A TECHNICAL REPORT ON STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES).

2023-2024 ACADEMIC SESSION.

AT

KWARA STATE SCIENCE AND TECHNOLOGY INNOVATION HUB.

BY

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DEDICATION.

I dedicate this report to my parents, siblings, and mentors for their unwavering support and guidance throughout my academic journey. Their encouragement and belief in my abilities have been my driving force and constant motivation. I extend my heartfelt gratitude. And to almighty ALLAH for keeping me through this internship .

Acknowledgements

I am profoundly grateful to the Kwara State Innovation Hub for providing me with the opportunity to participate in their training program. My sincere appreciation goes to my Director,[Mr. Temi Kolawole], and supervisor, **[MRS Alajiki Temiloluwa]**, for their invaluable guidance and mentorship throughout the SIWES period. Special thanks to the trainers at the Innovation Hub for their patience and insightful teaching. Lastly, I am grateful to my family, friends, and colleagues for their support and motivation during this training, May Almighty ALLAH continue to bless and protect them all AMEN.

ABSTRACT.

This SIWES report provides a detailed account of my three-month industrial training at the Kwara State Innovation Hub, where I learned data analysis and data science as a beginner. The training introduced me to tools such as Google Colab, Python, and IBM Watson studio for data manipulation, visualization, and exploration. I gained practical experience through hands-on projects, including data cleaning, exploratory data analysis, and basic predictive modeling. The challenges encountered, such as understanding advanced algorithms and coding syntax, were addressed through mentorship and online resources. This experience has reinforced my interest in data science, and I look forward to expanding my knowledge in future training opportunities. this abstract explores the importance of SIWES in developing student's skills, encouraging industry academic collaboration, and preparing students for the workforce., illustrating the real-world application of skills acquired during the internship. Challenges faced and lessons learned are explored, emphasizing the role of adaptability and creative problem-solving. The report concludes with recommendations to enhance future intern experiences and a reflection on the enduring impact of this internship on personal and professional growth. This SIWES Experience at kwara state innovation hub serves as a testament to the seamless synergy of academic knowledge and practical experience, fostering a more versatile and capable professional in the field of Data science as a Whole.

TABLE OF CONTENT.

CHAPTER ONE.

1.1 INTRODUCTION

Student Industrial Work Experience Scheme (SIWES) is a skill training programme designed to prepare university and tertiary institution students for real-world experience, on the job work experience and industrial work situations they may encounter after graduation.

1.2 STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES) BACKGROUND

In 1973, the Industrial Training Fund (ITF), a government organization tasked with fostering and fostering the development of human resources for companies, founded the student industrial work experience scheme (SIWES) in Nigeria. The scheme was implemented because of the realization that there was a substantial gap between the actual skills needed by industry and the academic information acquired in higher institution.

To enhance the student's practical skills, knowledge of the industry, and general employability, the main objective of SIWES was to provide students the opportunity to apply their academic understanding in the real-world work environment. The programme gave students the opportunity to get practical experience while being supervised by experts in their respective professions, with the goals of bridging the gap between academic and industry.

In summary, SIWES was formed in response to the need for students to acquire practical skills and experience in addition to their education. The program aimed to foster collaboration between academic and industry to better prepare students for the workforce and promote the growth of various sectors within the Nigerian economy

1.3 OBJECTIVE OF SIWES

The objective of the Student Industrial Work Experience Scheme (SIWES) is to provide Nigerian students in tertiary institutions with practical exposure and experience in their chosen fields of study. SIWES is a program in Nigeria that was established to bridge the gap between theoretical knowledge acquired in the classroom and practical skills required in the workplace.

1. BODIES INVOLVED IN THE MANAGENMENT OF SIWES

The management of Student industrial work experience scheme (SIWES) involves different several bodies which includes:

- The Industry Training Fund (ITF)
- National Universities Commission (NUC)
- National Board for Technical Education (NBTE)
- National Commission for Colleges of Education (NCCE)
- Institutions of Higher Learning
- The Employers of Labor

1.5 CONCLUSION

Through this SIWES program, I have learned to more, gained more understanding about my field of study, being able to solve problems, interact with students from my institution and student from different institution and share practical knowledge and understanding with them.

BACKGROUND OF COMPANY/ORGANIZATION.

2.1. INTRODUCTION

The Kwara State Science and Technology Innovation Hub, often referred to as the Ilorin Innovation Hub, is a strategic initiative by the Kwara State Government aimed at fostering technological advancement, innovation, and entrepreneurship in the state.

2.2 BACKGROUND AND VISION:

The Innovation Hub was conceived as part of Governor AbdulRahman AbdulRazaq's administration's broader agenda to transform Kwara into a Technological, economically viable and self-sustaining state. The vision includes leveraging technology, digital literacy, and innovation to empower the youth and drive economic development. The hub is a response to the growing need for digital skills and entrepreneurship among young people aged 18–35 in the state.

2.3 DEVELOPMENT AND PARTNERSHIP:

The hub was initiated through a public-private partnership. In November 2023, the Kwara State Government signed a Memorandum of Understanding (MoU) with HIS Nigeria, a telecommunications infrastructure company, to provide financial and technical support for the hub's completion. HIS Nigeria committed to managing the facility and delivering various digital training and startup accelerator programs.

The project is part of a broader effort to align technology with entrepreneurship and investment. It focuses on creating a conducive environment for tech talent and startups to thrive, with facilities such as coworking spaces, office setups, training facilities, and hardware support, with people in wild range of field to help setup individuals.

2.4. **Objectives of Kwara State Innovation Hub**

The **Kwara State Innovation Hub** is a government-led initiative aimed at fostering innovation, technological advancement, and entrepreneurship in Kwara State, Nigeria. Below is an outline of its **objectives** and a proposed structure for its **organizational chart**.

2. **Promote Technological Skills Development**
    - Offer training programs in areas like software development, data analysis, artificial intelligence, and other emerging technologies.
3. **Support Entrepreneurship and Startups**
    - Provide resources, mentorship, and funding opportunities to help startups grow and scale their businesses.
4. **Drive Digital Inclusion**
    - Bridge the digital divide by offering access to digital tools, training, and internet services for underprivileged communities.
5. **Foster Research and Innovation**
    - Collaborate with academic institutions and industry stakeholders to drive research and innovative solutions to societal challenges.
6. **Create Employment Opportunities**
    - Enable job creation through skill development, business incubation, and partnerships with industries.
7. **Enhance Government Services Through Technology**
    - Support e-governance initiatives and digital transformation across state agencies.

2.5 Proposed Organizational Chart

1. Board of Directors

- Oversees overall strategy, vision, and alignment with state goals.
- Members: Governor (Chairperson), Commissioners (Education, Technology, etc.), Private Sector Leaders.

2. Executive Leadership

- **Executive Director/CEO**
  - Leads the Hub, sets strategic objectives, and oversees operations.
- **Chief Operating Officer (COO)**
  - Handles day-to-day management and operational planning.

3. Core Departments

- **Training and Capacity Building**
  - Develops and manages training programs, workshops, and certifications.
- **Innovation and Research**
  - Focuses on identifying innovative solutions and partnerships for tech research.
- **Business Development and Partnerships**
  - Builds relationships with private sectors, startups, and funding agencies.
- **ICT Infrastructure Management**
  - Ensures availability and maintenance of technological tools and infrastructure.
- **Marketing and Public Relations**
  - Promotes the Hub's activities, manages its public image, and attracts participants.
- **Finance and Administration**
  - Manages financial resources, budgets, and administrative tasks.

4. Advisory Committees

- Groups of experts providing insights in specific areas such as education, technology, and business development.

5. Incubation and Startup Support Unit

- Provides hands-on support to entrepreneurs, including mentorship, workspace, and funding.

8. Monitoring and Evaluation (M&E)

- Tracks the performance and impact of the Hub's programs.

This structure ensures smooth operations, fosters partnerships, and meets the goals of driving innovation and technology adoption in Kwara State.

CHAPTER TWO.

THE PROCESS,COMPONENTS &DESCRIPTION.

3.1. INTRODUCTION

The Student Industrial Work Experience Scheme (SIWES) is a vital program designed to provide students with practical exposure and hands-on experience in their chosen fields of study. My placement at the **Kwara State Innovation Hub** offered me an exciting opportunity to begin my journey into the world of **data science**, a field that combines mathematics, programming, and domain expertise to extract meaningful insights from data.

As a beginner in data science, my experience was tailored to introduce me to foundational concepts, tools, and methodologies while integrating me into a professional, innovation-driven environment. The Kwara State Innovation Hub, known for fostering technological growth and empowering young talent, provided the ideal setting for me to learn, grow, and apply data science principles in real-world scenarios.

CORE VALUES:

1. Innovation
    - Encouraging creative thinking and groundbreaking ideas to solve societal challenges and drive progress.
2. Collaboration
    - Building strong partnerships with government, academia, private sector, and communities to achieve common goals.
3. Inclusivity
    - Ensuring that everyone, regardless of background or socio-economic status, has access to opportunities and resources.

4. Excellence
    - Striving for the highest standards in delivering programs, training, and solutions.
5. Sustainability
    - Promoting sustainable practices in technology and innovation to ensure long-term impact.
6. Empowerment
    - Equipping individuals and businesses with the skills, tools, and resources to thrive in a digital economy.
7. Integrity
    - Upholding transparency, accountability, and ethical practices in all operations.
8. Resilience
    - Adapting to technological changes and challenges with agility and determination.
9. Community Impact
    - Focusing on initiatives that directly improve the lives of residents and contribute to the development of Kwara State.
10. Continuous Learning
    - Fostering a culture of lifelong learning to stay at the forefront of global technological trends.

These values guide the Hub's approach to achieving its vision of transforming Kwara State into a hub for innovation and technological excellence.

3.2 DETAIL OF SIWES WORK EXPERIENCE:

The Process of My SIWES Experience:

1. **Orientation and Onboarding**
    - A comprehensive introduction to the Hub's mission, vision, and core activities.

- Overview of the **Data Science Unit**, including its objectives, ongoing projects, and tools used, where they assign a supervisor to me.

2. **Skill Development Workshops**
    - Attended beginner-friendly workshops on **data analysis, visualization**, and **Python programming**.
    - Training in data science tools such as Excel, Jupyter NotebooK, Google Colab, Pandas, and IBM WATSON STUDIO.
3. **Practical Assignments**
    - Hands-on tasks involving data cleaning, processing, and visualization using sample datasets.
    - Weekly progress reviews to ensure alignment with learning goals.
4. **Team Collaboration**
    - Worked alongside experienced data scientists on minor tasks such as preparing datasets and creating simple visualizations.
    - Participated in team discussions and brainstorming sessions on how data science can solve real-world problems.
5. **Project Involvement**
    - Assigned a beginner-level project: Analyzing and visualizing a small dataset to provide actionable insights.
6. **Feedback and Evaluation**
    - Regular feedback sessions to assess my progress and provide constructive guidance.

Key Components of My Work Experience

1. **Technical Learning**
    - Acquired foundational knowledge of programming in Python, specifically libraries such as **Pandas** for data manipulation and **Matplotlib**for visualization.

    - Learned basic statistical techniques and how they are applied in data science.

2. **Soft Skills Development**
    - Improved my problem-solving, communication, and teamwork abilities.
    - Developed time management skills by adhering to deadlines for assignments and tasks.
3. **Practical Application**
    - Gained exposure to the practical aspects of data science, including working with real-world datasets and addressing challenges like missing data and inconsistent entries.
4. **Exposure to Tools and Platforms**
    - Familiarity with **Google Colab**, a vital tool for creating and sharing documents that contain live code, equations, visualizations, and text.
5. **Networking and Mentorship**
    - Built connections with industry professionals and peers.
    - Received mentorship from senior data scientists and IT experts.

Description of My Role as a Beginner in Data Science

As a beginner, my primary role was to **observe, learn, and practice** under the guidance of experienced mentors. I was tasked with:

- Understanding the basics of data science and its applications.
- Performing beginner-level data preprocessing and exploratory data analysis (EDA).
- Creating simple visualizations to communicate insights effectively.
- Assisting with documentation and reporting for ongoing projects.

This experience helped me build a strong foundation in data science and motivated me to further explore this dynamic field.

3.3 PROJECT CARRIED OUT:

On the other hand, this chapter contains an extremely thorough list of the most noteworthy projects that I took part in while at kwara state innovation hub. By working on these projects, I am building up and sharpening a lot of different set of skills; they covered quite various area from beginning programming and basic syntax and programming steps in python programming language.

1.**Python programming (Beginners):**

I underwent an intensive 4 weeks training mainly on python beginning, since I had no previous knowledge on the programming language. It was intended as the training had aimed at providing a comprehensive understanding of basic python that includes most things ranging from syntax through data structure to functionalities and object oriented programming.

Week 1: Python Fundamentals

During my first week in this programming course, I immersed myself in the basics of Python. Introduction of concepts like variables, data types, operators, and fundamental control structures. During this stage, an effective grasp was acquired on the syntax and architecture of Python.

Week 2:Functions and Modules

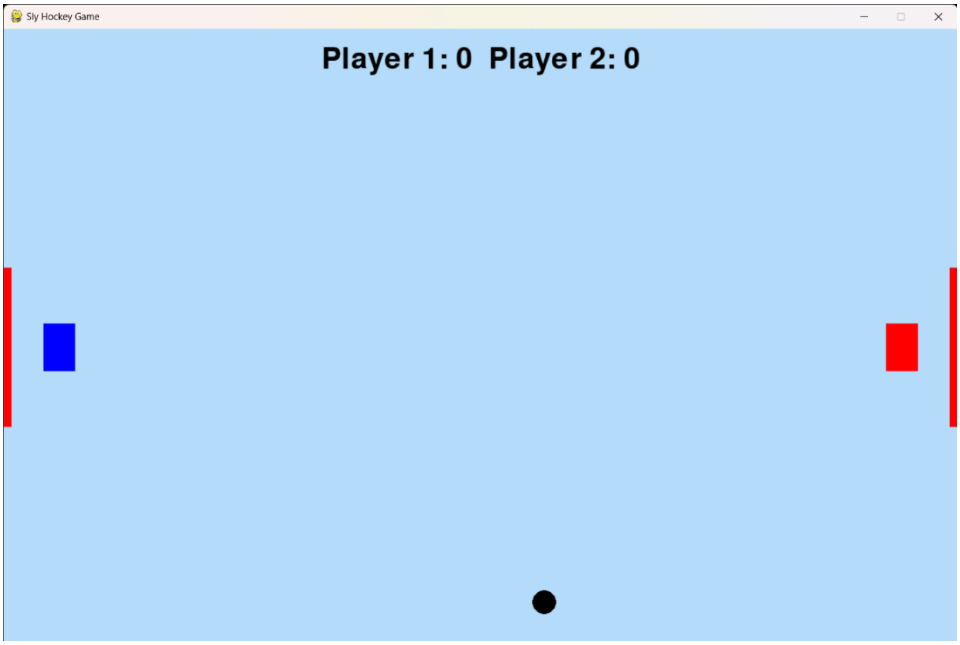
I ventured into the world of functions and modules in Python during my second week. Functionality opened a whole new world for me as I learnt how to create reusable code slivers and started exploring python's massive library of modules. Functions and modules provided fresh approaches to organizing codes and rendering them efficient.

Week 3:OOP Data Structure and Objective Objects.

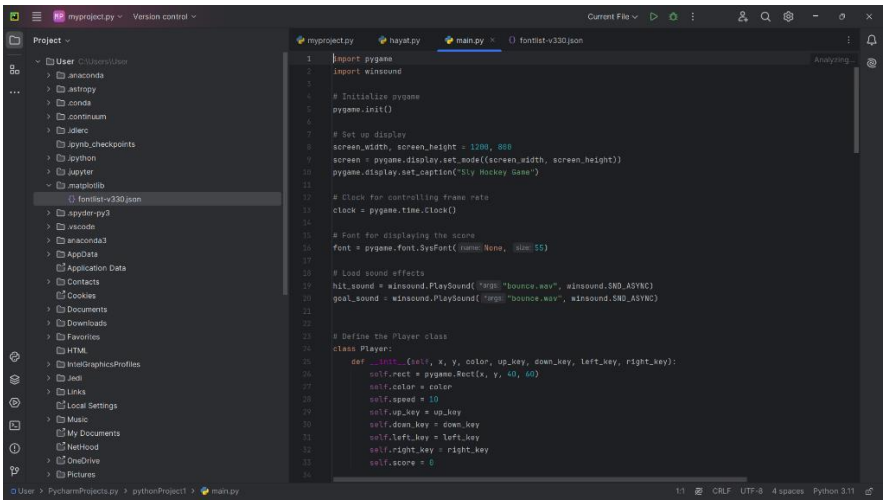
In the third week, I moved on to data structure such as lists, dictionaries, tuples and data sets.Learnt how to use pygame library in building little games demo. Moreover, this study taught me to use OOP, which allowed me to write a cleaner and well-organized code for my classes and objects,

making it easier to follow and debug at later stages. This knowledge helped me in constructing my project.

Week 4: Part of the task-on project I undertook while at the kwara state innovation hub was to build a windows platform game with the help of my supervisor and colleague at work which only runs on a windows computer. The game is a 2-D game of sky hockey.



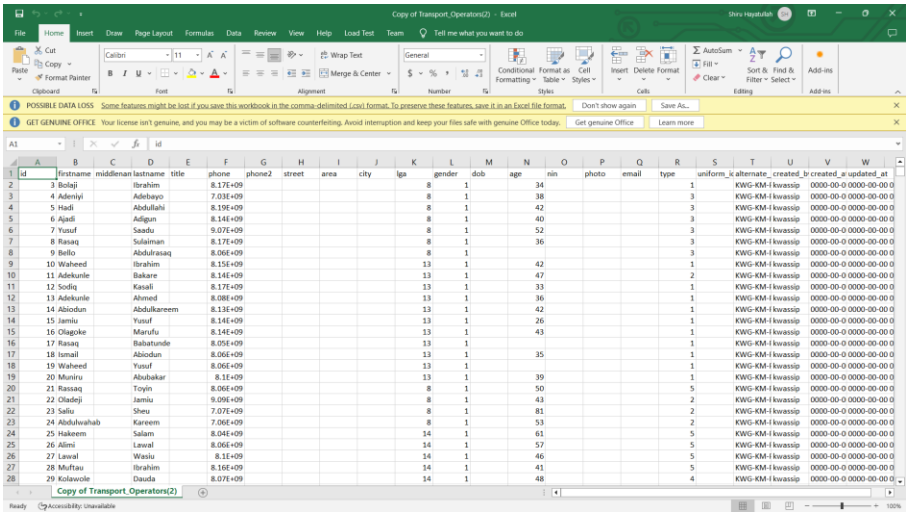
This is the front view or front end of the python generated game.



This are evidence of code been run to make the game.

2.Data Refining and Cleaning(on Excel):

Using Microsoft Excel and IBM Watson Studio, I learned to clean and refine datasets by removing duplicates, handling missing values, and standardizing formats and learning to identify necessary set that is essential for a dataset.



id	firstname	middlenan	lastname	title	phone	phone2	street	area	city	lga	gender	dob	age	nin	photo	email	type	uniform_ic	alternate_	created_b	created_a	updated_at
3	Bolaji		Ibrahim		8.17E+09					8	1		34				1			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
4	Adeniyi		Adebayo		7.03E+09					8	1		38				3			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
5	Hadi		Abdullahi		8.19E+09					8	1		42				3			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
6	Ajadi		Adigun		8.14E+09					8	1		40				3			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
7	Yusuf		Saadu		9.07E+09					8	1		52				3			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
8	Rasaq		Sulaiman		8.17E+09					8	1		36				3			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
9	Bello		Abdulrasaq		8.06E+09					8	1						3			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
10	Waheed		Ibrahim		8.15E+09					13	1		42				1			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
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13	Adekunle		Ahmed		8.08E+09					13	1		36				1			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
14	Abiodun		Abdulkareem		8.13E+09					13	1		42				1			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
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16	Olagoke		Marufu		8.14E+09					13	1		43				1			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
17	Rasaq		Babatunde		8.05E+09					13	1						1			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
18	Ismail		Abiodun		8.06E+09					13	1		35				1			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
19	Waheed		Yusuf		8.06E+09					13	1						1			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
20	Muniru		Abubakar		8.1E+09					13	1		39				1			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
21	Rasaq		Toyin		8.06E+09					8	1		50				5			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
22	Oladeji		Jamiu		9.09E+09					8	1		43				2			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
23	Saliu		Sheu		7.07E+09					8	1		81				2			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
24	Abdulwahab		Kareem		7.06E+09					8	1		53				2			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
25	Hakeem		Salam		8.04E+09					14	1		61				5			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
26	Alimi		Lawal		8.06E+09					14	1		57				5			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
27	Lawal		Wasiu		8.1E+09					14	1		46				5			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0
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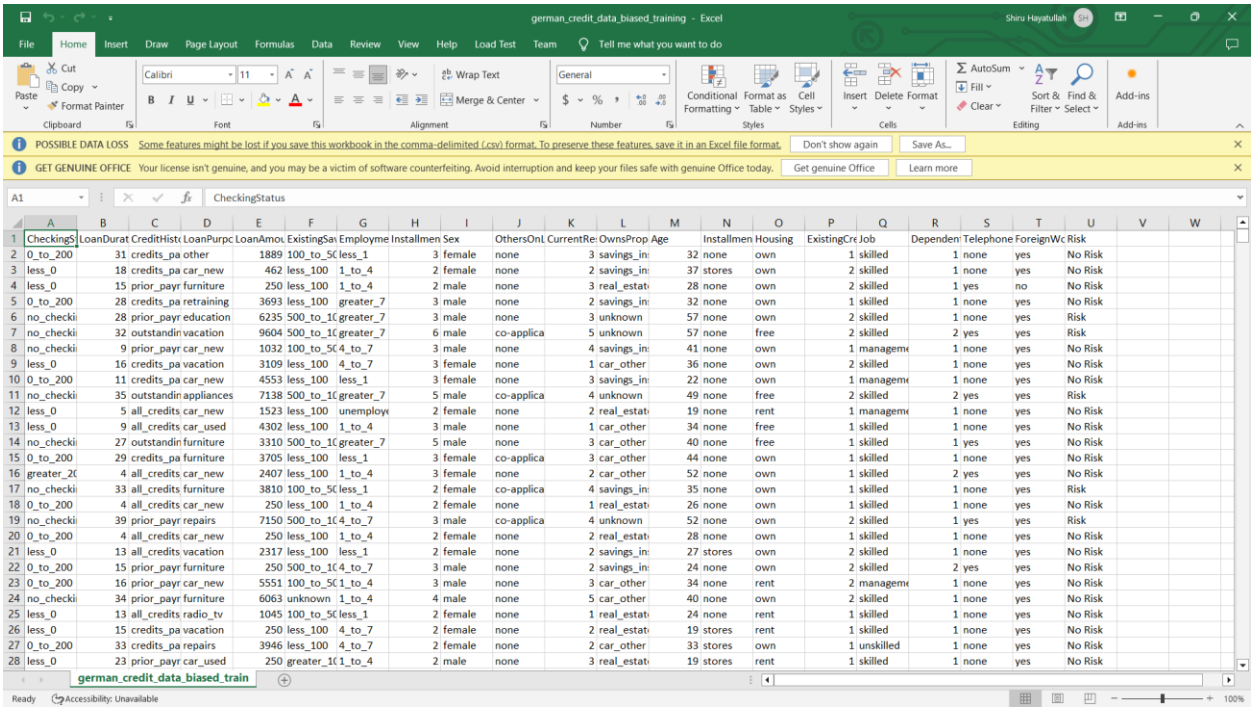
29	Kolawole		Dauda		8.07E+09					14	1		48				4			KWG-KM-I	kwassip	0000-00-0	0000-00-00 0

This is a copy of Kwara state transport users dataset whereby I was given the task to help clean and refine the dataset where some set are missing values, and leverage other set that are incomplete and needed to be filled up and to eliminate duplicate set in the dataset. This project allowed me to see how the interface of a dataset looks like and how you handle and operate on it. This is the first dataset I have ever handled and I wouldn't have been able to handle it well without the help of my senior colleague who put me through the basics of it .(Albert Ogunsanya).

3. Data Analysis (Beginner):

Helped with a project whereby an Insurance Company that wanted to detect Fraudulent Activities in their Customer and Company Transaction Details and how t analyze it and filter it out, in this project we had to study the companies data set and know where and what we are looking for in a dataset.

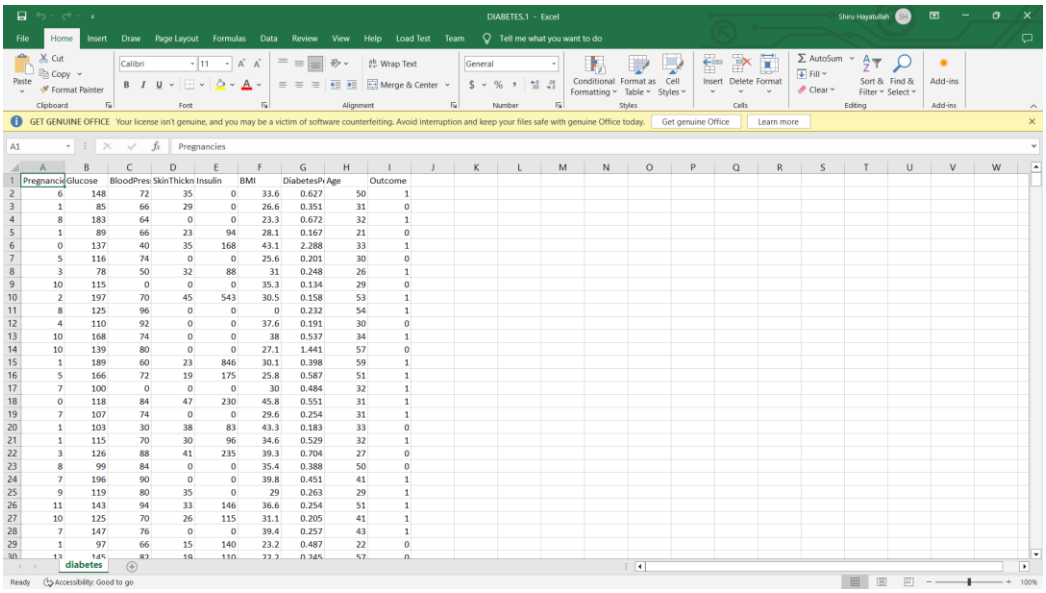


This is the excel format of the dataset used by the company, whereby I analyzed and refined the dataset so that I can be able to use the necessary set to create my visual representation. The main purpose of this particular project is to help detect fraud from the customers if weather their claims of complaint are true or not and if a customer is collecting more than what he was meant to or insured.

I learnt a lot from this particular project because it helped me with knowing how to be able to analyze and refine dataset, and how to present a visual representation of a dataset.

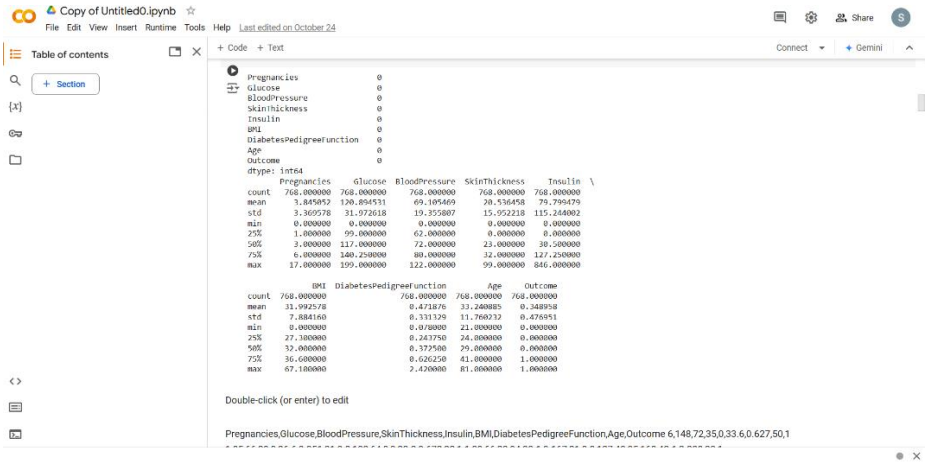
3.Data Science Project :

This Particular project is a Collaborative work between my course mate (AJAYI ERIOLUWA)and me where by we built a model that was able to analyze, detect, and predict if someone has had or is going to have or has already had diabetes with the patient record being used.



Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	DiabetesPedigreeFunction	Age	Outcome
6	148	72	35	0	33.6	0.627	50	1
1	85	66	29	0	26.6	0.351	31	0
8	183	64	0	0	23.3	0.672	32	1
1	89	66	23	94	28.1	0.167	21	0
0	137	40	35	168	43.1	2.288	33	1
5	116	74	0	0	25.6	0.201	30	0
3	78	50	32	88	31	0.248	26	1
10	115	0	0	0	35.3	0.134	29	0
2	197	70	45	543	30.5	0.158	53	1
8	125	96	0	0	0	0.232	54	1
4	110	92	0	0	37.6	0.191	30	0
10	168	74	0	0	38	0.537	34	1
10	139	80	0	0	27.1	1.441	57	0
1	189	60	23	846	30.1	0.398	59	1
5	166	72	19	175	25.8	0.587	51	1
7	100	0	0	0	30	0.484	32	1
0	118	84	47	230	45.8	0.551	31	1
7	107	74	0	0	29.6	0.254	31	1
1	103	30	38	83	43.3	0.183	33	0
1	115	70	30	96	34.6	0.529	32	1
3	126	88	41	235	39.3	0.704	27	0
8	99	84	0	0	35.4	0.388	50	0
7	196	90	0	0	39.8	0.451	41	1
9	119	80	35	0	29	0.263	29	1
11	143	94	33	146	36.6	0.254	51	1
10	125	70	26	115	31.1	0.205	41	1
7	147	76	0	0	39.4	0.257	43	1
1	97	66	15	140	23.2	0.487	22	0

This is the dataset being used to carry out this particular project , which contains each patient (insulin level, age, blood group, and genotype with skin thickens.)



```
Pregnancies                 0
Glucose                     0
BloodPressure               0
SkinThickness               0
Insulin                     0
BMI                         0
DiabetesPedigreeFunction    0
Age                         0
Outcome                     0
dtype: int64
       Pregnancies     Glucose  BloodPressure  SkinThickness     Insulin  \
count   768.000000  768.000000     768.000000     768.000000  768.000000
mean      3.845052  120.894531      69.105469      20.536458   79.799479
std       3.369578   31.972618      19.355807      15.952218  115.244002
min       0.000000    0.000000       0.000000       0.000000    0.000000
25%       1.000000   99.000000      62.000000       0.000000    0.000000
50%       3.000000  117.000000      72.000000      23.000000   30.500000
75%       6.000000  140.250000      80.000000      32.000000  127.250000
max      17.000000  199.000000     122.000000      99.000000  846.000000

              BMI  DiabetesPedigreeFunction         Age     Outcome
count  768.000000                768.000000  768.000000  768.000000
mean    31.992578                  0.471876   33.240885    0.348958
std      7.884160                  0.331329   11.760232    0.476951
min      0.000000                  0.078000   21.000000    0.000000
25%     27.300000                  0.243750   24.000000    0.000000
50%     32.000000                  0.372500   29.000000    0.000000
75%     36.600000                  0.626250   41.000000    1.000000
max     67.100000                  2.420000   81.000000    1.000000
```

Double-click (or enter) to edit

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Pregnancies,Glucose,BloodPressure,SkinThickness,Insulin,BMI,DiabetesPedigreeFunction,Age,Outcome
6,148,72,35,0,33.6,0.627,50,1
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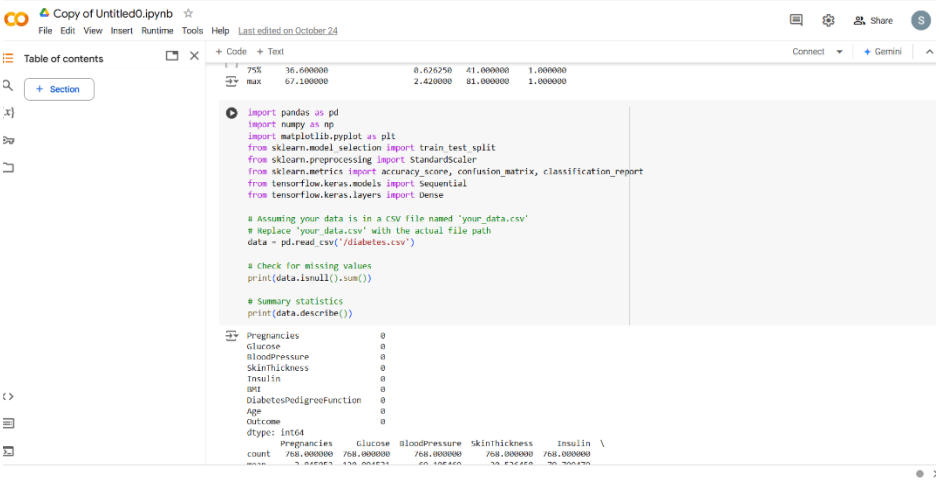
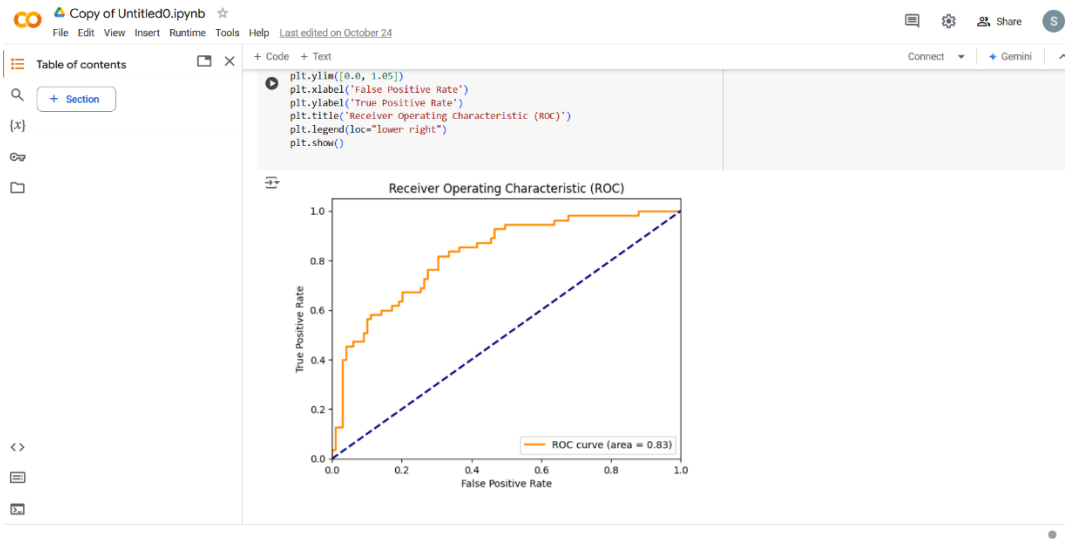


```
75%     36.600000                  0.626250   41.000000    1.000000
max     67.100000                  2.420000   81.000000    1.000000
```

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.metrics import accuracy_score, confusion_matrix, classification_report
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense

# Assuming your data is in a CSV file named 'your_data.csv'
# Replace 'your_data.csv' with the actual file path
data = pd.read_csv('/diabetes.csv')

# Check for missing values
print(data.isnull().sum())

# Summary statistics
print(data.describe())
```

```
Pregnancies                 0
Glucose                     0
BloodPressure               0
SkinThickness               0
Insulin                     0
BMI                         0
DiabetesPedigreeFunction    0
Age                         0
Outcome                     0
dtype: int64
       Pregnancies     Glucose  BloodPressure  SkinThickness     Insulin  \
count   768.000000  768.000000     768.000000     768.000000  768.000000
```

This is the interface being used by me to carry out sorting and analyzing and predicting outcomes of the dataset and the accuracy level we used decision tree classify for the predictive model which gave us an accuracy of 74.21% Accuracy rate.



This is a Data Visualization representing the chart of the predictive diabetes model on the positive index rate and false positive rate .

Chapter Three: Problems Encountered and Solutions

During my SIWES training at the Kwara State Innovation Hub as a beginner in data science and analysis, I encountered several challenges. These problems were addressed through various strategies and support mechanisms, which contributed to my growth and learning experience.

Problems Encountered

1. **Understanding the Fundamentals of Python Programming**
    - As a beginner, I initially struggled with understanding Python syntax and programming concepts, such as loops, conditional statements, and functions. Writing efficient code to manipulate datasets felt overwhelming.
2. **Data Cleaning Complexities**
    - Handling datasets with missing values, duplicates, and inconsistent formats was challenging. I often found it difficult to decide which data cleaning techniques to apply without losing valuable information.
3. **Creating Effective Visualizations**
    - Generating meaningful and visually appealing charts and graphs in Tableau required a good understanding of design principles and selecting the right type of visualization for specific datasets.
4. **Limited Time for Hands-on Practice**
    - Due to the structured nature of the training, there was limited time to fully explore the tools and concepts taught during sessions.
5. **Challenges in Understanding Statistical Concepts**
    - Key statistical measures such as standard deviation, correlation, and regression analysis were initially confusing and required additional effort to comprehend.
6. **Working with Real-World Datasets**
    - Real-world datasets were often messy and unstructured, making it difficult to apply theoretical knowledge.
    -

Solutions

1. **Mentorship and Guidance**
    - I received consistent support from trainers and peers who simplified complex topics, provided code samples, and guided me step-by-step through practical tasks.
2. **Utilization of Online Resources**
    - I relied on online platforms such as Coursera, Kaggle, and YouTube tutorials to reinforce the concepts taught during training. Python-specific resources like W3Schools and GeeksforGeeks were particularly helpful.
3. **Practice through Mini-Projects**
    - To overcome my challenges, I worked on mini-projects such as cleaning small datasets, creating simple dashboards, and building basic predictive models to solidify my understanding.
4. **Engaging with Open-Source Communities**
    - Platforms like Stack Overflow and GitHub provided a wealth of community-driven solutions and examples that addressed specific problems I faced.
5. **Breaking Down Statistical Concepts**
    - I studied statistical concepts in smaller, manageable parts using visual aids and interactive tools like Excel to gain a deeper understanding of how these concepts applied to data analysis.
6. **Incremental Learning Approach**
    - I adopted an incremental learning approach, focusing on one tool or concept at a time (e.g., mastering Excel before moving on to Python and Tableau). This made the learning process less overwhelming.
7. **Leveraging Structured Templates**
    - Using pre-built templates and examples in Tableau, I learned how to design visualizations effectively and gradually developed my own style.

8. **Collaborative Learning**
    - Collaborating with peers during group assignments allowed me to learn new techniques and gain fresh perspectives on solving problems.

Chapter Four: Summary, Conclusion, and Recommendations.

4.1 Summary

The SIWES training at Kwara State Innovation Hub was an invaluable experience that introduced me to the fundamentals of data science and analysis. Through practical sessions and hands-on projects, I developed a basic understanding of programming using Python, data cleaning techniques, and visualization tools such as Tableau.

Despite challenges such as understanding Python syntax, cleaning unstructured datasets, and creating effective visualizations, I overcame these hurdles by leveraging mentorship, online resources, and collaborative learning. The training provided a strong foundation for pursuing advanced skills in data science, particularly in statistical analysis, machine learning, and data-driven decision-making.

4.2 Conclusion

The SIWES program successfully exposed me to the key principles of data science, including data collection, preprocessing, analysis, and visualization. It also demonstrated the importance of continuous learning in the ever-evolving field of data science. My experience at the Kwara State Innovation Hub has inspired me to further explore advanced topics, such as predictive modeling and big data analysis, in my next SIWES training or independent study.

The structured environment, coupled with real-world projects, has not only enhanced my technical skills but also fostered a problem-solving mindset and adaptability, which are crucial traits for success in the field of data science.

4.3 Recommendations

Based on my SIWES training experience, I propose the following recommendations:

1. **For Future SIWES Participants:**
    - Dedicate more time to hands-on practice and actively seek clarification on unclear topics.
    - Explore online courses and certifications to supplement the knowledge gained during the training.

- Collaborate with peers and mentors to accelerate learning and exchange ideas.

2. **For Kwara State Innovation Hub:**
    - Extend the duration of practical sessions to allow for deeper exploration of tools and concepts.
    - Incorporate more real-world datasets and case studies to simulate industry challenges.
    - Provide tailored mentorship for participants based on their skill levels and learning objectives.
3. **For Academic Institutions:**
    - Integrate data science fundamentals into the curriculum before SIWES training to equip students with basic knowledge.
    - Encourage students to document their learning progress systematically for future reference.

References

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Appendices

Appendix A: Python Code Snippet for Data Cleaning

```
import pandas as pd
```

```
# Load dataset
data = pd.read_csv('data.csv')

# Handle missing values
data.fillna(method='ffill', inplace=True)

# Remove duplicates
data = data.drop_duplicates()

# Save cleaned data
data.to_csv('cleaned_data.csv', index=False)
```

Appendix B: Tableau Visualization Example

- Screenshot of a dashboard showing sales trends over time using Tableau.

Appendix C: SIWES Weekly Log Summary

Week	Activities	Skills Gained
Week 1	Introduction to Python	Basic Python syntax, loops, functions
Week 2	Data cleaning techniques	Handling missing values, duplicates
Week 3	Data visualization in Tableau	Creating bar charts, line graphs
Week 4	Real-world project on sales data	Data-driven insights, reporting

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This chapter concludes the SIWES report, summarizing my experience, highlighting the lessons learned, and providing recommendations for continuous improvement.