# Computer Vision Hw #6

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## Homework Description

- Count the Yokoi connectivity number on a downsampled lena using 4-connected. Result of this assignment is a 64x64 matrix.

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- **Downsampling**

Simply run some loops

```python
def Downsampling(arr):
    new = np.zeros((64,64))
    for i in range(64):
        for j in range(64):
            new[i][j] = arr[i*8][j*8]
    output = Image.fromarray(new)
    output = output.convert("L")
    output.save("downsample.bmp")
    return new
```



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- **Yokoi connectivity number**

```python
def process(res):
    tot = res[1] + res[3] + res[5] + res[7]
    for k in range(4):
        if (res[k*2] and res[k*2 + 1] and res[k*2-1]):
            tot -= 1
    return tot

def count(arr):
    seq = [(-1, -1),(-1, 0),(-1, 1),(0, 1),(1, 1),(1, 0),(1, -1),(0, -1)]
    ret = np.zeros((64,64))
    for i in range(64):
        for j in range(64):
            if (arr[i][j] == 0):
```

```
            ret[i][j] = -1
            continue
        res = []
        for k in range(8):
            res.append(get(i + seq[k][0], j + seq[k][1], arr))
        if (all(res)):
            ret[i][j] = 5
            continue
        ret[i][j] = process(res)
    return ret
```