sanika patole

TCS2324054

TCS2324054 WSN JOURNAL

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**S.I.E.S College of Arts, Science and Commerce(Autonomous)**

**Sion(W), Mumbai –  400 022.**

**CERTIFICATE**

This is to certify that Miss. **SANIKA SANJAY PATOLE** Roll No. **TCS2324054** has successfully completed the necessary course of experiments in  the subject of  **Wireless Sensor Networks & Mobile Communication** during the academic year   **2023 – 2024** complying with the requirements of **University of Mumbai**, for the course of  **TYBSc Computer Science [Semester-VI].**

Prof. In-Charge

**JESICA D’CRUZ**

Examination date:

Examiner’s Signature & Date:

Head of the Department College Seal

**Prof. Manoj Singh**

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| **Name:** | SANIKA PATOLE | **Roll Number** | TCS2324054 |
| **Paper Code:** | SIUSCS64 | **Class** | TYBSc(Computer Science) |
| **Topic:** | SENSOR NODES | **Batch** | 2 |
| **Date:** | 08TH JANUARY 2024 | **Practical No** | 1 |
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| **A) AIM:**  Understanding the sensor node hardware.  **B) DESCRIPTION:**  Sensor nodes are small electronic devices that are designed to collect and transmit data from sensors. They typically consist of several hardware components, including:  Microcontroller: This is the brain of the sensor node and is responsible for executing the program instructions and interfacing with other hardware components.  Sensors: These are the components that collect data from the environment. There are many types of sensors, including temperature, humidity, light, motion, and more.  Power source: Sensor nodes require power to operate, and this can come from a variety of sources, including batteries, solar panels, or energy-harvesting devices.  Wireless communication module: This allows the sensor node to transmit the data it has collected to a central hub or other nodes in a network. The communication module may use various wireless protocols, such as Bluetooth, Wi-Fi, or LoRaWAN.  Memory: Sensor nodes often have limited memory, but it is still necessary for storing program code, sensor data, and other relevant information.  Overall, the hardware components of a sensor node are carefully chosen and optimized for low power consumption, small size, and reliability to enable efficient data collection and transmission in a variety of applications. | | | |
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| **Name:** | SANIKA PATOLE | **Roll Number** | TCS2324054 |
| **Paper Code:** | SIUSCS64 | **Class** | TYBSc(Computer Science) |
| **Topic:** | TINYOS | **Batch** | 2 |
| **Date:** | 08TH JANUARY 2024 | **Practical No** | 2.1 |
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| **A) AIM:**  Exploring and understanding Tiny OS.  **B) DESCRIPTION:**  TinyOS is an open-source operating system designed for lowpower, wireless sensor networks. It is written in the nesC programming language and provides a lightweight, eventdriven architecture to conserve energy and resources.  To explore and understand TinyOS, you can start by reviewing the documentation available on the TinyOS website, including the programming guide, API reference, and tutorials. You can also experiment with TinyOS on a development platform such as the TelosB mote or the Crossbow MICAz.  To get started, you may want to install the TinyOS development environment, which includes the TinyOS toolchain and support for various hardware platforms. You can then write and compile TinyOS applications using the nesC programming language and deploy them on your sensor nodes.  Some key concepts to understand when working with TinyOS include components, interfaces, and events. Components are modular units of code that perform specific functions, while interfaces define the interactions between components. Events are used to trigger component actions and handle interrupts.  Overall, exploring and understanding TinyOS requires a hands-on approach and a willingness to experiment and learn through trial and error. With persistence and dedication, you can develop a solid understanding of TinyOS and use it to build innovative sensor network applications. | | | |
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| **Name:** | SANIKA PATOLE | **Roll Number** | TCS2324054 |
| **Paper Code:** | SIUSCS64 | **Class** | TYBSc(Computer Science) |
| **Topic:** | TOSSIM | **Batch** | 2 |
| **Date:** | 08TH JANUARY 2024 | **Practical No** | 2.2 |
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| **A) AIM:**  Exploring and understanding Tossim.  **B) DESCRIPTION:**  TOSSIM, short for TinyOS Simulator, is a powerful tool used in the field of wireless sensor networks (WSNs) for simulating and analyzing the behavior of networked sensor nodes. Developed primarily for research and educational purposes, TOSSIM offers a high-fidelity simulation environment that emulates the execution of TinyOS-based applications on sensor nodes without the need for physical hardware. This allows researchers and developers to test their algorithms, protocols, and applications in a controlled and repeatable manner, facilitating the exploration of various network configurations and scenarios. TOSSIM provides features such as event-driven simulation, support for realistic radio propagation models, and integration with debugging and visualization tools, enabling comprehensive analysis of WSN behavior and performance. Its versatility and scalability make it an indispensable asset for advancing the understanding and development of wireless sensor networks, offering insights that can inform the design of more efficient and robust systems for diverse applications ranging from environmental monitoring to industrial automation. | | | |
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| **Name:** | SANIKA PATOLE | **Roll Number** | TCS2324054 |
| **Paper Code:** | SIUSCS64 | **Class** | TYBSc(Computer Science) |
| **Topic:** | LAWN SPRINKLER | **Batch** | 2 |
| **Date:** | 08TH JANUARY 2023 | **Practical No** | 3.1 |
|  | | | |
| **A) AIM:**  Design and simulate Smoke detection and fire prevention system.  **B) DESCRIPTION:** | | | |
| **C) NETWORK TOPOLOGY, CONFIGURATIONS AND OUTPUT:**  **Network topology(only for cisco packet tracer practical’s):**  Devices: Server, Access Point (AP-PT), Lawn Sprinkler, Smoke Detector, 3 Cars  **Configurations:**   1. Give SSID and IP address of lawn sprinkler in config wireless0. give SSID name has cisco. 2. In config Settings go to IoT Server and in Remote Server give Server address which is given on the Registered   Server and connect with Username and Password with “admin” then connect.          **Output** | | | |
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| **Name:** | SANIKA PATOLE | **Roll Number** | TCS2324054 |
| **Paper Code:** | SIUSCS64 | **Class** | TYBSc(Computer Science) |
| **Topic:** | IRRIGATION SYSTEM | **Batch** | 2 |
| **Date:** | 15TH JANUARY 2024 | **Practical No** | 3.2 |
|  | | | |
| **A) AIM:**  Design and simulate irrigation system.  **B) DESCRIPTION:** | | | |
| **C) NETWORK TOPOLOGY, CONFIGURATIONS AND OUTPUT:**  **Network topology(only for cisco packet tracer practical’s):**  Devices: Server, Access Point (AP-PT), Lawn Sprinkler, Water Level Monitor.  **Configurations:**   1. Give SSID and IP address of lawn sprinkler in config wireless0. give SSID name has cisco. 2. In config Settings go to IoT Server and in Remote Server give Server address which is given on the Registered   Server and connect with Username and Password with “admin” then connect.  Lawn Sprinkler Steps:   1. Give SSID and IP address of lawn sprinkler in config wireless0. give SSID name has cisco. 2. In config Settings go to IoT Server and in Remote Server give Server address which is given on the Registered Server and connect with Username and Password with “admin” then connect.   Water Level Monitor Steps:   1. Give SSID and IP address of lawn sprinkler in config wireless0. give SSID name has cisco. 2. In config Settings go to IoT Server and in Remote Server give Server address which is given on the Registered Server and connect with Username and Password with “admin” then connect.   Server Steps contd.:   1. Go to condition and give the condition click Add. 2. First condition: Sprinkler on when water level <= 10.0 cm 3. Second condition: Sprinkler off when water level > 10.0 cm   After giving condition put your cursor on Lawn Sprinkler and hold Alt+ Click to start the simulation  **Output**        **Output** | | | |
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| **Name:** | SANIKA PATOLE | **Roll Number** | TCS2324054 |
| **Paper Code:** | SIUSCS64 | **Class** | TYBSc(Computer Science) |
| **Topic:** | SIMPLE ADHOC(OMNET++) | **Batch** | 2 |
| **Date:** | 05TH FEBRUARY 2024 | **Practical No** | 4 |
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| **A) AIM:**  Create simple adhoc network in omnet++.  **B) DESCRIPTION:** | | | |
| **C) NETWORK TOPOLOGY, CONFIGURATIONS AND OUTPUT:**  **STEPS:**   1. Go to file -> import -> general -> Existing project into workspace -> browse inet folder (C drive) -> Finish. 2. Project -> Build All or you can press ctrl + B. 3. Click inet folder -> example folder (open) -> adhoc folder (open) 4. Right click on adhoc folder -> New -> networkDescription file(.ned) -> net1.ned-> next 5. General wizards ->new adhoc modularity -> specify number no host -> Finish. 6. Run your net1.ned file. 7. Click on the run button to see the simulation.   **Output:** | | | |
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| **Name:** | SANIKA PATOLE | **Roll Number** | TCS2324054 |
| **Paper Code:** | SIUSCS64 | **Class** | TYBSc(Computer Science) |
| **Topic:** | RIP PROTOCOL | **Batch** | 2 |
| **Date:** | 29TH JANUARY 2024 | **Practical No** | 5 |
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| **A) AIM:**  Create a computer network using 3 routers, 3 switches and 6 pcs and implement RIP protocol. **B) DESCRIPTION:** | | | |
| **C) NETWORK TOPOLOGY, CONFIGURATIONS AND OUTPUT:**  **Network topology(only for cisco packet tracer practical’s):**  Router Steps:   1. Turn off the router and add in 2 Physical modules: WIC1T. 2. In config FastEthernet0/0 or 0/1 in which the ports are connected to switches. put Ipv4 address for the devices. 3. In config Serial0/0/0 or 0/1/0 in which the ports are connected to routers. put Ipv4 address for the connecting devices. 4. After doing for all routers go to Configure add the network address for which is connected to the switches and the next router Ip address PC Steps:   **Configurations:**   1. In Config Settings give the Gateway/DNS Ipv4 static Default Gateway address.   2.In Config FastEthernet0 Ipv4 Address. Give a Ip address of the pc  **Output :** | | | |
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| **Name:** | SANIKA PATOLE | **Roll Number** | TCS2324054 |
| **Paper Code:** | SIUSCS64 | **Class** | TYBSc(Computer Science) |
| **Topic:** | WIRELESS NETWORK(OMNET++) | **Batch** | 2 |
| **Date:** | 05TH FEBRUARY 2023 | **Practical No** | 6 |
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| **A) AIM:**  Create wireless network in OMNET++.  **B) DESCRIPTION:** | | | |
| **C) NETWORK TOPOLOGY, CONFIGURATIONS AND OUTPUT:**  **Network topology(only for cisco packet tracer practical’s):**  **Configurations:**   1. Go to file -> import -> general -> Existing project into workspace -> browse inet folder (C drive) -> Finish. 2. Project -> Build All or you can press ctrl + B. 3. Click on inet folder -> Example Folder -> Open Wireless folder -> right click wireless and create new .ned file. 4. click Next-> managed mobility wireless network -> select no of host -> finish.   Run the project.  **Output :** | | | |
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| **Name:** | SANIKA PATOLE | **Roll Number** | TCS2324054 |
| **Paper Code:** | SIUSCS64 | **Class** | TYBSc(Computer Science) |
| **Topic:** | MAC PROTOCOL | **Batch** | 2 |
| **Date:** | 06TH FEBRUARY 2024 | **Practical No** | 7 |
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| **A) AIM:**  Create MAC protocol simulation implementation for wireless sensor network.  **B) DESCRIPTION:** | | | |
| **C) NETWORK TOPOLOGY, CONFIGURATIONS AND OUTPUT:**  **Network topology(only for cisco packet tracer practical’s):**  Devices: Wireless Router (WRT300N), 2 Smartphone-PT, 3 Laptop-PT, Tablet-PT.  **Configurations:**  Router Steps:   1. In GUI Wireless Wireless Mac Filter, click wireless port to 2.4G and enabled. 2. There are 2 options which are accessing wireless network device with mac Address and accessing wireless network device without mac Address. 3. Select any one so u can see in the output. 4. You can give mac address from the devices of laptop and smartphone. 5. You can find mac address of a device from   Config Wireless0 Mac Address, which is  “0090.0C23.C857”, but when you enter in the Gui of  router mac address the pattern should be “00:90:0C:23:C8:57”.  **Output :** | | | |
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| **Name:** | SANIKA PATOLE | **Roll Number** | TCS2324054 |
| **Paper Code:** | SIUSCS64 | **Class** | TYBSc(Computer Science) |
| **Topic:** | MOBILE ADHOC | **Batch** | 2 |
| **Date:** | 06TH FEBRUARY 2024 | **Practical No** | 8 |
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| **A) AIM:**  Simulate Mobile Adhoc Network with Motion detector sensor and home gateway.  **B) DESCRIPTION:** | | | |
| **C) NETWORK TOPOLOGY, CONFIGURATIONS AND OUTPUT:**  **Network topology(only for cisco packet tracer practical’s):**  Devices: (DLC100) Home Gateway, Smartphone, Fan, Motion Detector Sensor.  **Configurations:**  Smartphone Steps:   1. Go to Config Settings Gateway ipv4 set as DHCP. 2. Go to Config Wireless0 SSID as Home Gateway 3. Go to Desktop Webbrowser type 192.168.25.1 login as “admin” in username and password. 4. Go to Conditions 5. First condition: Sensor on then Fan status on 6. Second condition: Sensor off then Fan status off Fan Steps: 7. Go to Config IoT Server Remote Server and type Server address, username and password then connect. 8. Motion Detector Sensor Steps: Go to Config IoT Server Remote Server and type Server address, username and password then connect.   **Output :** | | | |
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| **Name:** | SANIKA PATOLE | **Roll Number** | TCS2324054 |
| **Paper Code:** | SIUSCS64 | **Class** | TYBSc(Computer Science) |
| **Topic:** | CELL TOWER | **Batch** | 2 |
| **Date:** | 06TH FEBRUARY 2024 | **Practical No** | 9 |
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| **A) AIM:**  Cell Tower  **B) DESCRIPTION:** | | | |
| **C) NETWORK TOPOLOGY, CONFIGURATIONS AND OUTPUT:**  **Network topology**    **Configurations:**  **For 1841 Router:**      **For Server-Pt:**    **Output** | | | |
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