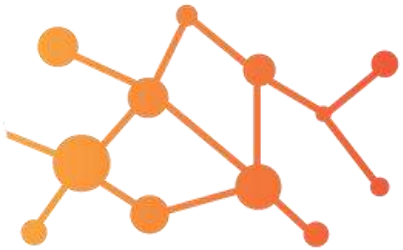

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IoT Application Development using RPi, Python – Phase 1

Madhu Parvathaneni
Director & Certified IoT Expert
Madblocks Technologies Pvt Ltd
mad@madblocks.tech

For questions, write us on iot@madblocks.tech

Agenda

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Session – 1:

IoT Outline

Session – 2:

Raspberry Pi Outline

Session – 3:

Data Collection from Arduino
Data Pumping to Google

Colab

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Session – 1: IoT Outline

IoT – 4D Technology

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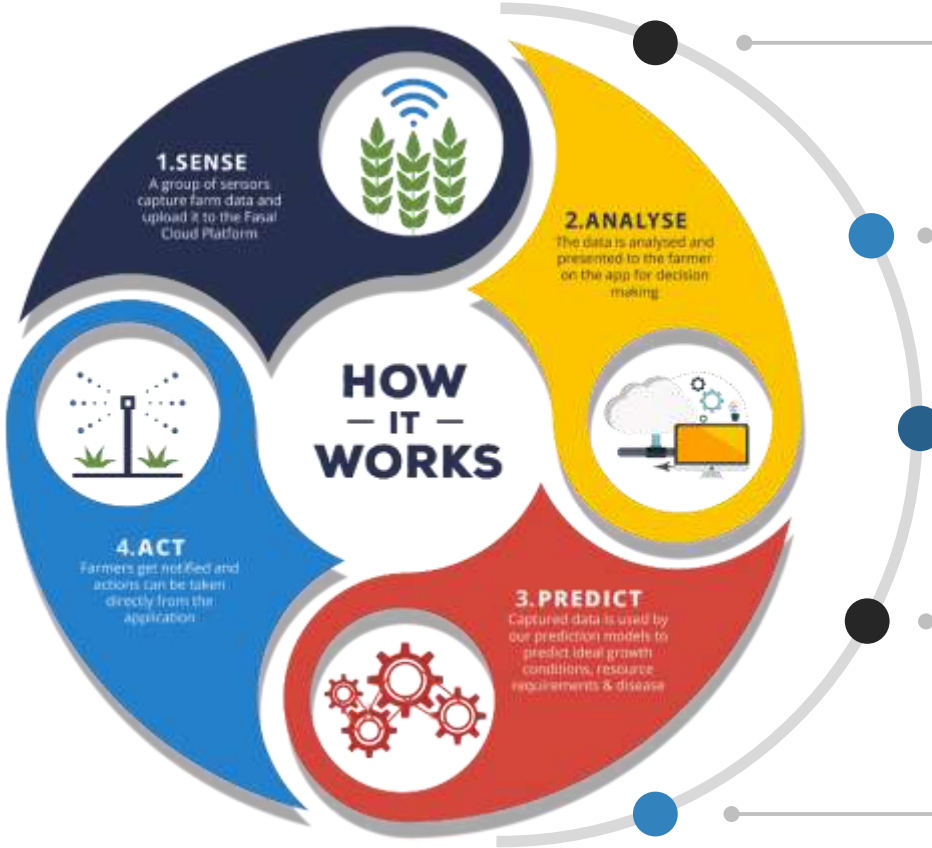

1

Sensors – Data Collection
A group of sensors capture the data from the farm – 1st D

2

Wireless Sensor Network – Intermediate Stage
A network of computers placed across the farm for processing

3

IoT Gateway
A gateway which is a member of WSN and which has internet

4

Cloud Platform – Data Storage & Data Visualization
The farm data sent from the IoT gateway will be stored

5

Predict & Act – Intelligence – Data Analysis
Collected data is sent to prediction models for growth analysis and notified the farmers or IoT gateway through the apps

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Session – 2:
Short Tour on Raspberry Pi

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Raspberry Pi

- Our IoT Gateway

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What is Raspberry Pi?

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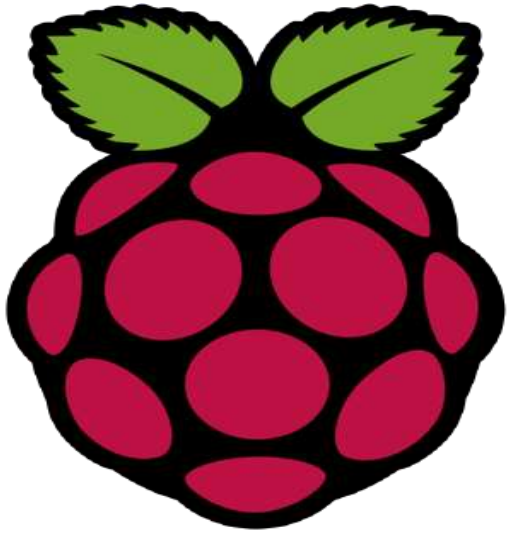
- Credit card **size single board computer or a Programmable PC**
- Developed in U.K. by Raspberry - Pi foundation in 2009
- Concept Initiated by **Eben Upton** who works at Broadcom
- Supported by “University of Cambridge Computer Laboratory & Broadcom”
- To promote the **study of basic computer science** in schools & **to develop interest** among kids and adults
- Has been **a revolution in the market** with over **3 million units** sold
- Video Demo (www.raspberrypi.org)



RasPi in IoT

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- One of the key learning platforms for IoT is the Raspberry Pi

- Open SBC platforms

- Raspberry Pi is a popular platform because it offers a complete Linux server in a tiny platform for a very low cost.

- Raspberry Pi isn't just a great platform for building IoT but also for learning IoT.

Raspberry Pi Models

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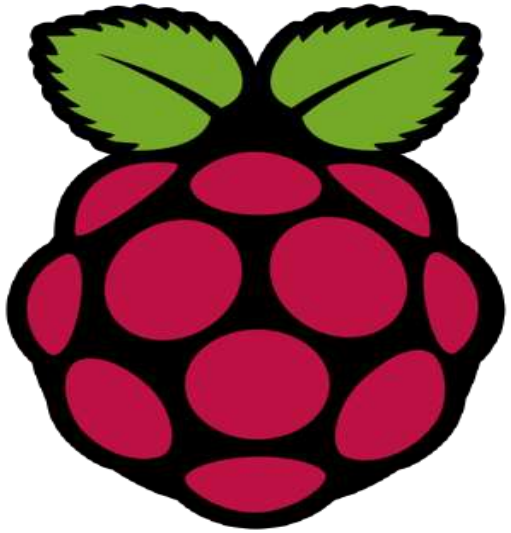
- **4 Main Models/Versions (Raspberry Pi, Pi 2, Pi 3, Pi 4)**
- Raspberry Pi (A, A+, B, B+)
- Raspberry Pi 2 (B+)
- Raspberry Pi 3 (B+)
- Raspberry Pi 4 (B, B+)



New Pi Model

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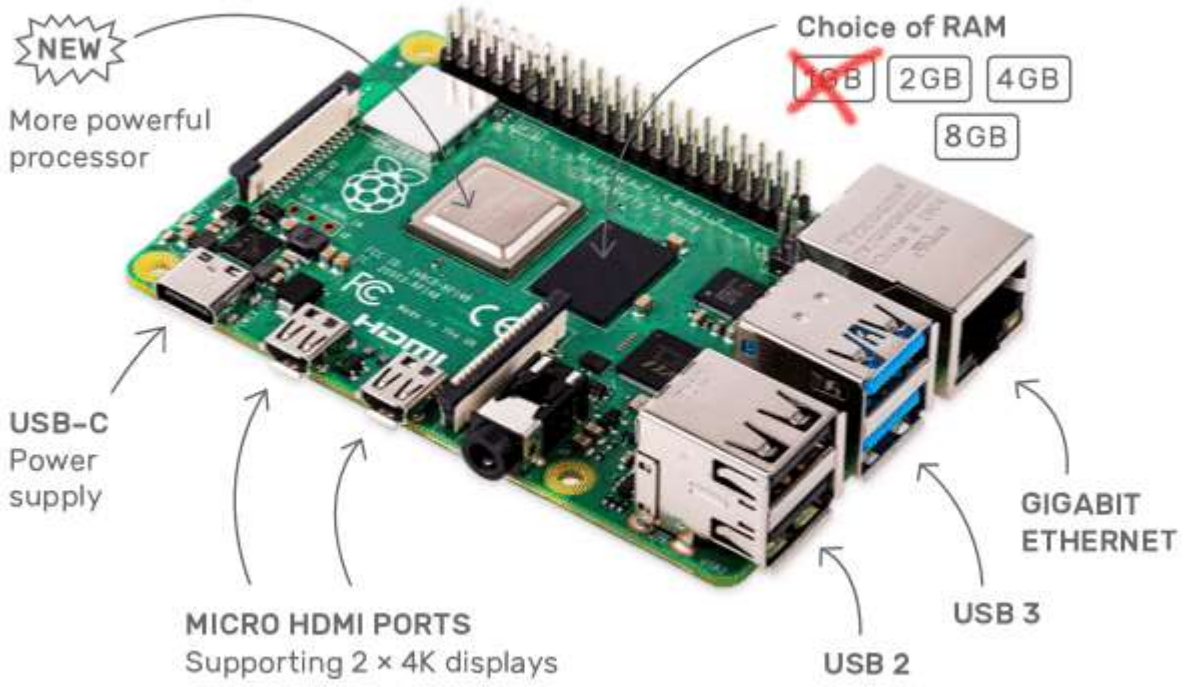

Technical Specs.

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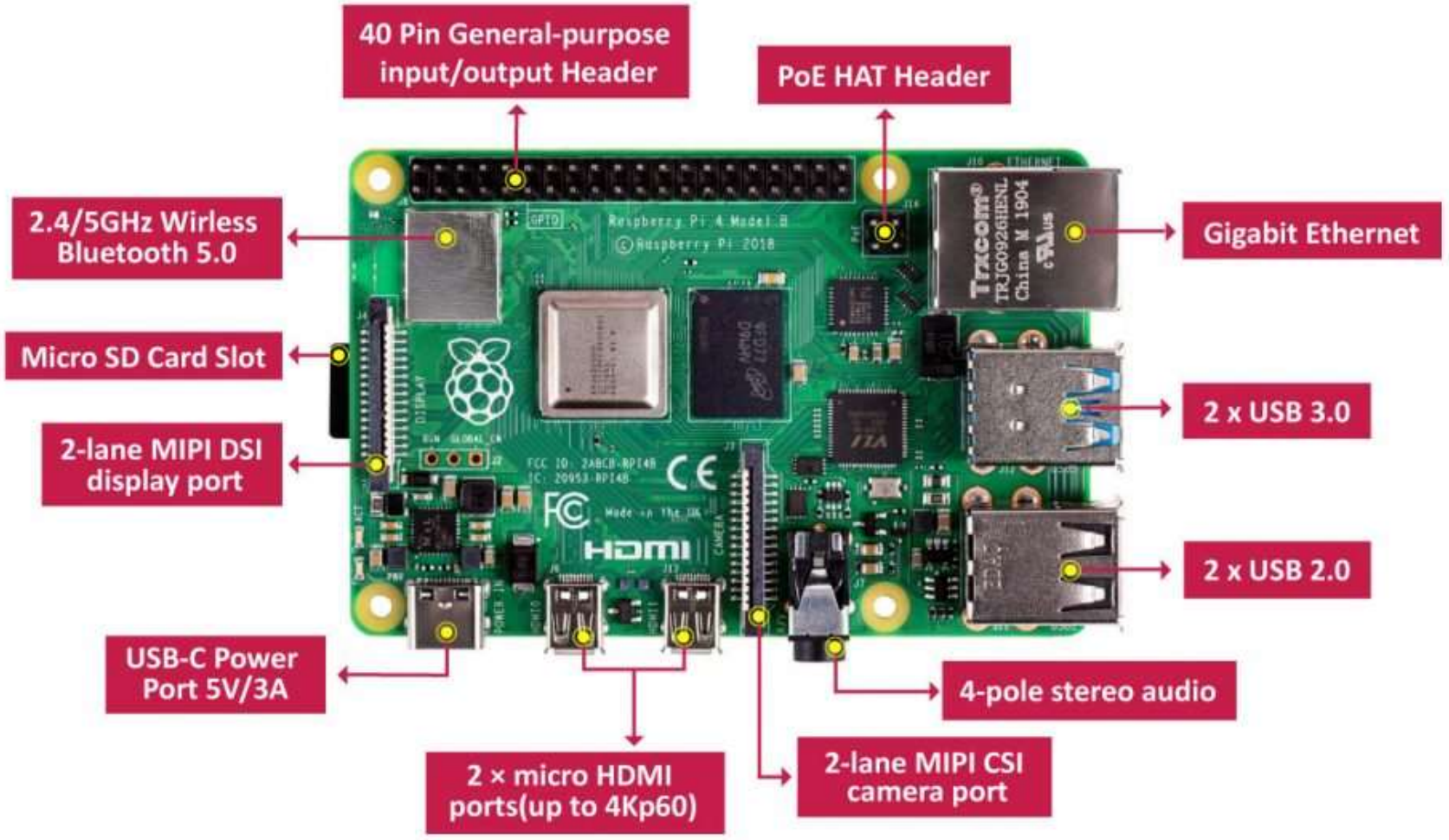

Raspberry Pi vs. PC

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Raspberry Pi & PC

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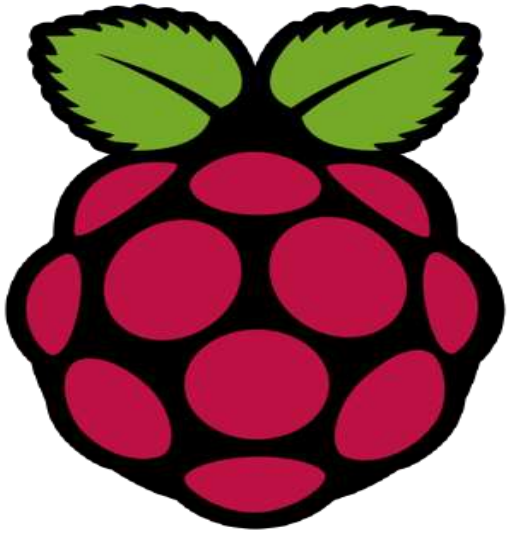

Summary

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Pack-Up!

– Raspberry Pi is a credit-card size computer and works like a cabinet for IoT applications.

– You can deploy your web servers easily on Raspberry Pi for storing and interpreting data.

– Raspberry Pi is a low-cost computing devices heavily used in different IoT use cases.

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Session – 3: Practical Hands-On

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MQTT Protocol

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Features

Small code footprint,
Ideal if processor or memory resources are limited,
Ideal if bandwidth is low or network is unreliable,
Works on top of TCP/IP

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Pub-Sub Model

Publisher – Sender,
Subscriber - Receiver

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Broker and Topic

Broker – Server connecting Pub and Sub
Topic – On which topic the messages are shared
Port – 1883 (Default Broker)
Broker – broker.hivemq.com

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Applications

Smart Home
Smart City
Smart Healthcare
Smart Agriculture
Smart Industries etc….

MQTT Flow

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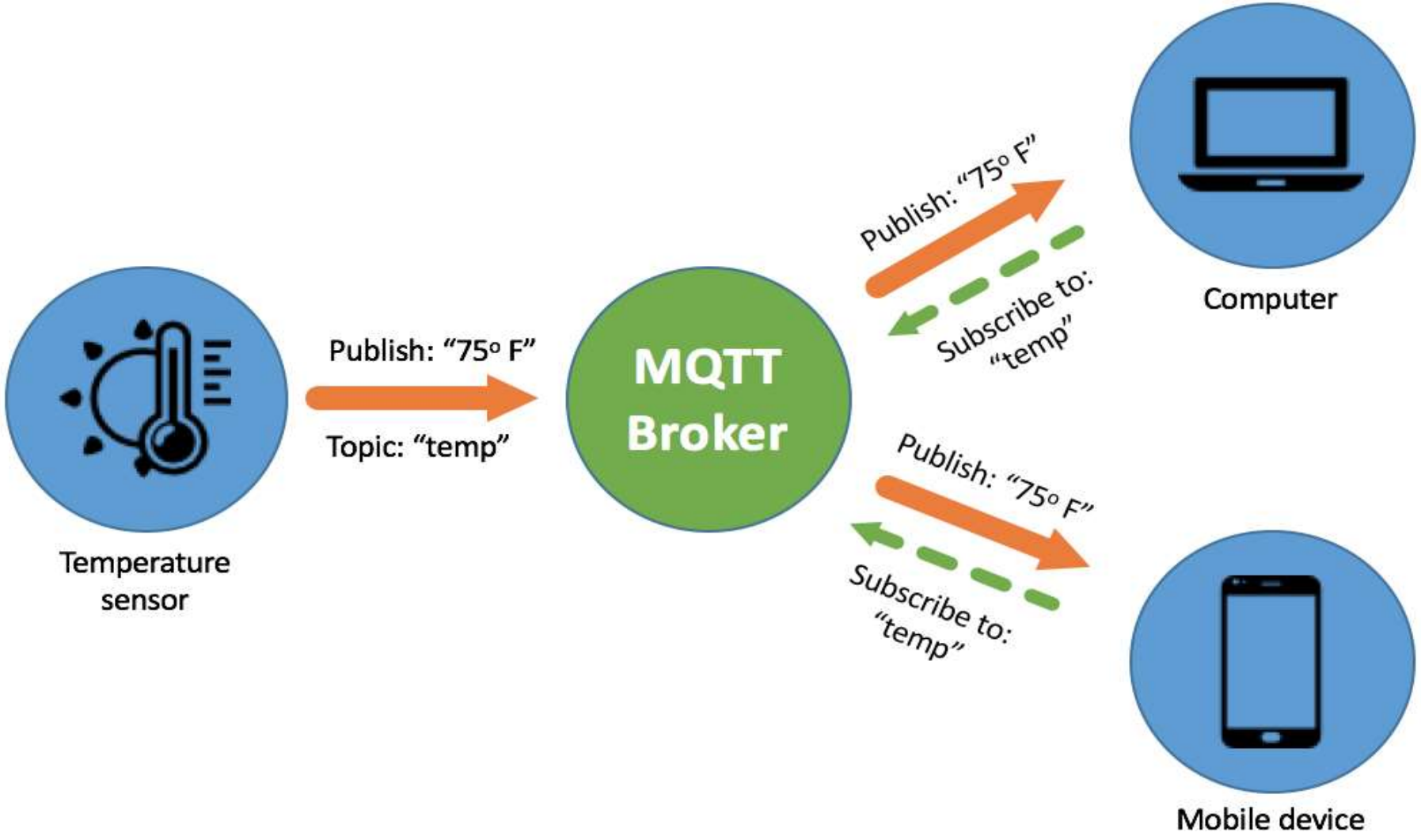

Summary

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Pack-Up!

– We have read the data from Arduino Uno through Raspberry Pi

– We have implemented MQTT Protocol in between the Raspberry Pi and Google Colab

– We are storing the data in the file

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