Project: Data, Information, and Knowledge

80 Points Possible

Due: Tue Oct 28, 2025 11:59pm

Attempt 1

Submitted on Oct 21, 2025 9:59am
NEXT UP: Review Feedback

Attempt 1 Score:
N/A

Add Comment

Unlimited Attempts Allowed
Available until Nov 4, 2025 11:59pm

Details

PROG 102 Code

Project: Data, Information, and Knowledge

Overview

Explain how data, information, and knowledge are represented in modern software systems.

Use the JavaScript knowledge you've gained this semester to create a project that uses data, information, and knowledge. Then write up a short summary explaining how your project demonstrates these three ideas, and how you've used a modern software system to represent them.

✔ Concepts

New Attempt

microprocessors, integrated circuits, and networked systems, and includes core components such as processors, memory, storage, and input/output devices. Modern software systems use different formats and structures to store and process data, turning it into information and knowledge.

Data, Information, and Knowledge

- **Data**: Raw facts, numbers, or symbols.
  Example: `25`, `"John"`, `true`, `["apple", "banana", "cherry"]`
- **Information**: Processed data that has meaning.
  Example: `John is 25 years old.`
- **Knowledge**: Understanding patterns and making decisions based on information.
  Example: `John, being 25, is eligible to vote in elections.`

How Are They Represented in Software?

✅ **Data Representation in Software:**

- **Numbers:** Stored as `int`, `float`, or `double` (`42`, `3.14`).
- **Text:** Stored as `strings` (`"Hello, world!"`).
- **Boolean:** Stored as `true` or `false`.
- **Lists & Arrays:** `["apple", "banana", "cherry"]` → A collection of items.
- **Objects & JSON:** `{ "name": "John", "age": 25 }` → Structured data.

✅ **Information Processing in Software:**

- **Databases:** Store and retrieve structured data (e.g., MySQL, MongoDB).
- **APIs:** Exchange information between systems (e.g., weather API).
- **Data Processing Algorithms:** Sort, filter, and analyze data.

✅ **Knowledge Representation in Software:**

- **Machine Learning & AI:** Recognizes patterns and makes decisions.
- **Expert Systems:** Uses predefined rules to give recommendations (e.g., medical diagnosis software).
- **Data Visualization:** Graphs, charts, and dashboards for insights.

🔍 🌤 Weather Data Processing

This is an example of a project that converts **raw data** (temperature, humidity) into useful **information** (a readable weather report) and then uses logic to generate **knowledge-based advice**.

This is provided as an example of how to identify raw data, information, and knowledge and apply those concepts in an interactive project. This is not an example of topic for you to use in your own project.

Weather app:

1. Raw Data: `temperature = 32°C`, `humidity = 80%`, `condition = "Sunny"`.
2. Information: `"The temperature is 32°C with 80% humidity. It is currently Sunny."`
3. Knowledge: `"It's hot and humid! Stay hydrated and avoid direct sunlight. 🥵💧"`

```
//:::::::::::::::::::::::::::Raw Data
const weatherData = {
    temperature: 32,  // Temperature in Celsius
    humidity: 80,     // Humidity in percentage
    condition: "Sunny"
};

//:::::::::::::::::::::::::::Convert Data Into Useful Information (A Readable Weather Report)

function generateWeatherReport(data) {
    return `The temperature is ${data.temperature}°C with ${data.humidity}% humidity. It is currently ${data.condition}.`;
}

//:::::::::::::::::::::::::::Use Logic to Generate Knowledge-Based Advice

function generateAdvice(data) {
    if (data.temperature > 30 && data.humidity > 75) {
        return "It's hot and humid! Stay hydrated and avoid direct sunlight. 🥵💧";
    } else if (data.temperature < 10) {
        return "It's quite cold. Wear warm clothes! ❄️🧥";
    } else if (data.condition === "Rainy") {
        return "Don't forget your umbrella! ☔";
    } else {
        return "The weather looks fine. Have a great day! 😊";
    }
}

const weatherReport = generateWeatherReport(weatherData);
const advice = generateAdvice(weatherData);

console.log(weatherReport);
console.log(advice);
```

🔍 Examples

📰 Journalism Example: COVID-19 News Report

Journalists use data to uncover trends, analyze events, and inform the public.

NOTE: COVID-19 data is no longer being collected and therefore this topic is a historical example (not one that could be used today).

✅ **Data (Raw Facts):**

- Daily cases: <number> of new cases reported in <city> (example: 10,250 new cases reported in New York City)
- Vaccination rate: <percentage> % of <area> is vaccinated (example: 30% of New York City is vaccinated)
- Number of deaths: <number> of deaths reported today (example: 234 deaths reported today)

✅ **Information (Structured & Contextualized Data):**

- Chicago sees a 15% rise in Covid-19 cases this week.
- New York city is less than half way to the 75% vaccination goal.

✅ **Knowledge (Insights & Decision Making):**

- Due to rising cases, health officials recommend New York City residents wear masks again.
- Hospitals are preparing for an increase in admission due to rising cases and low vaccination rates in New York City.

News organizations use **data visualization** (graphs, charts) to show trends in crime rates, elections, or economic growth.

👗 Fashion Example: Predicting Trends & Consumer Behavior

The fashion industry relies on data to **track trends, design clothes, and market products**.

✅ **Data (Raw Facts):**

- Sales numbers: <type of clothing> has increased in sales by <percentage>% this season.
- Celebrity influence: <celebrity> wore <type of clothing> at <event>
- Social media trends: <hashtag> has over <number> posts on <social media platform>

✅ **Information (Interpreted Data):**

- <type of clothing> is trending in <season><year> due to celebrity endorsements
- <hashtag> is trending in <population>

✅ **Knowledge (Predictions & Strategy):**

- Brands should focus on <hashtag> themed collections to attract <population> that uses <social media platform>
- Stores should stock more <type of clothing> to meet demand

Fashion retailers (like Zara or H&M) use **AI-powered recommendation systems** to **predict what customers will buy next** based on past purchases.

CODE Relevance

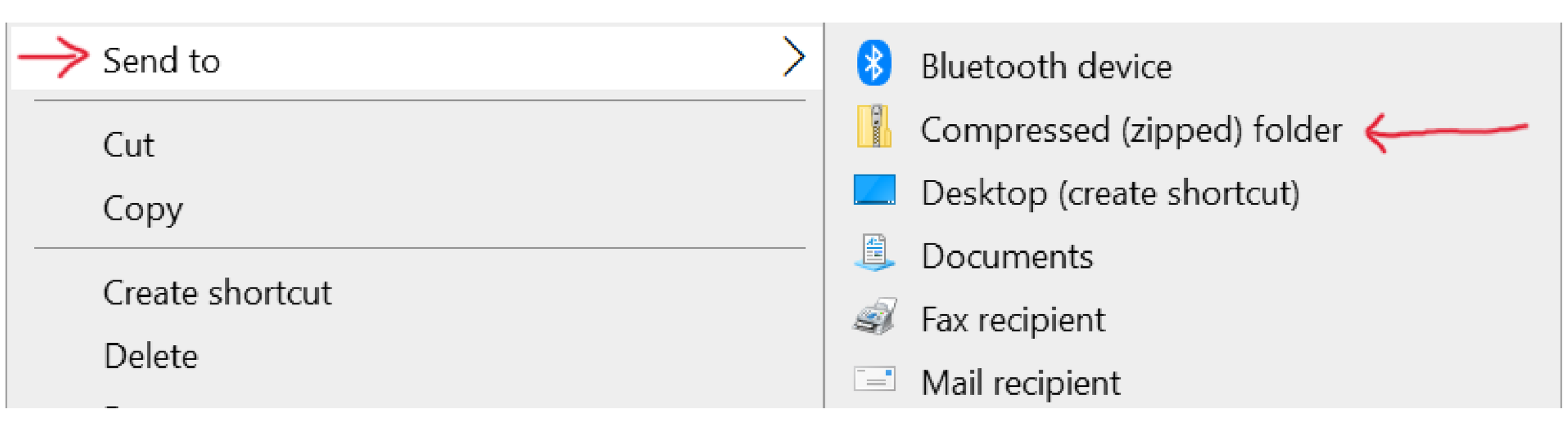
For both journalism and fashion, **software can process and analyze large amounts of data**, turning it into useful insights.

📋 Assignment Instructions

1. Choose **raw data** related to your career.
2. Determine how that **raw data** could be converted into **information**, and how logic could be applied to the information to generate **knowledge**.
3. Create a simple JavaScript application to demonstrate your ideas. You can use a generator, open source, or friends to help you with code, but be sure to **credit any code you did not personally create**.
4. Take two screenshots of your application running. Include the screenshots in your folder with your project.
5. Include credits at the top of your code with the project title, your name, and the date.
6. Include credits in your main code file for any code that you did not completely author on your own, or for any help you received from others while making the project.
7. Fill out the documentation.

Submission

Create a folder with your project inside. Zip up the folder and submit it here.



	File Name	Size	
	image_202...00538.png	139 KB	✔
	script.js	854 Bytes	✔
	Screensho...95615.png	159 KB	✔