

BCM SCHOOL, BASANT AVENUE, DUGRI ROAD, LUDHIANA

ANSWER KEY – ASSIGNMENT 2

Class X – Artificial Intelligence (417)

Chapter: Computer Vision

1. Fill in the blanks.

a) Computer Vision enables computers to understand and analyze _____.

Answer: images / visual data.

b) Face recognition is an application of _____.

Answer: Computer Vision.

c) CNN stands for _____.

Answer: Convolutional Neural Network.

d) The process of applying a filter to an image is called _____.

Answer: Convolution.

2. State whether the following statements are True or False.

a) Computer Vision allows machines to interpret visual data. _____

Answer: True.

b) Self-driving cars do not use Computer Vision. _____

Answer: False.

c) Convolution helps in extracting image features. _____

Answer: True.

d) Medical image analysis is an application of Computer Vision. _____

Answer: True.

3. Match the following.

Answer: Face Recognition → Security Systems.

Answer: Self-driving Cars → Transportation.

Answer: MRI Scan Analysis → Healthcare.



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Answer: Image Classification → Computer Vision Task.

4. A school wants to develop an AI system that identifies students from photographs.

a) Which AI domain will be used?

Answer: Computer Vision.

b) Name one Computer Vision task involved.

Answer: Face Recognition.

c) Mention one advantage of this system.

Answer: It can identify/verify students quickly and automatically.

5. Differentiate between Human Vision and Computer Vision (any two points).

Answer: Human Vision: Humans see and interpret visual information using their eyes and brain. It uses human perception, experience and understanding.

Answer: Computer Vision: Computers interpret visual data using cameras, image processing and AI algorithms.

Answer: Human Vision can understand context and apply common sense naturally, whereas Computer Vision depends on the data and models used for training.

6. Name any four real-life applications of Computer Vision.

Answer: Face Recognition.

Answer: Self-driving Cars.

Answer: Medical Image Analysis.

Answer: Traffic Monitoring and Management.

7. Case Study – A smart city plans to install cameras at traffic signals to detect traffic violations, count vehicles and identify accidents automatically.

a) Which AI domain will make this system possible?

Answer: Computer Vision.

b) Name any two Computer Vision tasks used in this system.

Answer: Object Detection and Image Classification. Vehicle detection, accident detection or image segmentation may also be used where appropriate.

c) Explain how Computer Vision can improve traffic management.

Answer: Computer Vision can automatically monitor traffic, detect violations, count vehicles and identify accidents. This helps authorities manage traffic efficiently and respond quickly to incidents.

8. A hospital wants to use AI to analyze X-ray images and detect diseases.

a) Explain how Computer Vision can help doctors.

Answer: It can analyze X-ray images, identify visual patterns or abnormalities and assist doctors in detecting diseases.

b) Which image features may be important for disease detection?

Answer: Edges, shapes, textures, patterns, brightness/intensity and other visible abnormalities may be important.

c) Mention two benefits and one limitation of such systems.

Answer: Benefits: faster analysis and assistance in early/accurate detection. Limitation: AI systems can make errors and should support, not replace, professional medical judgment.

9. Compare Human Vision and Computer Vision on the basis of Processing, Accuracy, Speed and Decision-making.

Answer: Processing: Human vision is processed by the eyes and brain; Computer Vision processes images using algorithms and AI models.

Answer: Accuracy: Humans can use context and experience; computer accuracy depends on the quality of data, training and algorithms.

Answer: Speed: Computers can process large numbers of images very quickly; humans are slower for large-scale repetitive analysis.

Answer: Decision-making: Humans can use common sense and contextual understanding; computer decisions are based mainly on learned patterns and trained models.

10. Explain the following terms with suitable examples:

a) Image Classification

Answer: Image Classification: Assigning an image to a category. Example: classifying an image as a cat or dog.

b) Object Detection

Answer: Object Detection: Identifying objects and their locations in an image. Example: detecting cars and pedestrians in a road image.

c) Image Segmentation

Answer: Image Segmentation: Dividing an image into meaningful regions or pixels.
Example: separating a tumour region from healthy tissue in a medical image.

d) Face Recognition

Answer: Face Recognition: Identifying or verifying a person using facial features. Example: unlocking a phone using the user's face.

11. A security company is developing an AI system that can recognize employees and allow entry only to authorized people.

a) Which Computer Vision task is being used?

Answer: Face Recognition.

b) Explain the role of Convolution in this system.

Answer: Convolution applies filters to an image to detect important features such as edges, shapes and facial patterns.

c) How do Convolutional Neural Networks (CNNs) improve image recognition?

Answer: CNNs automatically learn useful image features through convolutional layers and use these features to recognize and classify faces/images effectively.

12. A farmer wants to use drones to monitor crops and detect diseases in plants.

a) Explain how Computer Vision can help the farmer.

Answer: Computer Vision can analyze drone images to monitor crop health and identify visible signs of disease or stress.

b) Which Computer Vision tasks will be used?

Answer: Image Classification and Object Detection. Image Segmentation may also be used to locate affected areas.

c) Mention two advantages of using AI in agriculture.

Answer: Early detection of crop diseases and faster, more efficient monitoring of large fields.

13. “Computer Vision is transforming healthcare, education and transportation.” Justify the statement with suitable examples from daily life.

Answer: Computer Vision is transforming these areas by enabling machines to interpret images and videos. In healthcare, it assists in analyzing X-rays and other medical images. In education, it can support attendance and student identification through face recognition. In transportation, it is used in self-driving vehicles, traffic monitoring, vehicle counting and accident detection.