# QUESTIONS

Q.1
[Part 1]

Bit rate = Number of pixels per second * bits per pixel

Bits per pixel = for every 4 pixels there are 4 samples of luminance and 2 samples of chrominance. So (4*8 + 2*8)/4 = 12 bits per pixel

# of pixels per second = 450 lines * 520 pixels per line * 25 Hz = 5850000

**Bit rate = 70200000 bits/second or 70.2 Mbps**

[Part 2]
With 6 bits per sample of chrominance the bits per pixel is now (4*8 + 2*6)/4 = 11

Bit rate = 64.35 Mbps

**Storage size = Bit rate * 60 seconds * 10 minutes = 38610 Mb or 38.61 Gb**

Q.2
[Part 1]
((Input + 4)/8) * 32 Will translate interval into domain of [0, 32]
Round answer to nearest integer

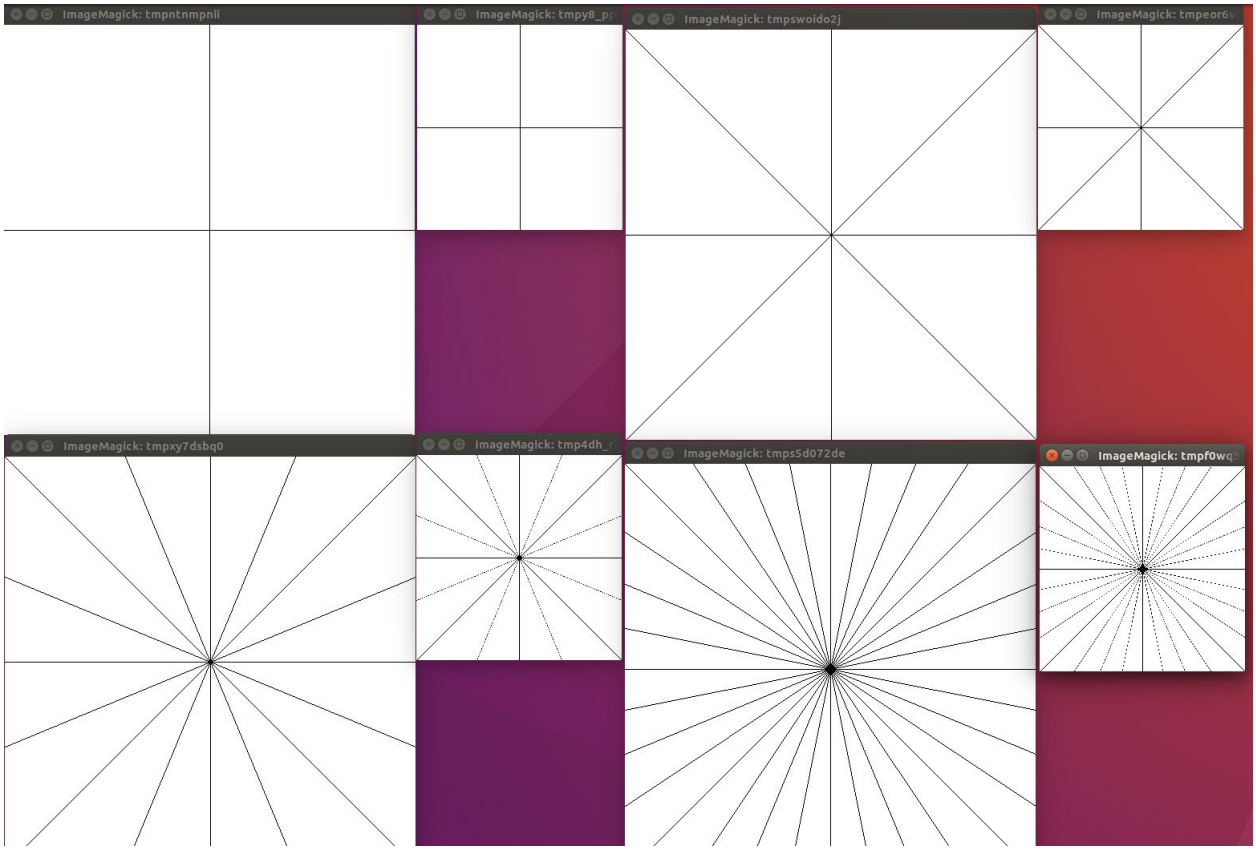
**23, 25, 25, 29, 29, 29, 26, 27, 27, 27, 22, 20, 21, 21, 23, 25, 25, 25, 24, 25, 21, 17, 11, 11, 9, 12, 7, 10, 10, 13, 16, 20**

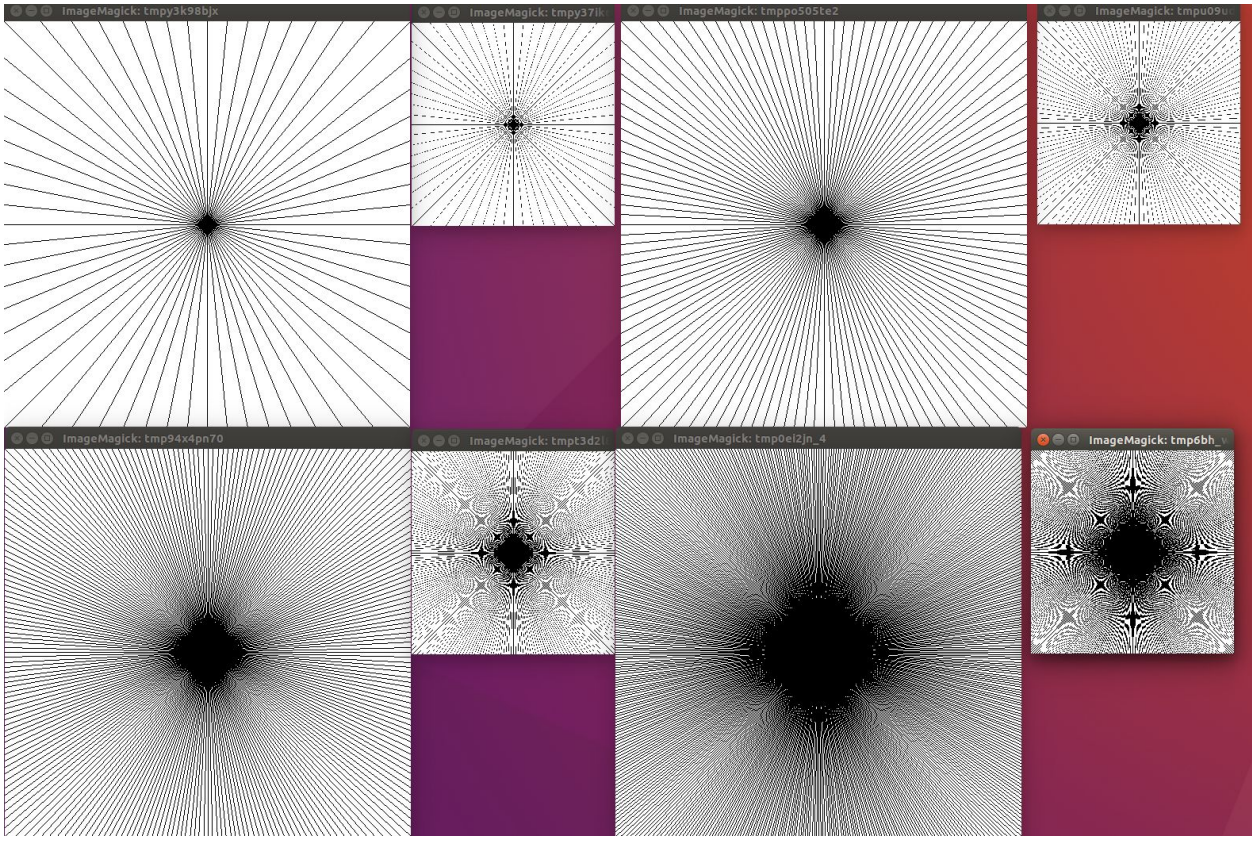
[Part 2]
Each number requires 5 bits to represent an interval of 32
There are 32 values.
**Therefore 5 * 32 = 160 bits to transmit this sequence**

## Part 1 Analysis

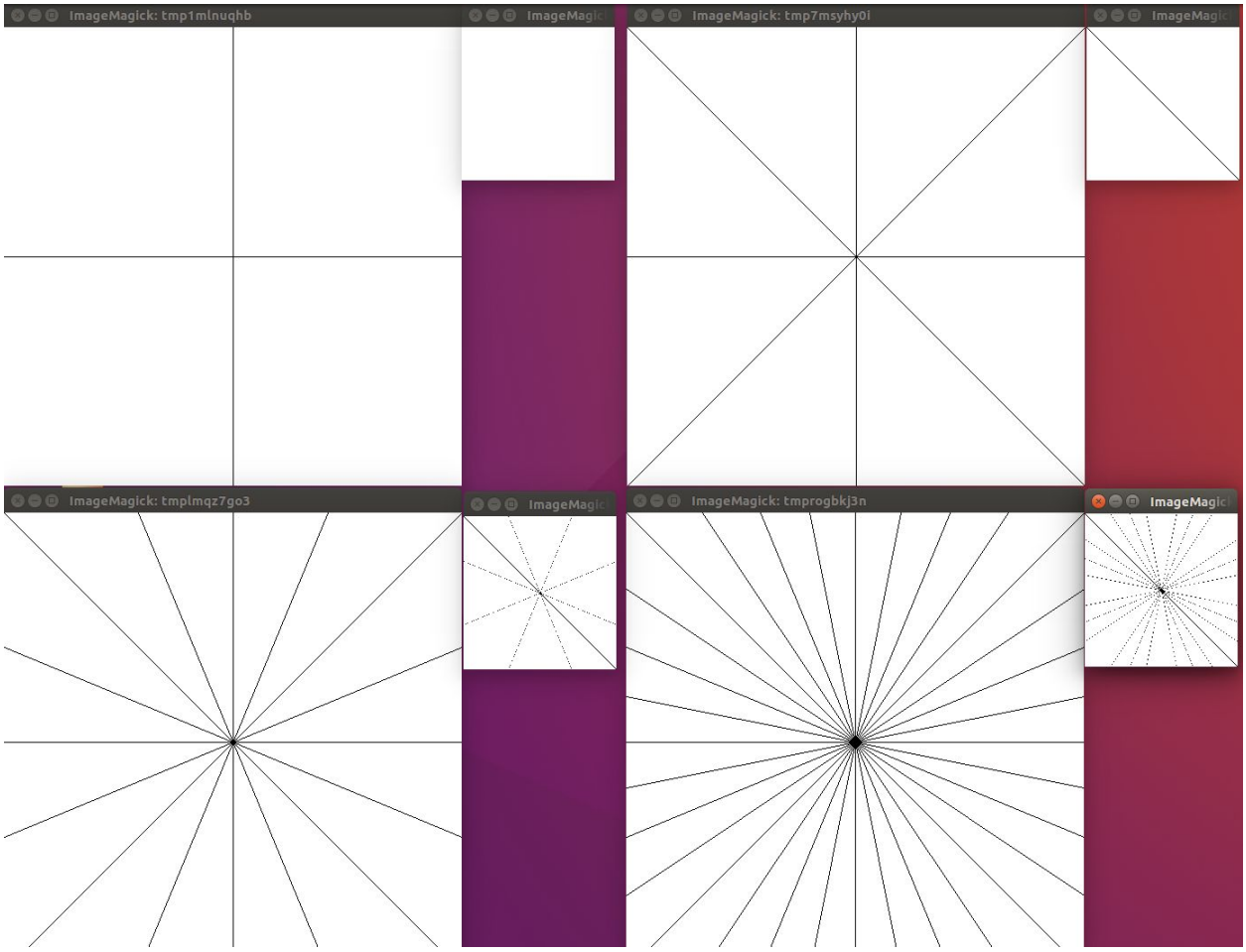
1. These first few pictures are results from when the scaling factor is constant and the number of lines is allowed to increase.

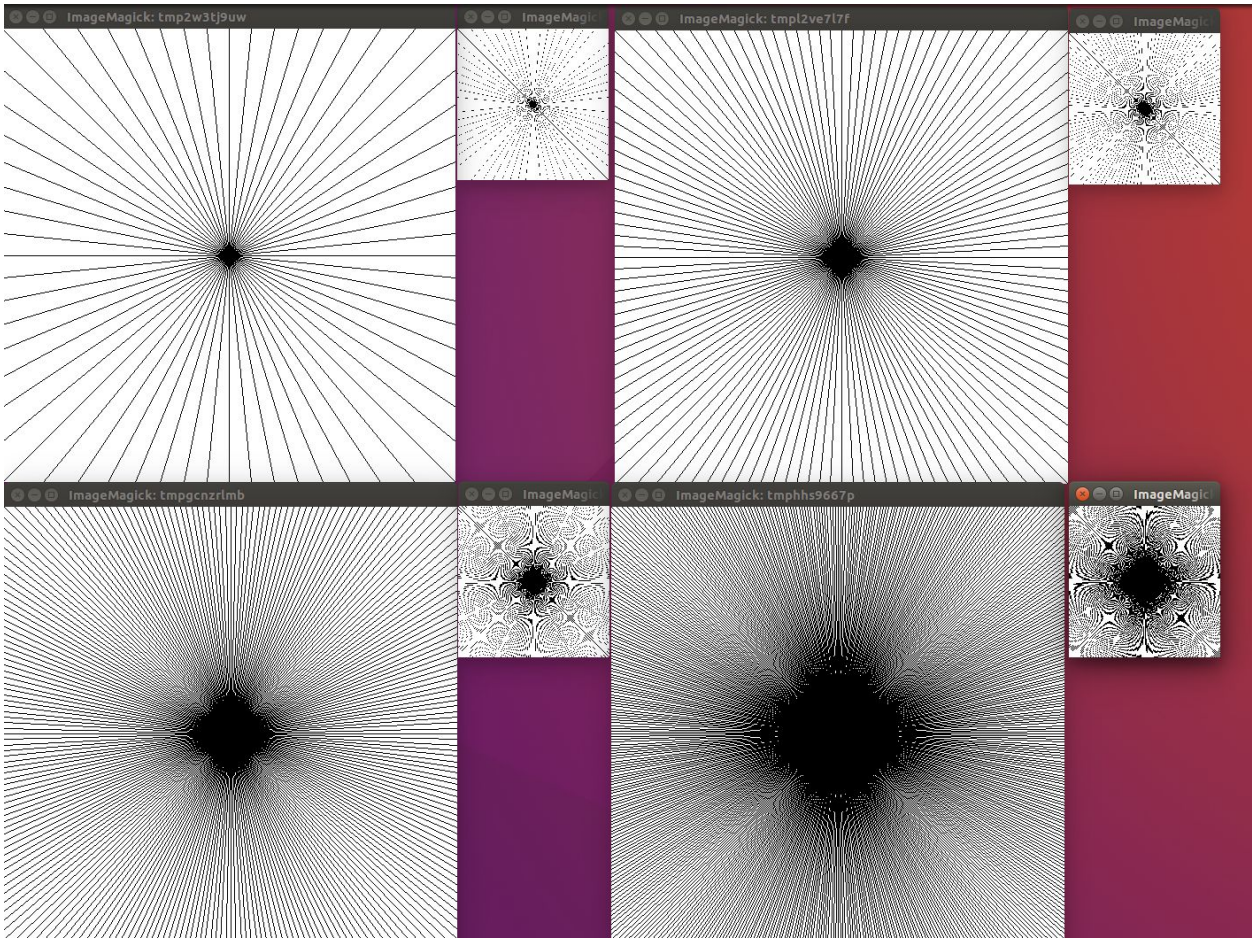
With 2.0 scaling:




ImageMagick: tmpy3k98bjx
ImageMagick: tmppo505te2
ImageMagick: tmp94x4pn70
ImageMagick: tmp0el2jn_4
ImageMagick: tmp6bh_

With scale 3:

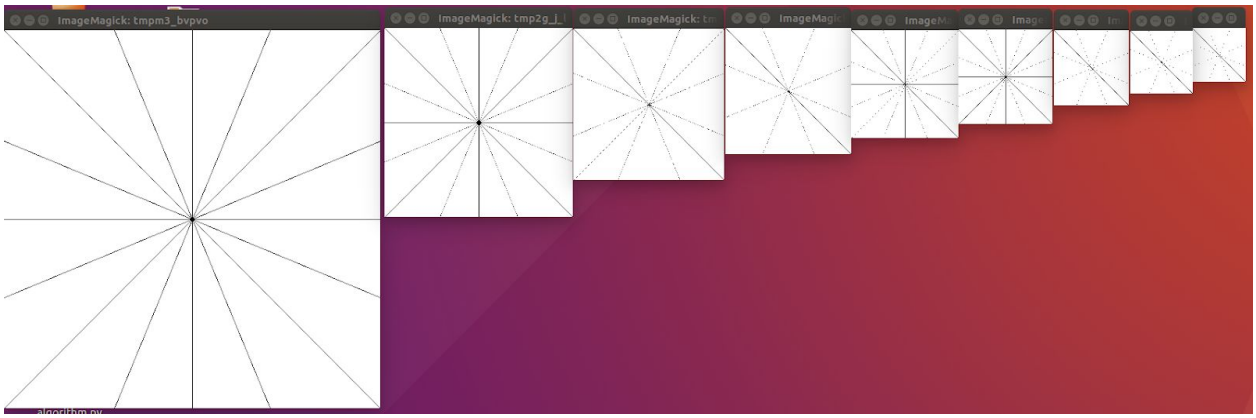

ImageMagick: tmp1mlnuqhb
ImageMagick: tmp7msyhy0i
ImageMagick: tmplmqz7go3
ImageMagick: tmprogbkj3n



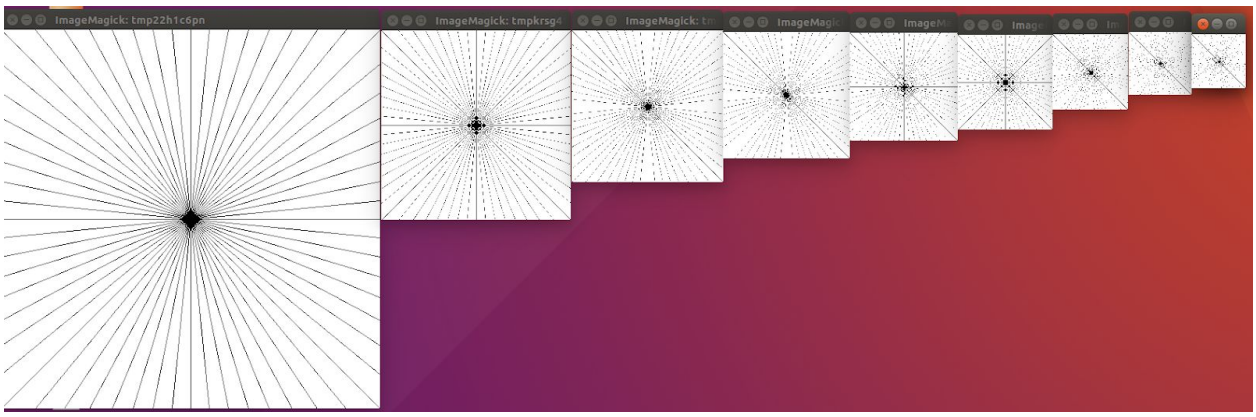

From these pictures I would say that the aliasing definitely becomes more noticeable as the frequency of the images increases

2. The next few pictures show the aliasing effect when the number of lines is kept constant but the scale factor changes.

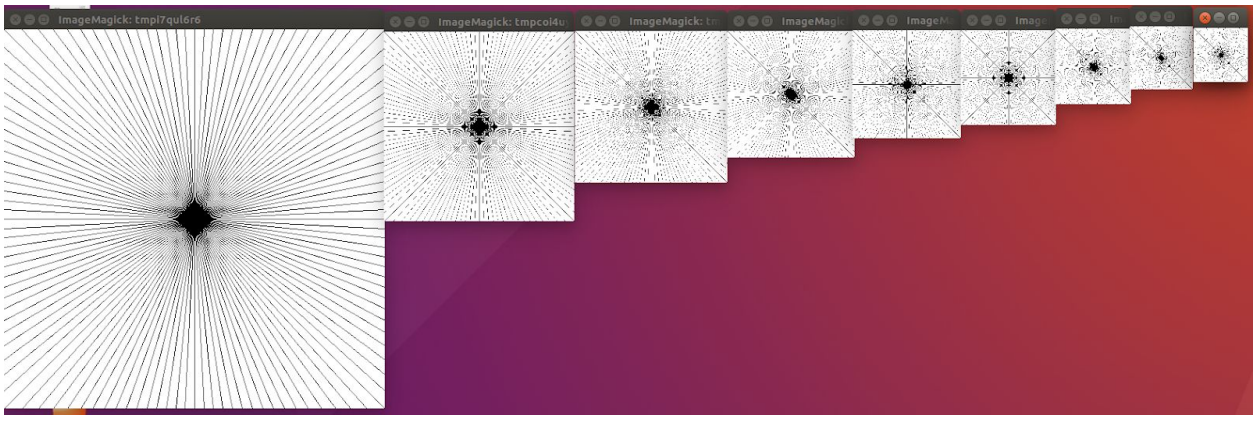
With 16 lines:




With 64 lines:




With 128 lines:




From these images it can be concluded that the aliasing effects become more noticeable as the scale factor increases.

## Part 2 Analysis

Formula for observed speed of rotation (os) using speed of rotation (s) and fps

os = ((s / fps) % 1) * fps

So if s = 10 and …

2. Fps = 25, os = 10

3. Fps = 16, os = 10

4. Fps = 10, os = 0

5. Fps = 8, os = 2