AP CSPTopic 2.3: Extracting Information from Data

Big Idea 2 — Data

Programs can process data to help us discover information and create new knowledge.

Part A — Understanding Data and Information (10 pts)

1- What is the difference between **data** and **information**?

Data is raw facts, while information is processed data that has meaning..

2- Give one example of **data** and the **information** you could find from it.

Example: Data → "3, 5, 7." Information → "The numbers are odd."

Data→"2,4,6." İnformation→ " The numbers are even"

3- How can computers help us find **patterns or trends** in data?

Computers find patterns in data by quickly comparing and analyzing large amounts of information.

4- What does **correlation** mean?

Correlation is how two things are related or change together..

5- Why is it important to remember that "correlation does not mean causation"?

Because just because two things happen together doesn't mean one causes the other.

Part B — Metadata (10 pts)

6- What is **metadata**?

Metadata is data that describes other data.

7- Give two examples of metadata that an image might include.

Date taken and camera settings.

Look at two images:

- Image A = 3.2 MB
- Image B = 400 KB
  Which one is more compressed? How can you tell?

  Image B is more compressed because its file size is smaller.

9- Does changing metadata (like file name or date) change the image itself? Explain.

No, it only changes info, not the image.

10- How can metadata help a photo app organize your pictures automatically?

Metadata like date, location, or camera type lets a photo app sort and group pictures automatically.

Part C — Processing and Cleaning Data (10 pts)

1- What problems might happen if your data includes missing or repeated values?

It can give wrong results.

2- What does it mean to **clean data**?

Fix or remove errors in data.

3- Why is cleaning data important before analyzing it?

To get accurate analysis.

Part D — Bias, Scale, and System Limits (10 pts)

4- Why can big data sets be hard for one computer to process?

Too much data can slow down or exceed a computer's memory.

5- Give one example of how data collection could create **bias**.

If a survey only asks one group of people, results may be biased.

Part E — Reflection (10 pts)

6- What was the most interesting thing you learned about data or metadata?

Metadata shows hidden info about files.

7- Why is data cleaning important for getting accurate results?

It removes errors for correct results.

8- How can metadata help us organize digital information?

It sorts and groups files automatically.

9- What’s one example of bias that could happen in real life?

A survey that ignores some people.

10-How does processing data help humans make better decisions?

ıt reveals patterns to guide choices.