

Year 10 Interleaved Homework 19

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1. Code Logic Questions

```
a = 20
b = 8
if a >= 25 and b == 8:
    x = 'a'
else:
    x = 'b'
```

State the value of x: "b"

```
a = 65
b = 82
if a > b or b >= 83:
    x = 10
else:
    x = 20
```

State the value of x: 20

```
a = 98
b = 99
if not(a == b) or b < 99:
    x = "Approved"
else:
    x = "Denied"
```

State the value of x: "Approved"

```
a = 20
b = 50
c = 197
if not(c < a + b) and b < c - a:
    x = True
else:
    x = False
```

State the value of x: True

2. Boolean Logic

You are developing a security system for a building. The system should grant access under one of two conditions:

- if the person has a valid access card
- if they are on the approved visitor list for the day

Write an IF statement using and, or, or not that performs the same function as:

```
if has_access_card == True:
    if on_visitor_list == True:
        grant_access = True
    else:
        grant_access = False
```

Equivalent single IF statement:

`if has_access_card and on_visitor_list`

3. Loop Conversion

Convert the following FOR loop into a WHILE loop:

```
counter = 1
while counter < 15:
    print(counter)
    counter = counter + 2
```

```
for i in range(1, 15, 2):
    print(i)
```

4. Compression

State two reasons why data gets compressed:

1. Save storage
2. Easier to share

5. File Size Calculation

Calculate the minimum file size in bytes of a 10 pixel by 10 pixel image with 12 different colours.

Show all your working:

12 colours = 4 bits

$10 \times 10 \times 4 = 100 \times 4 = 400$

$400 / 8 = 50$ Bytes

6. Conversions Table

Fill in the missing values:

Decimal	Binary	Hexadecimal
65	01000001	0x41
174	10101110	0xAE
114	01110011	72

7. Unicode Storage

How many Bytes will it take to store the word "Huffman" in 16-bit Unicode?

$\text{Len}(\text{"Huffman"}) = 7$

$7 \times 8 = 56$

$56 \times 2 = 112$

8. Sound File Size Algorithm (Pseudocode Completion)

Use the terms from **Figure 1** to fill in the gaps in **Figure 2**.

Figure 1 Keywords:

bit, Byte, getSize, print, rate, res, return, sampRate, seconds, size, size + 8, size * 8, size / 8, size MOD 8, SUBROUTINE, input

Figure 2

```
def getSize(sampRate, res, seconds):  
    size = sampRate * res * seconds  
    size = size / 8  
    return size
```

```
# Main Program  
print(getSize(100, 16, 60))
```