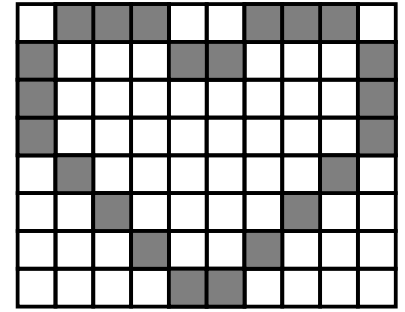


Unit 2 and 3: Quiz 2

1. Image processing is a very important application of computers.

a) For the image to the right, each box represents a pixel. Use this image to answer the following three questions.



i) What is the aspect ratio of the image? (2)

10 : 8 or 5 : 4

ii) What is the resolution of the image, in pixels? (2)

10 × 8 pixels

iii) A run-length encoding algorithm uses:

- W for white pixels
- B for black (gray) pixels

Give the results of compressing the first 3 lines of the image using the algorithm. (3)

Line 1 **1W 3B 2W 3B 1W**

Line 2 **1B 3W 2B 3W 1B**

Line 3 **1B 8W 1B**

b) Images can be stored in different formats.

i) What main advantage does a vector graphics format have over raster a format format for storing digital images? (2)

Vector graphics images maintain smooth lines when scaled up.

(small file sizes, easily editable, editable with a text editor)

ii) State whether a **raster** format or a **vector** graphics format is better suited for each type of image in the table. (2)

photographic image	raster
company logo	vector
flowchart diagram	vector
scanned image of a painting	raster

c) An old 720p resolution television screen has a width of 1280 pixels and a height of 720 pixels. Given a bitmap image with the same resolution, and a color depth of 24 bits, construct an expression to show how the image size, in bytes, is calculated. Use dimensional analysis. Do **not** calculate the answer. (3)

$$(1280 \times 720_{\text{pixel}}) \times \frac{24 \text{ bit}}{\text{pixel}} \times \frac{1 \text{ byte}}{8 \text{ bit}}$$

(2,764,800 bytes)

+1 multiply dimensions; +1 bits/pixel +1 byte/bit; –1 other components

d) What is the minimum color depth for an uncompressed bitmap image that contains 50 different colors? (1)

$2^5 = 32$; $2^6 = 64$; so for 50 different values, it requires: 6 bits

Unit 2 and 3: Quiz 2

2. Write the Java code that implements a partial **Book** class (don't worry that it is incomplete) that contains the following:

- a private instance field named `title` that can store a string
- a private instance field named `year` that can store an integer
- a public constructor that takes two parameters and uses these parameters to initialize the two fields of the class
- an accessor and a mutator method for the `title` field.

Book
-title: String -year: Integer
+Book(title: String year: Integer) +setTitle(title String) +getTitle():String

Write your code in the space below.

(10)

```
public class Book {  
    private String title;  
    private int year;  
    public Book(String title, int year) {  
        this.title = title;  
        this.year = year;  
    }  
    public void setTitle(String title) {  
        this.title = title;  
    }  
    public String getTitle() {  
        return title;  
    }  
}
```