SPYPRO SECURITY SOLUTIONS Pvt. Ltd.,

CYBERSECURITY

Day 1: Introduction to IoT and Hardware Setup

Morning Session:

1. **Welcome and Introduction**
   - Overview of the Workshop
   - Learning Objectives
   - Introduction to IoT
2. **Basics of IoT**
   - Definition and Scope
   - IoT Architecture and Components
   - IoT Applications and Use Cases
3. **Hardware Platforms for IoT**
   - Overview of popular IoT hardware (Arduino, Raspberry Pi, ESP8266/ESP32)
   - Selection criteria for IoT projects

Afternoon Session:

4. **Setting Up IoT Hardware**
   - Getting Started with Arduino/Raspberry Pi
   - Installing necessary software and drivers
   - Hands-on: Blinking LED, Reading Sensor Data
5. **Introduction to Sensors and Actuators**
   - Types of Sensors (Temperature, Humidity, Motion, etc.)

- Types of Actuators (Motors, Relays, etc.)
- Hands-on: Connecting and reading data from sensors

Evening Session:

6. **Basic Networking for IoT**
   - Introduction to Networking Concepts
   - Connecting IoT Devices to the Internet
   - Hands-on: Sending Sensor Data to the Cloud

Day 2: Data Collection, Storage, and Basic Analytics

Morning Session:

1. **Data Collection in IoT**
   - Techniques for Data Collection
   - Protocols for Data Transmission (MQTT, HTTP, CoAP)
2. **Storing IoT Data**
   - Cloud Storage Solutions (AWS, Azure, Google Cloud)
   - Local Storage Solutions (Databases, Files)

Afternoon Session:

3. **Introduction to Data Analytics**
   - Basics of Data Analytics
   - Importance of Data Analytics in IoT
4. **Data Preprocessing**
   - Data Cleaning and Transformation
   - Hands-on: Preprocessing IoT Data

Evening Session:

5. **Basic Visualization Techniques**
   - Tools for Data Visualization (Matplotlib, Plotly, Grafana)
   - Hands-on: Visualizing IoT Data

Day 3: Introduction to Machine Learning for IoT

Morning Session:

1. **Introduction to Machine Learning**
   - Overview of Machine Learning
   - Types of Machine Learning Algorithms
   -
2. **Machine Learning for IoT**
   - Use Cases of ML in IoT
   - ML Workflow (Data Collection, Training, Deployment)

Afternoon Session:

3. **Building a Simple ML Model**
   - Choosing a Dataset
   - Splitting Data into Training and Testing Sets
   - Hands-on: Training a Simple ML Model (e.g., Linear Regression, Decision Tree)
4. **Deploying ML Models on IoT Devices**
   - Introduction to Edge Computing
   - Tools for ML Deployment on IoT (TensorFlow Lite, Edge Impulse)
   - Hands-on: Deploying a Trained Model on an IoT Device

Evening Session:

5. **Advanced Topics and Future Trends**
   - Advanced IoT Architectures (Fog Computing, Edge Computing)
   - Emerging Trends in IoT and ML (AIoT, TinyML)
   - Q&A and Wrap-Up