used as ingredients in the recipe of Food menu items.
2. User should Make Recipe for Food, and when make a Sale, Stock should be Auto Deducted.
3. System should generate Table QR Code, Customer sitting in the Dine-in Area should Scans by Phone, Choose Food & Order.
4. Cashier should be able to Accept/Decline the order placed by customer
5. Customer should be able to add New Food by Himself in the order.
6. Cashier should be able to add New Item to Running Order.
7. Real Time Order List, Close Only When Customer Completes Eating, Add New Item to an Order, KOT Print for Only New Item.
8. Table Management, Area Wise Table Management., and Table Selection for Dine In, Table Time Tracking, and Restrict table selection on ongoing table, Order without Table (For standing customers).
9. System should have category wise Multi Kitchen, Kitchen Screen for Chef, Tab Supported (1280x800), and Order Ready Notification in POS.
10. If the Internet is gone suddenly? No Worry! The POS software should still run and sync orders data online when internet is available.

Sample Screen Shots for POS:

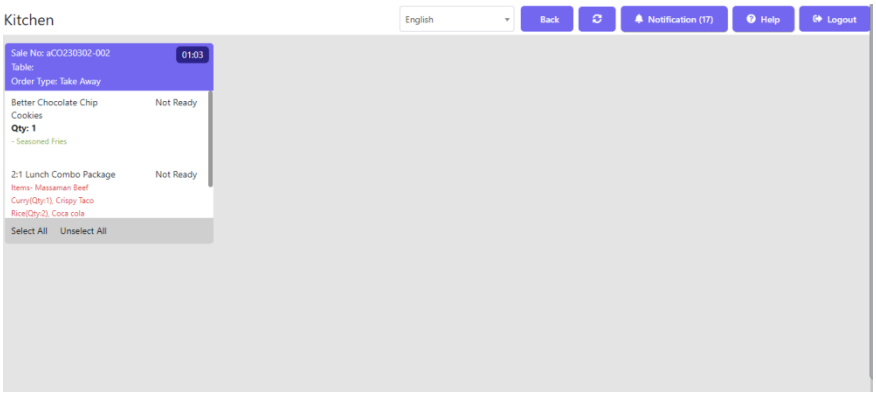
Order Screen:

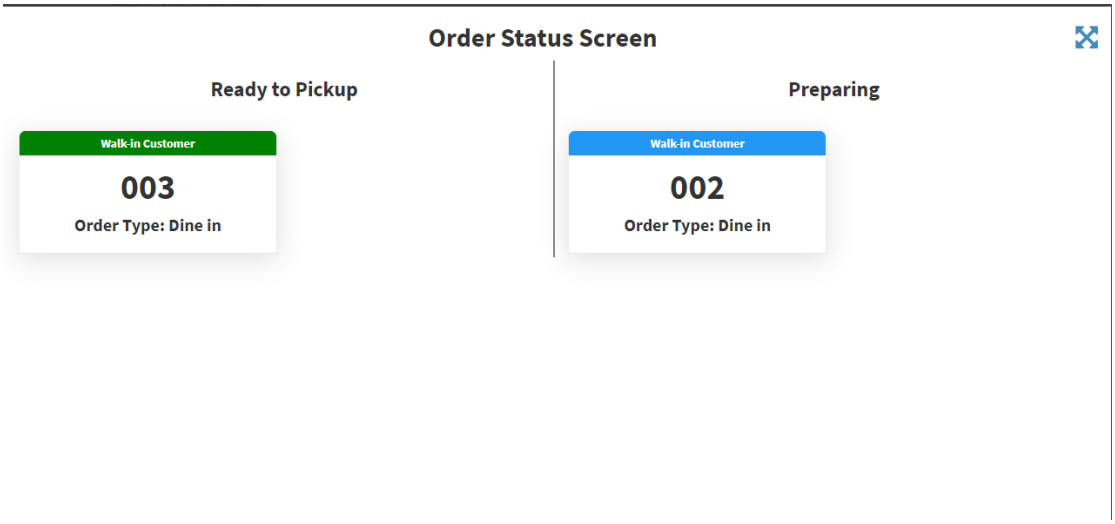


Add Food Menu (for tracking Stock Consumption):



Kitchen Order Status Screen:





Tools:

Use Any Web Development Technology like PHP, Java, ASP.NET, PWA etc.

Supervisor:

Name: Shakeel Saeed
Email ID: shakeel@vu.edu.pk
Skype ID: shakeelsaeedvurnd
Skype Profile Link: https://join.skype.com/invite/yIuFlFa5L1Pc

Time Table Automation System

Project Domain / Category

Web programming

Abstract / Introduction

Time Table Automation System for your educational institute is designed to streamline the process of creating and managing class schedules, making it more efficient and error-free. With this system, you can easily manage class timings, room allocations, and faculty assignments while ensuring that all stakeholders have real-time access to the latest schedules.

Primary objectives of the Time Table Automation System are to automate the process of creating, managing, and updating class schedules, thus reducing time and effort required for manual scheduling. Also, minimize scheduling conflicts and errors in room allocations, faculty assignments, and class timings.

Web-based platform that is accessible to administrators, faculty, and students, enabling them to view and receive updates on class schedules.

Functional Requirements:

The system will be used by three modules, which are Administrators, Faculty, and Students Each module is interconnected or integrated to each other. This system is very easy to understand and user friendly. In this system user can connect any time whenever he/she wants. This system should be secured.

1. User Interface: A user-friendly web-based interface that allows authorized users (administrators, faculty, and students) to access and interact with the system.
2. Admin Dashboard: A centralized dashboard for administrators to set constraints, input data, and generate schedules.
3. Database: A database to store information about courses, faculties, students, rooms, and scheduling constraints.
4. Scheduling Algorithm: A robust scheduling algorithm that takes into account various constraints and preferences to generate class schedules.
5. Notifications: An integrated notification system to inform users of any changes in schedules or important updates.
6. Reporting and Analytics: Tools for generating reports and analytics to aid in decision-making and resource optimization.
7. User Roles: Different levels of access and permissions for administrators, faculty, and students.
8. Constraint Management: Ability to define constraints such as room availability, faculty preferences, and student preferences.
9. Automated Scheduling: An intelligent algorithm to generate class schedules based on defined constraints.
10. Real-time Updates: Immediate notification of any schedule changes or updates to all stakeholders.

11. Conflict Resolution: Automated conflict resolution for cases where constraints cannot be met.
12. Report Generation: Customizable reports and analytics for better decision-making.
13. Support and Maintenance: Ongoing support and maintenance to address any issues or updates.

Tools:

ASP.NET/C#, HTML, CSS, JavaScript, Crystal report, SQL Server,

Supervisor:

Name:qaisershabbir
Email ID: qaiser.shabbir@vu.edu.pk
Skype ID:qaiser_shabir

Tutor Finder

Project Domain / Category

Web Programming

Abstract / Introduction

The Tutor Finder application is a versatile platform, designed to assist students and parents in locating educators nearby. This system empowers teachers to enroll in the platform via a user-friendly web interface. Teachers can input their profile details, professional background, and areas of expertise.

For students and parents, the application offers a convenient search feature to find tutors for specific courses or topics of interest. Its primary function revolves around gathering valuable feedback from students and parents about the tutors. This feedback can be in the form of written comments and ratings. Parents can make informed decisions about selecting a tutor based on this feedback.

Additionally, the application can integrate topic-specific expertise and feedback to provide even more tailored information. Students and teachers can also schedule tutoring sessions according to the available time slots, making it a comprehensive solution for education seekers.

Functional Requirements:

1. **User Registration and Authentication:**
   - Users should be able to create accounts with their personal information.
   - Users should be able to log in securely.
2. **User Profiles:**
   - Users can create and manage their profiles, including personal details, education, and subjects they want to teach or learn.
   - Users can upload a profile picture.
3. **Search and Matching:**
   - Users can search for tutors based on various criteria such as subject, location, availability, price, and rating.
4. **Tutor Listings:**
   - Tutors can create listings that include information about the subjects they teach, their qualifications, rates, availability, and location.
5. **Reviews and Ratings:**
   - Users can leave reviews and ratings for tutors.
6. **Scheduling and Booking:**
   - Users can schedule sessions with tutors.
7. **Admin Panel:**
   - Administrators should have access to an admin panel for managing users.
8. **User Dashboard:**
   - Provide a user-friendly dashboard where users can manage their activities, appointments, and settings.

Tools:

HTML, CSS, JavaScript, jQuery, Bootstrap (Front-end)
MYSQL (phpMyAdmin) Database
PHP (Server-side programming)
XAMPP — Web Application Server

You are advised not to switch the tools. If you do so, you will handle the technical side yourself.

Note:

- These are the basic requirements of the application. Students may add further functionalities to make the application more useful.
- Virtual University of Pakistan (VU) will not provide any kind of hardware for this project; a student has to arrange the required hardware by himself/herself.
- VU will not pay for any license of the software, the libraries /toolkits/APIs used in this project.

Supervisor:

Name: Ehsan ul Haq
Email ID: Ehsan.haq@vu.edu.pk
Skype ID: Ehsan_mtn

Warehouse Management System

Project Domain / Category

Web Application

Abstract / Introduction

ABC is a company which is running a large-scale business across Lahore, Karachi, Rawalpindi, Faisalabad, and Quetta in Pakistan. Its head office is in Rawalpindi. After manufacturing the finished products, they are sent to the warehouse located in Rawalpindi. All finished goods are dispatched to all distribution centers through the warehouse.

You are required to develop a Warehouse management system for this company. You need to maintain records of all incoming and outgoing products. Firstly, you are required to develop a chart of accounts (parent accounts, control accounts, and ledger accounts). Furthermore, you are required to generate different reports that help ABC Company in decision making, such as inventory reports, stock aging, stock value reports, and stock movement reports.

Functional Requirements:

1. Admin will log in to the system using their login ID and password.
2. Admin can create users and give rights to other users.
3. Admin can use the entire system to enter, update, and delete any record.
4. Admin can manage a chart of accounts (parent accounts, control accounts, and ledger accounts).
5. Admin can generate a detailed report to view item-wise, day-wise, week-wise, or month-wise details of items coming in and out of the stock, and brand-wise details of items coming in and out.
6. Only Registered users will be able to login to the system.
7. User can also enter, update, and delete if the admin grants them complete rights.
8. User can enter data into the system, such as creating vouchers and reviewing ledgers.
9. User can view a report of all items in the warehouse by city.
10. User can generate different reports such as inventory reports, stock aging, stock value reports, and stock movement reports.

Tools:

Developer can develop this project in any web based tool. For example, HTML, CSS, JavaScript, PHP, .net, MySQL etc.

Supervisor:

Name: Muhammad Kamran Qureshi
Email ID: kamran.qureshi@vu.edu.pk
Skype ID: kamranqureshi99

Web-based Chat bot

Project Domain / Category

Web Programming

Abstract / Introduction

A web-based Chat bot is a computer software that simulates natural human speech and interacts with users via the internet. It answers questions from users and offers guidance or support, acting as a virtual assistant. Customer service, e-commerce, and information retrieval are just a few of the uses for these chat bots, which can be included in websites, messaging services, or mobile apps. Natural language processing (NLP) and machine learning are two technologies that web-based chat bots employ to comprehend and interpret user input. This allows for dynamic and interactive discussions. Enhancing user experiences, streamlining communication, and automating repetitive chores are the main objectives of a web-based Chat bot, which will eventually increase productivity and engagement in online settings. In Chat bot, the users will type messages or use voice recognition to communicate with the Chat bot. The interface displays the Chabot's responses in a conversational format, showing both the user's messages and the Chabot's replies. This message history provides context for the conversation. Chat bot interface will include features for user engagement, such as emojis, stickers, or interactive elements, to make the interaction more enjoyable and expressive. A typing indicator will show when the chatbot is processing a response, indicating to the user that the chat bot is active. Users will attach files, images, or other media in their messages, and the interface should support the display and handling of these attachments. Interfaces often include quick reply buttons or options for users to select from, simplifying the interaction process and guiding users to specific actions or responses.

Functional Requirements:

1. The chat bot interface must support both text-based and voice-based input from users.
2. The interface should display the chat bot's responses and user messages in a conversational format, maintaining a message history for context.
3. The chat bot interface must provide features for user engagement, including emojis, stickers, and interactive elements to enhance the user experience
4. A typing indicator feature is required to notify users when the chat bot is processing a response, indicating that the chat bot is active and working on their request.
5. The chat bot interface should include quick reply buttons or options that allow users to select from predefined choices, simplifying interactions and guiding users to specific actions or responses.

Tools:

- HTML, CSS, and JavaScript
- MYSQL
- Node.js
- Natural Language Toolkit (NLTK), spaCy, or the Google Cloud Natural Language API
- Web Speech API for voice recognition and synthesis

Supervisor:

Name: Kainat Malik
Email ID: kainat.malik@vu.edu.pk
Skype ID: live:.cid.3b1f7ceb7839e941

Enhancing Learning Management System (LMS) User Experience: A Human-Computer Interaction (HCI) Undergraduate Project

Objective: To improve the user experience (UX) of a Learning Management System (LMS) by applying HCI principles and redesigning the interface for increased usability and learner satisfaction.

Project Components:

SRS

1. **Literature Review:**
    - Review HCI principles relevant to LMS design.
    - Explore existing research on UX design for educational platforms and identify effective strategies.
2. **Identification of LMS:**
    - Choose an existing LMS for an in-house educational platform used by the institution.
3. **User Persona Development:**
    - Create user personas representing students, instructors, and administrators, considering their specific needs, goals, and technological proficiency.

Design

4. **Design Prototyping:**
    - Use prototyping tools to create low-fidelity wireframes and high-fidelity mockups, ensuring a user-friendly and intuitive design.
    - Apply HCI principles such as information architecture, feedback, and task efficiency in the design.
5. **Usability Testing:**
    - Conduct usability testing with representative users to gather feedback on the initial design.
    - Evaluate aspects such as ease of navigation, clarity of course materials, and overall user satisfaction.
6. **Iterative Design:**
    - Apply feedback from usability testing to iterate on the design, adjusting enhance usability and address user concerns.
7. **Accessibility Considerations:**
    - Ensure the LMS is accessible to users with diverse abilities by incorporating features such as screen reader compatibility and clear navigation.

Implementation:

- Implement the final design, incorporating interactive elements that enhance engagement and facilitate a positive learning experience.
- Ensure that the user interface aligns with HCI principles and best practices.

8. **User Training Module:**
    - Develop a user training module within the LMS to guide users through its features, promoting a smooth onboarding process.
9. **Evaluation Metrics:**
    - Define metrics for evaluating the success of the redesigned LMS, including user engagement, course completion rates, and user satisfaction scores.

10. **User Feedback Surveys:**
    - Administer post-implementation surveys to gather user feedback on the LMS's usability and overall user experience.

Documentation and Reporting:

- Prepare comprehensive documentation detailing the design and implementation process.
- Present findings and recommendations for further enhancements in a final project report.

Expected Outcomes:

- A redesigned Learning Management System with improved user interface and enhanced usability.
- Insights into the practical application of HCI principles in the context of educational technology.
- User feedback data and recommendations for future improvements.

Benefits:

- Practical application of HCI concepts in an educational context.
- Development of user interface design skills specific to learning platforms.
- Contribution to the improvement of educational technology, promoting a positive impact on the learning experience for students, instructors, and administrators.

Supervisor

Dr. Muhammad Salman Bashir
Skype id: Muhammad.salman.bashir
Email id: salmanbashir@vu.edu.pk