

# WATER PIPELINE BLOCKAGE DETECTION SYSTEM

Guided By:

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# Abstract



- ❑ This project presents an IoT-based system for real-time detection and monitoring of blockages in pipelines.
- ❑ By integrating IoT sensors, the system can automatically identify the location of potential blockages.
- ❑ This significantly improves operational efficiency and reducing repair costs by addressing issues before they escalate.

# Objectives:

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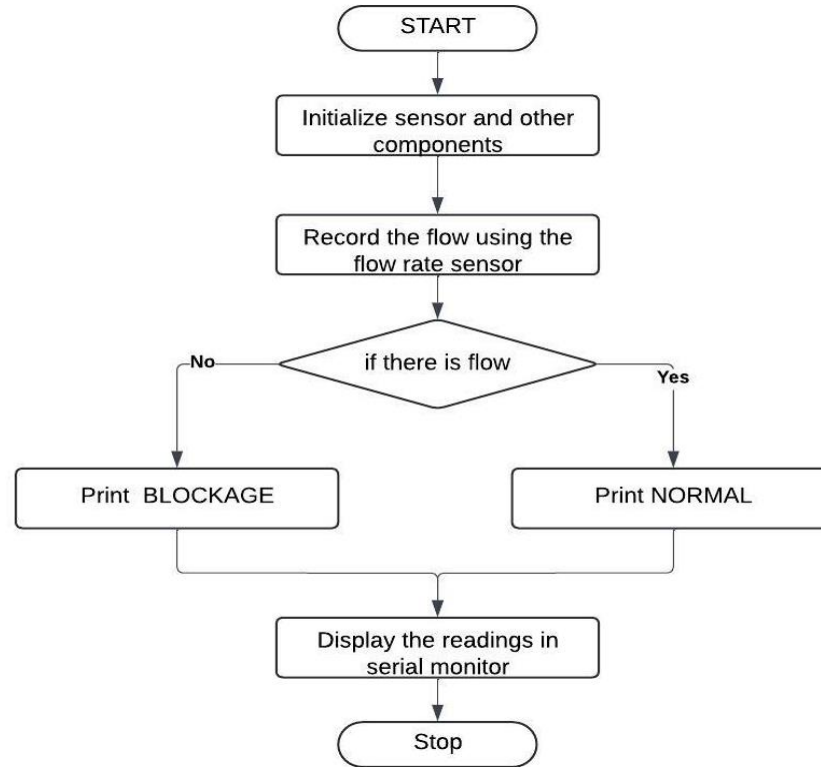
- ❑ To develop a system capable of continuously monitoring pipelines and detecting location of blockages in real-time using IoT sensors.
- ❑ To reduce pipeline downtime by enabling active maintenance and automated blockage alerts
- ❑ To reduce maintenance costs by preventing severe pipeline damage through timely detection of potential blockages

# Components Required:

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- ❑ Arduino Nano
- ❑ Flow Rate sensor
- ❑ LED
- ❑ Resistors
- ❑ Connecting wires
- ❑ USB Cable

# Flow Diagram:



# Implementation:

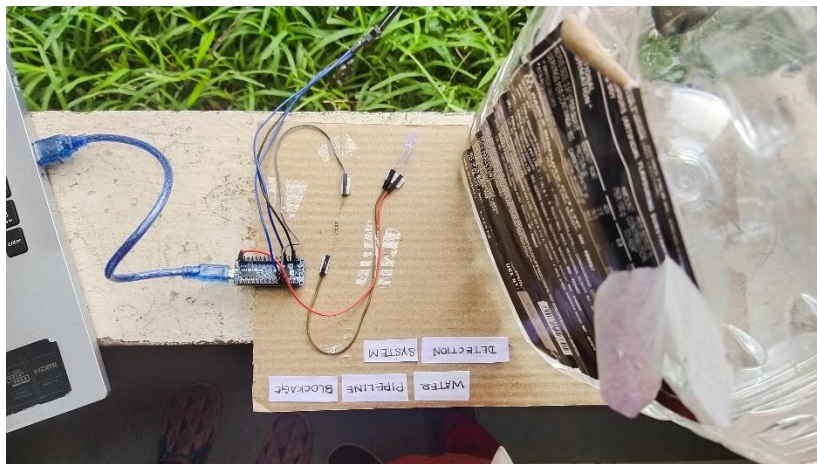
- ❑ Physical sensors are installed in the pipeline to monitor conditions like flow rate and potential blockages.
- ❑ Additionally, It has the efficiency to detect the location of the blockage in the pipeline.
- ❑ Hardware components transmit data from the sensors to the serial monitor.

# Implementation:

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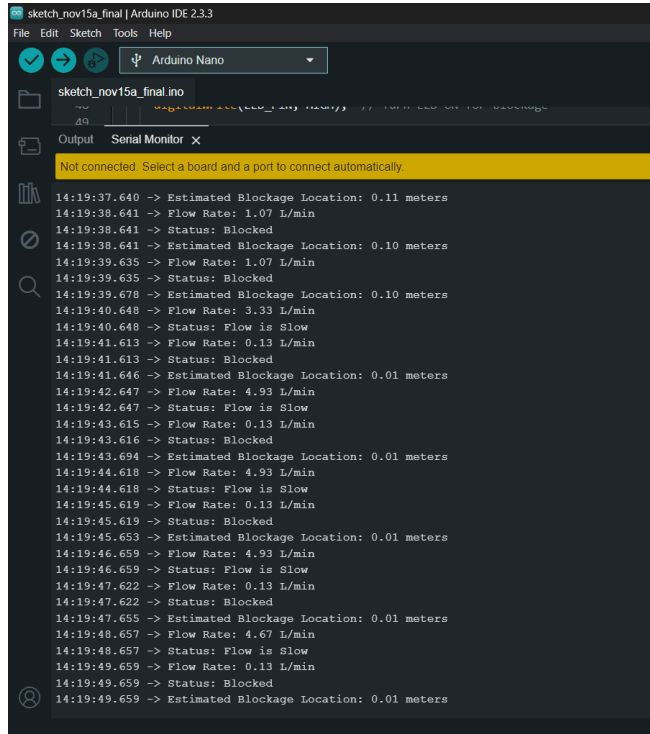
- Arduino IDE
- Tinker Cad (designing)

# Output Screenshot:

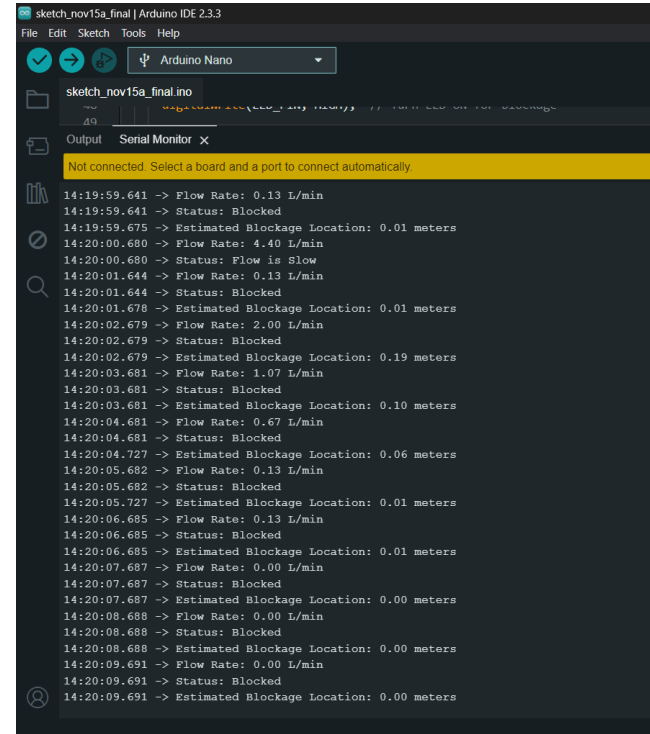




# Output Screenshot:



```
sketch_nov15a_final.ino
14:19:37.640 -> Estimated Blockage Location: 0.11 meters
14:19:38.641 -> Flow Rate: 1.07 L/min
14:19:38.641 -> Status: Blocked
14:19:38.641 -> Estimated Blockage Location: 0.10 meters
14:19:39.635 -> Flow Rate: 1.07 L/min
14:19:39.635 -> Status: Blocked
14:19:39.678 -> Estimated Blockage Location: 0.10 meters
14:19:40.648 -> Flow Rate: 3.33 L/min
14:19:40.648 -> Status: Flow is Slow
14:19:41.613 -> Flow Rate: 0.13 L/min
14:19:41.613 -> Status: Blocked
14:19:41.646 -> Estimated Blockage Location: 0.01 meters
14:19:42.647 -> Flow Rate: 4.93 L/min
14:19:42.647 -> Status: Flow is Slow
14:19:43.615 -> Flow Rate: 0.13 L/min
14:19:43.616 -> Status: Blocked
14:19:43.694 -> Estimated Blockage Location: 0.01 meters
14:19:44.618 -> Flow Rate: 4.93 L/min
14:19:44.618 -> Status: Flow is Slow
14:19:45.619 -> Flow Rate: 0.13 L/min
14:19:45.619 -> Status: Blocked
14:19:45.653 -> Estimated Blockage Location: 0.01 meters
14:19:46.659 -> Flow Rate: 4.93 L/min
14:19:46.659 -> Status: Flow is Slow
14:19:47.622 -> Flow Rate: 0.13 L/min
14:19:47.622 -> Status: Blocked
14:19:47.655 -> Estimated Blockage Location: 0.01 meters
14:19:48.657 -> Flow Rate: 4.67 L/min
14:19:48.657 -> Status: Flow is Slow
14:19:49.659 -> Flow Rate: 0.13 L/min
14:19:49.659 -> Status: Blocked
14:19:49.659 -> Estimated Blockage Location: 0.01 meters
```



```
sketch_nov15a_final.ino
14:19:59.641 -> Flow Rate: 0.13 L/min
14:19:59.641 -> Status: Blocked
14:19:59.675 -> Estimated Blockage Location: 0.01 meters
14:20:00.680 -> Flow Rate: 4.40 L/min
14:20:00.680 -> Status: Flow is Slow
14:20:01.644 -> Flow Rate: 0.13 L/min
14:20:01.644 -> Status: Blocked
14:20:01.678 -> Estimated Blockage Location: 0.01 meters
14:20:02.679 -> Flow Rate: 2.00 L/min
14:20:02.679 -> Status: Blocked
14:20:02.679 -> Estimated Blockage Location: 0.19 meters
14:20:03.681 -> Flow Rate: 1.07 L/min
14:20:03.681 -> Status: Blocked
14:20:03.681 -> Estimated Blockage Location: 0.10 meters
14:20:04.681 -> Flow Rate: 0.67 L/min
14:20:04.681 -> Status: Blocked
14:20:04.727 -> Estimated Blockage Location: 0.06 meters
14:20:05.682 -> Flow Rate: 0.13 L/min
14:20:05.682 -> Status: Blocked
14:20:05.727 -> Estimated Blockage Location: 0.01 meters
14:20:06.685 -> Flow Rate: 0.13 L/min
14:20:06.685 -> Status: Blocked
14:20:06.685 -> Estimated Blockage Location: 0.01 meters
14:20:07.687 -> Flow Rate: 0.00 L/min
14:20:07.687 -> Status: Blocked
14:20:07.687 -> Estimated Blockage Location: 0.00 meters
14:20:08.688 -> Flow Rate: 0.00 L/min
14:20:08.688 -> Status: Blocked
14:20:08.688 -> Estimated Blockage Location: 0.00 meters
14:20:09.691 -> Flow Rate: 0.00 L/min
14:20:09.691 -> Status: Blocked
14:20:09.691 -> Estimated Blockage Location: 0.00 meters
```

# THANK YOU

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