10/24/25, 5:00 PM Homework 1

#### Homework 1

COMPSCI 101, Duke Kunshan University

Name:

NetID:

```
In [1]: # Put your answer in here for easier grading

# Q1, ans =11001.11101

# Q2, ans =110010

# Q3 (1), ans =6635520000

# Q3 (2), ans =10616.832

# Q4, ans =55.625
```

# **Q1 (10 points)**

Convert the decimal fraction 25.90625 to a binary

```
In [2]: #Please place your final answer in the first cell at the very top and clearly show all calculation steps be
        25.90625*2=51.8125
        51.8125*2=103.625
        103.625*2=207.25
        207.25*4=829
        total:2^5
        (829)10=(1100111101)2
        414 1
207 0
        103 1
        51
            1
        25
             1
        12
              0
              0
        so:1100111101/100000=11001.11101
```

# Q2 (10 points)

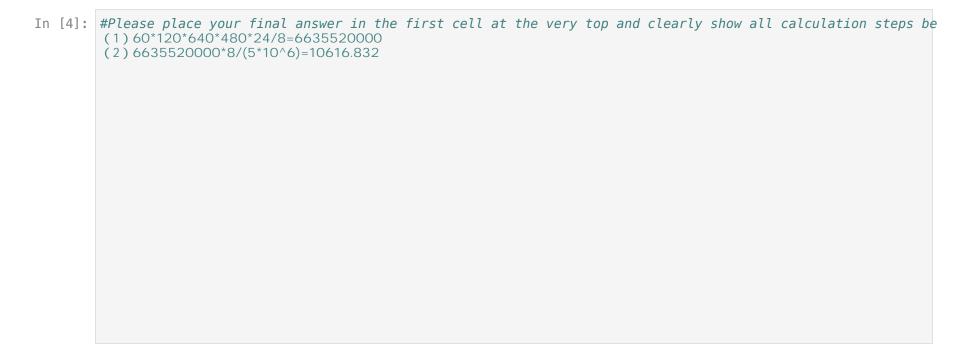
Calculate the result of 01101001 – 00110111

```
In [3]: #Please place your final answer in the first cell at the very top and clearly show all calculation steps be 01101001 -00110111 110010 test:110010+110111=1101001
```

10/24/25, 5:00 PM Homework 1

### **Q3** (10 points)

- (1) Calculate the file size (in Bytes!) of a 2-minute video recorded at 60 frames per second, where each frame has a resolution of  $640 \times 480$  pixels, and each pixel contains 24 bits (RGB) of color information. Your answer should be in Bytes.\_
- (2) How long does it take to transmit this video with a transmission speed of 5 Mbps? Your answer should be in seconds.



# Q4 (10 points)

Convert the binary number 11011.1101 to its decimal equivalent.

