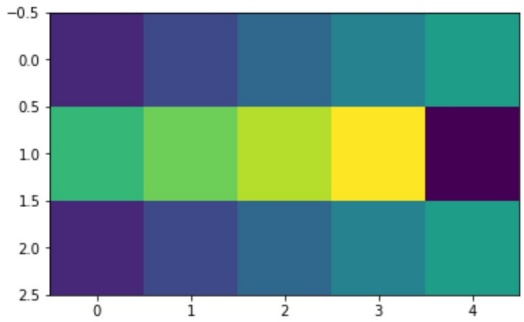
In [8]:
```
import numpy as np
import matplotlib.pyplot as plt
```

In [9]:
```
img=[1,2,3,4,5,6,7,8,9,0,1,2,3,4,5]
i=np.reshape(img,(3,5))
print(i)
plt.imshow(i)
```

```
[[1 2 3 4 5]
 [6 7 8 9 0]
 [1 2 3 4 5]]
```

Out[9]: <matplotlib.image.AxesImage at 0x2cdc04e0488>

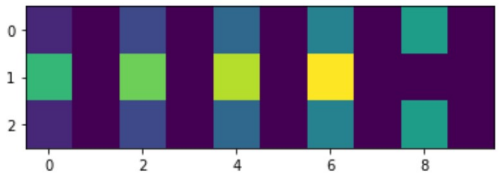


In [10]:
```
newcol=[]
for row in range(0,i.shape[0]):
    for col in range(0,i.shape[1]):
        newcol.append(i[row,col])
        newcol.append(0)

newcol=(np.reshape(newcol,(3,10)))
print(newcol)
plt.imshow(newcol)
```

```
[[1 0 2 0 3 0 4 0 5 0]
 [6 0 7 0 8 0 9 0 0 0]
 [1 0 2 0 3 0 4 0 5 0]]
```

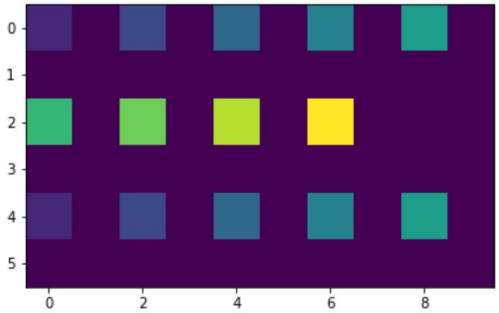
Out[10]: <matplotlib.image.AxesImage at 0x2cdc38b83c8>



In [11]:
```
newrow=[]
for row in range(0,newcol.shape[0]):
    for col in range(0,newcol.shape[1]):
        newrow.append(newcol[row,col])
    for l in range(0,newcol.shape[1]):
        newrow.append(0)
zi=np.reshape(newrow,(6,10))
print(zi)
plt.imshow(zi)
```

```
[[1 0 2 0 3 0 4 0 5 0]
 [0 0 0 0 0 0 0 0 0 0]
 [6 0 7 0 8 0 9 0 0 0]
 [0 0 0 0 0 0 0 0 0 0]
 [1 0 2 0 3 0 4 0 5 0]
 [0 0 0 0 0 0 0 0 0 0]]
```

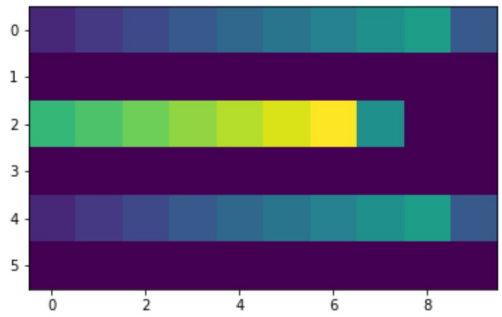
Out[11]: <matplotlib.image.AxesImage at 0x2cdc3918508>



In [12]:
```
ni_col=[]
for row in range(0,zi.shape[0]):
    for col in range(0,zi.shape[1]):
        if(col%2==1 and col<zi.shape[1]-2):
            ni_col.append((zi[row,col-1]+zi[row,col+1])/2)
        elif(col%2==1 and col==zi.shape[1]-1):
            ni_col.append(zi[row,col-1]/2)
        else:
            ni_col.append(zi[row,col])
ni_col=(np.reshape(ni_col,(6,10)))
print(ni_col)
plt.imshow(ni_col)
```

```
[[1.  1.5 2.  2.5 3.  3.5 4.  4.5 5.  2.5]
 [0.  0.  0.  0.  0.  0.  0.  0.  0.  0. ]
 [6.  6.5 7.  7.5 8.  8.5 9.  4.5 0.  0. ]
 [0.  0.  0.  0.  0.  0.  0.  0.  0.  0. ]
 [1.  1.5 2.  2.5 3.  3.5 4.  4.5 5.  2.5]
 [0.  0.  0.  0.  0.  0.  0.  0.  0.  0. ]]
```

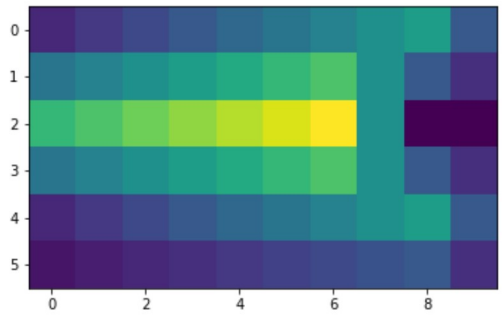
Out[12]: <matplotlib.image.AxesImage at 0x2cdc3979208>



In [13]:
```
ni_row=[]
for row in range(0,ni_col.shape[0]):
    for col in range(0,ni_col.shape[1]):
        if(row%2==1 and row<ni_col.shape[0]-2):
            ni_row.append((ni_col[row-1,col]+ni_col[row+1,col])/2)
        elif(row%2==1 and row==ni_col.shape[0]-1):
            ni_row.append(ni_col[row-1,col]/2)
        else:
            ni_row.append(ni_col[row,col])
ni_row=(np.reshape(ni_row,(6,10)))
print(ni_row)
plt.imshow(ni_row)
```

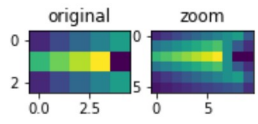
```
[[1.   1.5  2.   2.5  3.   3.5  4.   4.5  5.   2.5 ]
 [3.5  4.   4.5  5.   5.5  6.   6.5  4.5  2.5  1.25]
 [6.   6.5  7.   7.5  8.   8.5  9.   4.5  0.   0.  ]
 [3.5  4.   4.5  5.   5.5  6.   6.5  4.5  2.5  1.25]
 [1.   1.5  2.   2.5  3.   3.5  4.   4.5  5.   2.5 ]
 [0.5  0.75 1.   1.25 1.5  1.75 2.   2.25 2.5  1.25]]
```

Out[13]: <matplotlib.image.AxesImage at 0x2cdc39dfbc8>



In [14]:
```
plt.subplot(241),plt.imshow(i),plt.title("original")
plt.subplot(242),plt.imshow(ni_row),plt.title("zoom")
```

Out[14]:
```
(<matplotlib.axes._subplots.AxesSubplot at 0x2cdc2fbb2c8>,
 <matplotlib.image.AxesImage at 0x2cdc3a70c08>,
 Text(0.5, 1.0, 'zoom'))
```



In [ ]: