```python
In [59]: import numpy as np
```

```python
In [60]: ones_arr = np.ones((5,5))
```

```python
In [61]: ones_arr
```

```
Out[61]: array([[1., 1., 1., 1., 1.],
               [1., 1., 1., 1., 1.],
               [1., 1., 1., 1., 1.],
               [1., 1., 1., 1., 1.],
               [1., 1., 1., 1., 1.]])
```

```python
In [62]: ones_arr = np.ones((5,5),dtype=int)
```

```python
In [63]: ones_arr
```

```
Out[63]: array([[1, 1, 1, 1, 1],
               [1, 1, 1, 1, 1],
               [1, 1, 1, 1, 1],
               [1, 1, 1, 1, 1],
               [1, 1, 1, 1, 1]])
```

```python
In [116…  zeros_arr = np.zeros((3,3), dtype = int)
```

```python
In [117…  zeros_arr
```

```
Out[117…  array([[0, 0, 0],
               [0, 0, 0],
               [0, 0, 0]])
```

```python
In [118…  ones_arr
```

```
Out[118…  array([[1, 1, 1, 1, 1],
               [1, 1, 1, 1, 1],
               [1, 1, 1, 1, 1],
               [1, 1, 1, 1, 1],
               [1, 1, 1, 1, 1]])
```

```python
In [119…  ones_arr * 255
```

```
Out[119…  array([[255, 255, 255, 255, 255],
               [255, 255, 255, 255, 255],
               [255, 255, 255, 255, 255],
               [255, 255, 255, 255, 255],
               [255, 255, 255, 255, 255]])
```

```python
In [120…  zeros_arr
```

```
Out[120…  array([[0, 0, 0],
               [0, 0, 0],
               [0, 0, 0]])
```

```python
In [121…  ones_arr
```

```
Out[121…   array([[1, 1, 1, 1, 1],
                  [1, 1, 1, 1, 1],
                  [1, 1, 1, 1, 1],
                  [1, 1, 1, 1, 1],
                  [1, 1, 1, 1, 1]])
```

In [122…
```python
import matplotlib.pyplot as plt
```

In [123…
```python
%matplotlib inline
```

In [124…
```python
from PIL import Image # python imaging library
```

In [131…
```python
stone_img = Image.open(r'D:\Samson resume\stone_img.jpg')
```

In [132…
```python
stone_img
```

Out[132…

```
In [133…   type(stone_img)
```

```
Out[133…    PIL.JpegImagePlugin.JpegImageFile
```

```
In [134…   stone_arr = np.asarray(stone_img)
           stone_arr
```

```
Out[134...  array([[[240, 200, 141],
                    [240, 200, 141],
                    [240, 200, 141],
                    ...,
                    [220, 208, 168],
                    [223, 211, 171],
                    [202, 190, 150]],

                   [[240, 200, 141],
                    [240, 200, 141],
                    [240, 200, 141],
                    ...,
                    [220, 208, 168],
                    [223, 211, 171],
                    [202, 190, 150]],

                   [[240, 200, 141],
                    [240, 200, 141],
                    [240, 200, 141],
                    ...,
                    [220, 208, 168],
                    [222, 210, 170],
                    [201, 189, 149]],

                   ...,

                   [[ 53,  48,  68],
                    [ 49,  44,  64],
                    [ 49,  45,  62],
                    ...,
                    [101,  82,  84],
                    [105,  89,  90],
                    [131, 115, 116]],

                   [[ 56,  51,  71],
                    [ 62,  58,  75],
                    [ 76,  72,  89],
                    ...,
                    [110,  91,  93],
                    [115,  99, 100],
                    [141, 125, 126]],

                   [[ 94,  90, 107],
                    [102,  98, 115],
                    [117, 113, 130],
                    ...,
                    [117,  98, 102],
                    [125, 109, 112],
                    [151, 135, 138]]], dtype=uint8)
```
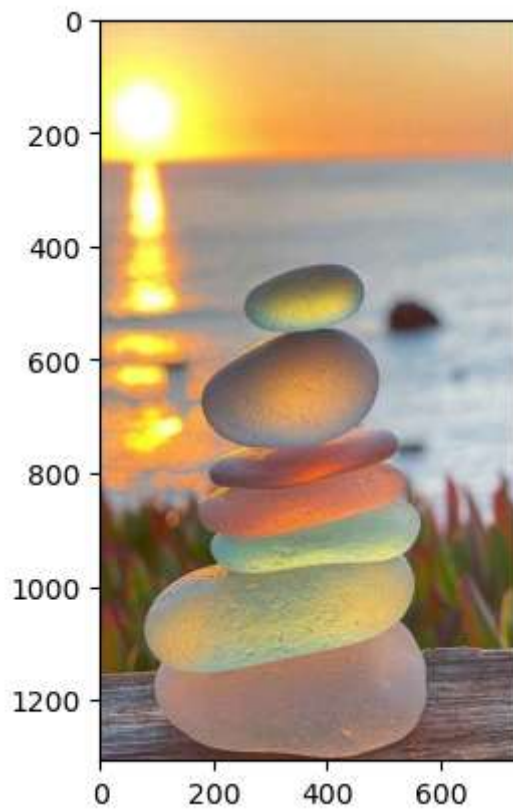
```
In [135...  type(stone_arr)
```

```
Out[135...  numpy.ndarray
```

```
In [136...  stone_arr.shape
```

Out[136…   (1307, 736, 3)

In [137…
```python
plt.imshow(stone_arr)
plt.show()
```


In [138…
```python
stone_red = stone_arr.copy()
stone_red
```

```
Out[138…   array([[[240, 200, 141],
                   [240, 200, 141],
                   [240, 200, 141],
                   ...,
                   [220, 208, 168],
                   [223, 211, 171],
                   [202, 190, 150]],

                  [[240, 200, 141],
                   [240, 200, 141],
                   [240, 200, 141],
                   ...,
                   [220, 208, 168],
                   [223, 211, 171],
                   [202, 190, 150]],

                  [[240, 200, 141],
                   [240, 200, 141],
                   [240, 200, 141],
                   ...,
                   [220, 208, 168],
                   [222, 210, 170],
                   [201, 189, 149]],

                  ...,

                  [[ 53,  48,  68],
                   [ 49,  44,  64],
                   [ 49,  45,  62],
                   ...,
                   [101,  82,  84],
                   [105,  89,  90],
                   [131, 115, 116]],

                  [[ 56,  51,  71],
                   [ 62,  58,  75],
                   [ 76,  72,  89],
                   ...,
                   [110,  91,  93],
                   [115,  99, 100],
                   [141, 125, 126]],

                  [[ 94,  90, 107],
                   [102,  98, 115],
                   [117, 113, 130],
                   ...,
                   [117,  98, 102],
                   [125, 109, 112],
                   [151, 135, 138]]], dtype=uint8)
```

```
In [139…   stone_arr == stone_red
```

```
Out[139…  array([[[ True,   True,   True],
                  [ True,   True,   True],
                  [ True,   True,   True],
                  ...,
                  [ True,   True,   True],
                  [ True,   True,   True],
                  [ True,   True,   True]],

                 [[ True,   True,   True],
                  [ True,   True,   True],
                  [ True,   True,   True],
                  ...,
                  [ True,   True,   True],
                  [ True,   True,   True],
                  [ True,   True,   True]],

                 [[ True,   True,   True],
                  [ True,   True,   True],
                  [ True,   True,   True],
                  ...,
                  [ True,   True,   True],
                  [ True,   True,   True],
                  [ True,   True,   True]],

                 ...,

                 [[ True,   True,   True],
                  [ True,   True,   True],
                  [ True,   True,   True],
                  ...,
                  [ True,   True,   True],
                  [ True,   True,   True],
                  [ True,   True,   True]],

                 [[ True,   True,   True],
                  [ True,   True,   True],
                  [ True,   True,   True],
                  ...,
                  [ True,   True,   True],
                  [ True,   True,   True],
                  [ True,   True,   True]],

                 [[ True,   True,   True],
                  [ True,   True,   True],
                  [ True,   True,   True],
                  ...,
                  [ True,   True,   True],
                  [ True,   True,   True],
                  [ True,   True,   True]]])
```
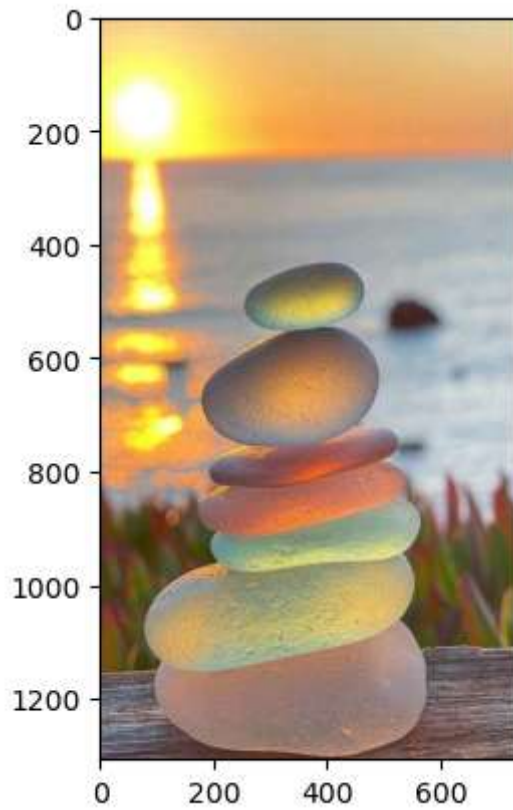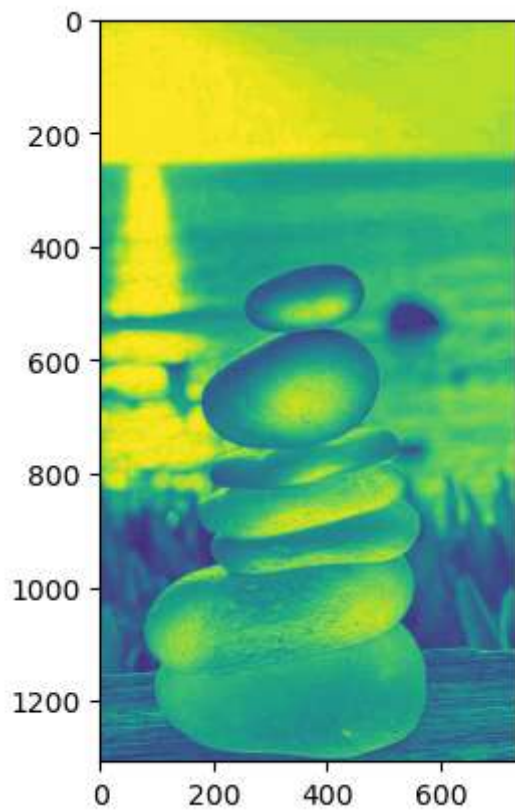
```
In [140…  plt.imshow(stone_red)
          plt.show()
```

In [141...   `stone_red.shape`

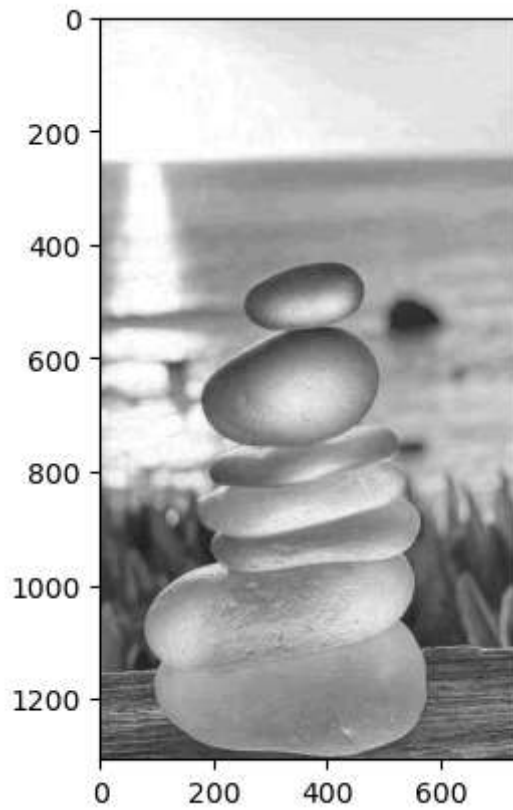Out[141...   (1307, 736, 3)

In [142...
```python
plt.imshow(stone_red[:,:,0]) # R G B
plt.show()
```
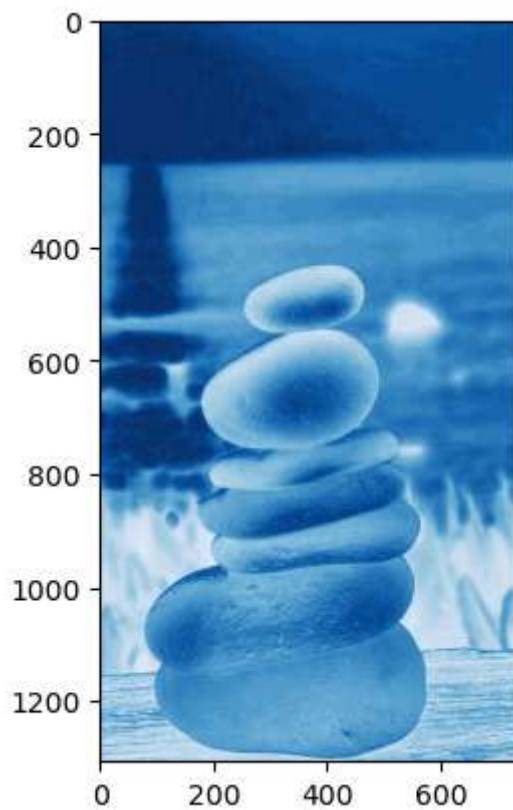
In [143…   `stone_red[:,:,0]`

Out[143…   ```
array([[240, 240, 240, ..., 220, 223, 202],
       [240, 240, 240, ..., 220, 223, 202],
       [240, 240, 240, ..., 220, 222, 201],
       ...,
       [53, 49, 49, ..., 101, 105, 131],
       [56, 62, 76, ..., 110, 115, 141],
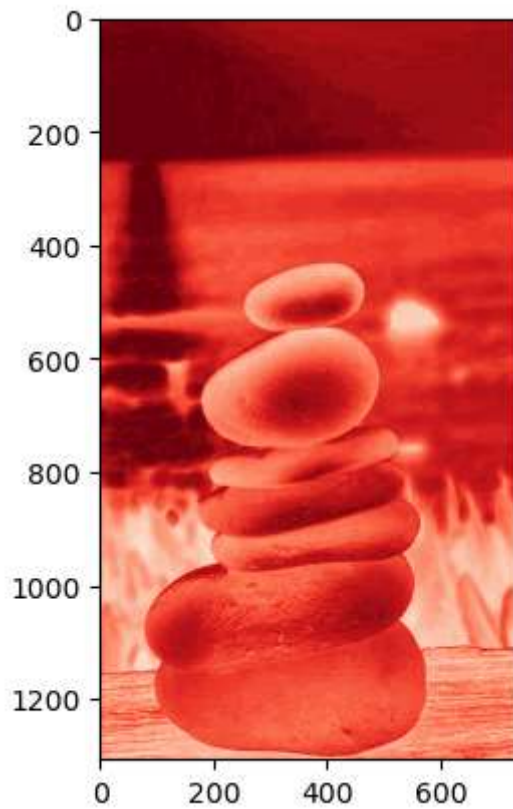   [94, 102, 117, ..., 117, 125, 151]], dtype=uint8)
```

In [144…    ```python
plt.imshow(stone_red[:,:,0], cmap='gray')
plt.show()
```
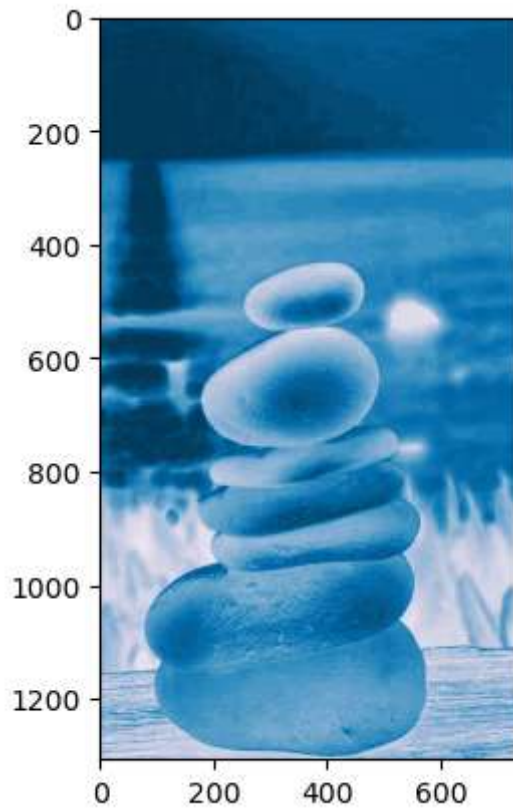
In [145…
```python
plt.imshow(stone_red[:,:,0], cmap='Blues')
plt.show()
```

In [146…
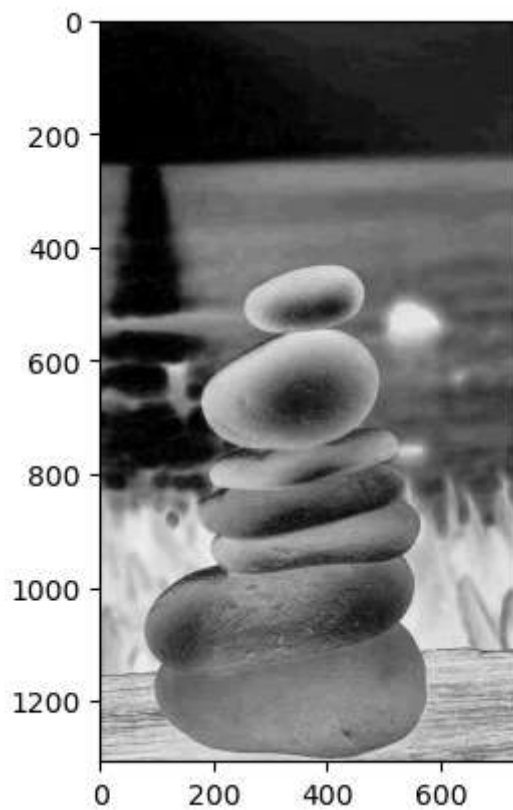```python
plt.imshow(stone_red[:,:,0], cmap='Reds')
plt.show()
```
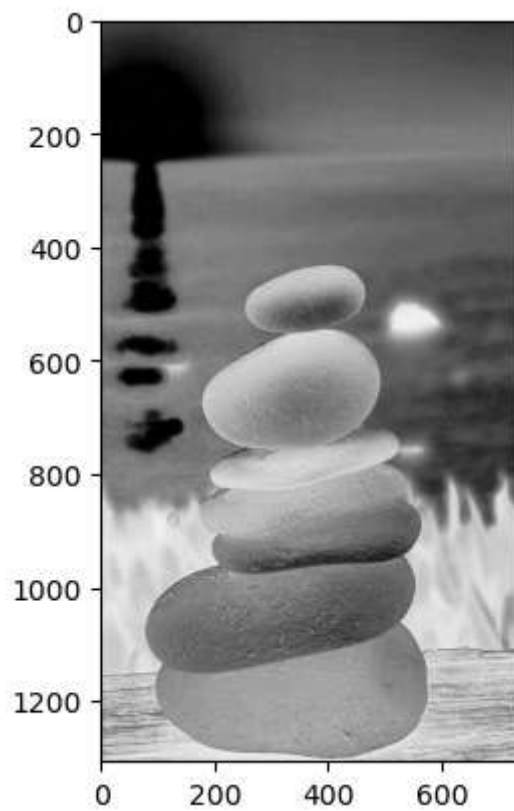


In [147…
```python
plt.imshow(stone_red[:,:,0], cmap='PuBu')
plt.show()
```

In [148…
```python
plt.imshow(stone_red[:,:,0], cmap='Greys')
plt.show()
```
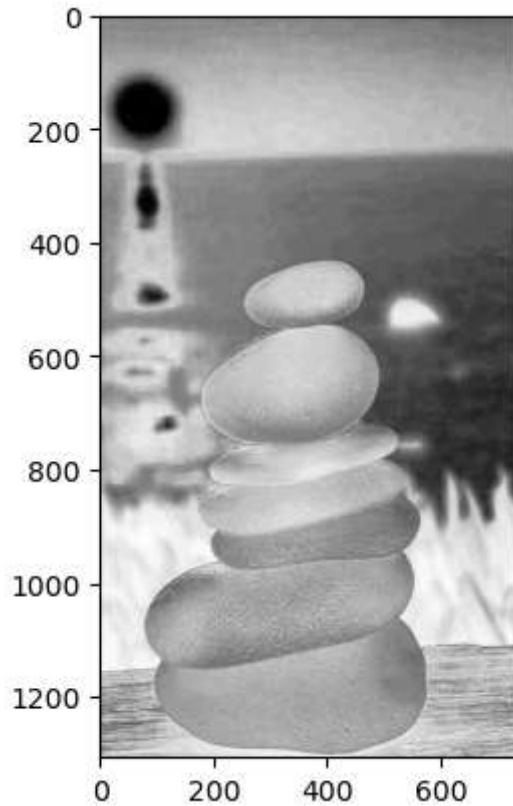
In [149…
```python
plt.imshow(stone_red[:,:,1], cmap='Greys')
plt.show()
```


In [150…
```python
plt.imshow(stone_red[:,:,2], cmap='Greys')
plt.show()
```

In [151…   `stone_red[:,:,0]`

Out[151…   ```
array([[240, 240, 240, ..., 220, 223, 202],
       [240, 240, 240, ..., 220, 223, 202],
       [240, 240, 240, ..., 220, 222, 201],
       ...,
       [53, 49, 49, ..., 101, 105, 131],
       [56, 62, 76, ..., 110, 115, 141],
       [94, 102, 117, ..., 117, 125, 151]], dtype=uint8)
```

In [152…   `stone_red[:,:,1]`

Out[152…   ```
array([[200, 200, 200, ..., 208, 211, 190],
       [200, 200, 200, ..., 208, 211, 190],
       [200, 200, 200, ..., 208, 210, 189],
       ...,
       [48, 44, 45, ..., 82, 89, 115],
       [51, 58, 72, ..., 91, 99, 125],
       [90, 98, 113, ..., 98, 109, 135]], dtype=uint8)
```

In [153…    `stone_red[:,:,2]`

Out[153…   ```
array([[141, 141, 141, ..., 168, 171, 150],
       [141, 141, 141, ..., 168, 171, 150],
       [141, 141, 141, ..., 168, 170, 149],
       ...,
       [ 68,  64,  62, ...,  84,  90, 116],
       [ 71,  75,  89, ...,  93, 100, 126],
       [107, 115, 130, ..., 102, 112, 138]], dtype=uint8)
```

In [154…   ```
           stone_red[:,:,1] = 0
           ```

In [155…   ```
           stone_red[:,:,1]
           ```

Out[155…   ```
           array([[0, 0, 0, ..., 0, 0, 0],
                  [0, 0, 0, ..., 0, 0, 0],
                  [0, 0, 0, ..., 0, 0, 0],
                  ...,
                  [0, 0, 0, ..., 0, 0, 0],
                  [0, 0, 0, ..., 0, 0, 0],
                  [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
           ```

In [156…   ```
           plt.imshow(stone_red)
           plt.show()
           ```


In [157…   ```
           stone_red[:,:,2]
           ```

Out[157…   ```
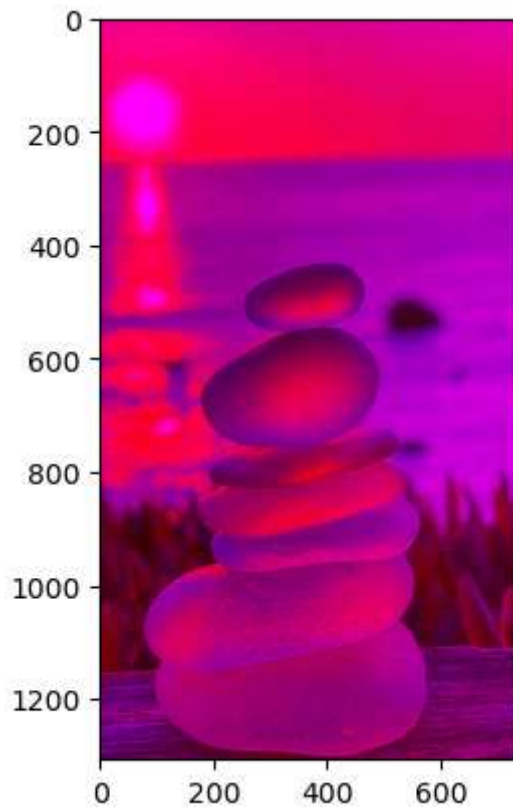           array([[141, 141, 141, ..., 168, 171, 150],
                  [141, 141, 141, ..., 168, 171, 150],
                  [141, 141, 141, ..., 168, 170, 149],
                  ...,
                  [ 68,  64,  62, ...,  84,  90, 116],
                  [ 71,  75,  89, ...,  93, 100, 126],
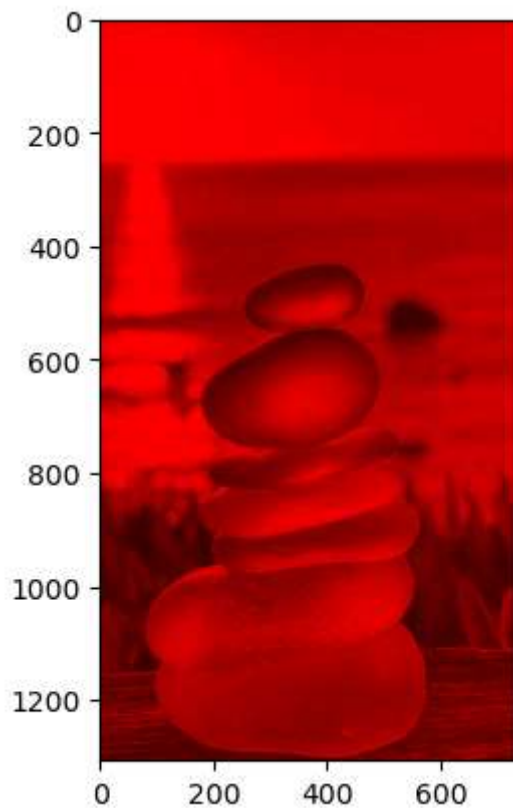                  [107, 115, 130, ..., 102, 112, 138]], dtype=uint8)
           ```

In [158…   ```
           stone_red[:,:,2] = 0
           ```

In [159…   ```
           stone_red[:,:,2]
           ```

```
Out[159…    array([[0, 0, 0, ..., 0, 0, 0],
                   [0, 0, 0, ..., 0, 0, 0],
                   [0, 0, 0, ..., 0, 0, 0],
                   ...,
                   [0, 0, 0, ..., 0, 0, 0],
                   [0, 0, 0, ..., 0, 0, 0],
                   [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

In [160…
```
plt.imshow(stone_red)
plt.show()
```


In [161…
```
stone_arr
```

```
Out[161…   array([[[240, 200, 141],
                  [240, 200, 141],
                  [240, 200, 141],
                  ...,
                  [220, 208, 168],
                  [223, 211, 171],
                  [202, 190, 150]],

                 [[240, 200, 141],
                  [240, 200, 141],
                  [240, 200, 141],
                  ...,
                  [220, 208, 168],
                  [223, 211, 171],
                  [202, 190, 150]],

                 [[240, 200, 141],
                  [240, 200, 141],
                  [240, 200, 141],
                  ...,
                  [220, 208, 168],
                  [222, 210, 170],
                  [201, 189, 149]],

                 ...,

                 [[ 53,  48,  68],
                  [ 49,  44,  64],
                  [ 49,  45,  62],
                  ...,
                  [101,  82,  84],
                  [105,  89,  90],
                  [131, 115, 116]],

                 [[ 56,  51,  71],
                  [ 62,  58,  75],
                  [ 76,  72,  89],
                  ...,
                  [110,  91,  93],
                  [115,  99, 100],
                  [141, 125, 126]],

                 [[ 94,  90, 107],
                  [102,  98, 115],
                  [117, 113, 130],
                  ...,
                  [117,  98, 102],
                  [125, 109, 112],
                  [151, 135, 138]]], dtype=uint8)
```

```
In [162…   stone_red
```

```
Out[162…   array([[[240,    0,    0],
                   [240,    0,    0],
                   [240,    0,    0],
                   ...,
                   [220,    0,    0],
                   [223,    0,    0],
                   [202,    0,    0]],

                  [[240,    0,    0],
                   [240,    0,    0],
                   [240,    0,    0],
                   ...,
                   [220,    0,    0],
                   [223,    0,    0],
                   [202,    0,    0]],

                  [[240,    0,    0],
                   [240,    0,    0],
                   [240,    0,    0],
                   ...,
                   [220,    0,    0],
                   [222,    0,    0],
                   [201,    0,    0]],

                  ...,

                  [[ 53,    0,    0],
                   [ 49,    0,    0],
                   [ 49,    0,    0],
                   ...,
                   [101,    0,    0],
                   [105,    0,    0],
                   [131,    0,    0]],

                  [[ 56,    0,    0],
                   [ 62,    0,    0],
                   [ 76,    0,    0],
                   ...,
                   [110,    0,    0],
                   [115,    0,    0],
                   [141,    0,    0]],

                  [[ 94,    0,    0],
                   [102,    0,    0],
                   [117,    0,    0],
                   ...,
                   [117,    0,    0],
                   [125,    0,    0],
                   [151,    0,    0]]], dtype=uint8)
```

```
In [163…   stone_img
```

Out[163…

In [164… | `arr1 = np.asarray(stone_img)`

In [165… | `arr1`

```
Out[165…   array([[[240, 200, 141],
                   [240, 200, 141],
                   [240, 200, 141],
                   ...,
                   [220, 208, 168],
                   [223, 211, 171],
                   [202, 190, 150]],

                  [[240, 200, 141],
                   [240, 200, 141],
                   [240, 200, 141],
                   ...,
                   [220, 208, 168],
                   [223, 211, 171],
                   [202, 190, 150]],

                  [[240, 200, 141],
                   [240, 200, 141],
                   [240, 200, 141],
                   ...,
                   [220, 208, 168],
                   [222, 210, 170],
                   [201, 189, 149]],

                  ...,

                  [[ 53,  48,  68],
                   [ 49,  44,  64],
                   [ 49,  45,  62],
                   ...,
                   [101,  82,  84],
                   [105,  89,  90],
                   [131, 115, 116]],

                  [[ 56,  51,  71],
                   [ 62,  58,  75],
                   [ 76,  72,  89],
                   ...,
                   [110,  91,  93],
                   [115,  99, 100],
                   [141, 125, 126]],

                  [[ 94,  90, 107],
                   [102,  98, 115],
                   [117, 113, 130],
                   ...,
                   [117,  98, 102],
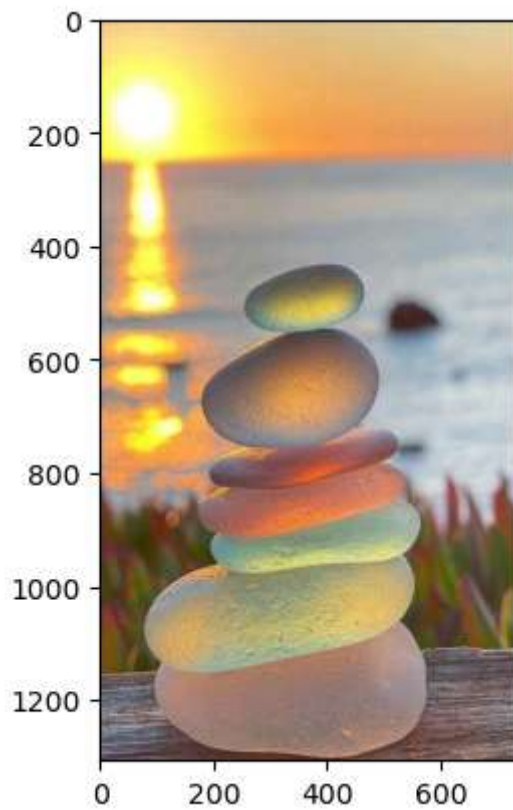                   [125, 109, 112],
                   [151, 135, 138]]], dtype=uint8)
```

```
In [166…   type(arr1)
```

```
Out[166…   numpy.ndarray
```

```
In [167…   arr1.shape
```

Out[167…   (1307, 736, 3)

In [169…
```python
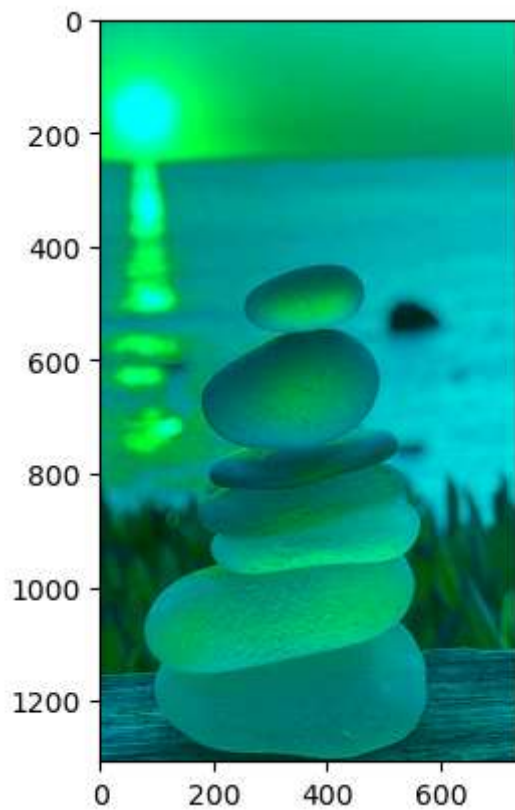plt.imshow(arr1)
plt.show()
```


In [170…
```python
stone_img1 = arr1.copy()
```

In [171…
```python
stone_img1[:,:,0] = 0
```

In [172…
```python
plt.imshow(stone_img1)
plt.show()
```

In [173...   `stone_img1[:,:,1]`

Out[173...
```
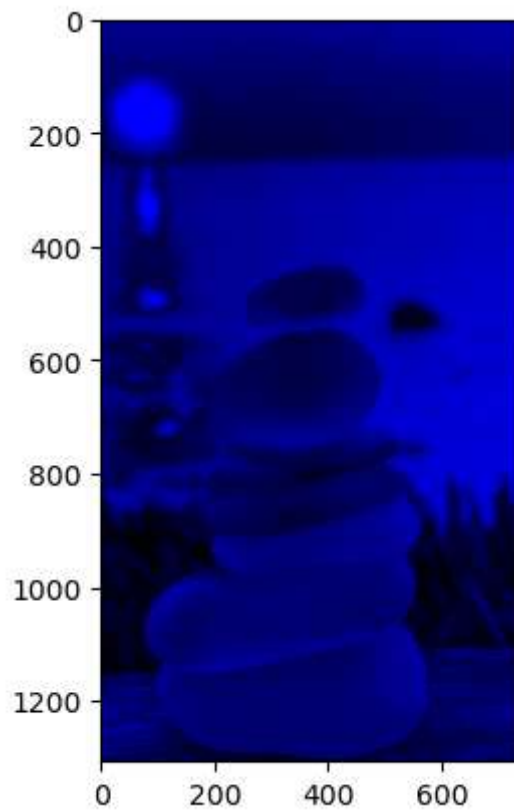array([[200, 200, 200, ..., 208, 211, 190],
       [200, 200, 200, ..., 208, 211, 190],
       [200, 200, 200, ..., 208, 210, 189],
       ...,
       [ 48,  44,  45, ...,  82,  89, 115],
       [ 51,  58,  72, ...,  91,  99, 125],
       [ 90,  98, 113, ...,  98, 109, 135]], dtype=uint8)
```

In [174...   `stone_img1[:,:,1] = 0`

In [176...
```python
plt.imshow(stone_img1)
plt.show()
```

In [ ]: