

## SCO 405: COMPRESSION TECHNIQUES

### CAT 1 Practical

#### Instructions:

- Attempt all questions.
- Provide screenshots, calculations, and brief explanations where required.
- Use any available software tools such as file compression utilities (e.g., ZIP tools), audio/image editors, or media players.
- **To be done in groups of 3 students**
- **Send your answers to [murava.catherine@ku.ac.ke](mailto:murava.catherine@ku.ac.ke) on or before 17/4/26**

#### Question 1: Lossless Compression Using File Archiving (10 Marks)

You are provided with a text document or a folder containing notes.

#### Tasks:

- a) Compress the file using a lossless compression tool (e.g., ZIP or 7-Zip). (3 marks)
- b) Record the original and compressed file sizes. (2 marks)
- c) Calculate the **compression ratio** using the formula:

$$\text{Compression Ratio} = \frac{\text{Original Size}}{\text{Compressed Size}}$$

(3 marks)

- d) Decompress the file and verify its integrity. State whether any data was lost. (2 marks)

#### Expected Outcome:

- Demonstrates understanding of lossless compression and compression efficiency.

#### Question 2: Image Compression – Lossy vs Lossless (10 Marks)

Use an image editing tool such as Paint, GIMP, Photoshop, or an online editor.

#### Tasks:

- a) Save the same image in PNG format and JPEG format. (4 marks)
- b) Record the file sizes of each format. (2 marks)

c) Compare the image quality and identify which format uses lossy or lossless compression. (2 marks)

d) Recommend the most suitable format for:

- Web publishing
  - Archival storage
- Provide reasons. (2 marks)

**Expected Outcome:**

- Demonstrates understanding of lossy vs lossless compression and the trade-off between quality and storage.

**Question 3: Audio/Video Compression and Performance Analysis (10 Marks)**

Use an audio or video file and a media conversion tool such as VLC Media Player, Audacity, or HandBrake.

**Tasks:**

a) Convert an uncompressed or large media file into a compressed format (e.g., WAV to MP3 or MP4). (3 marks)

b) Record the original and compressed file sizes. (2 marks)

c) Calculate the compression factor:

$$\text{Compression Factor} = \frac{\text{Original Size}}{\text{Compressed Size}}$$

(2 marks)

d) Comment on:

- Quality after compression
  - Suitability for real-time streaming
  - Speed (timing) of compression
- (3 marks)

**Expected Outcome:**

- Demonstrates knowledge of audio/video compression, performance considerations, and real-world applications.