Problem 4 (b)

First, define the probabilities of X, Y, and Z using the arrays

```
In [1]: pX = []
        pX.append(1/2)
        pX.append(1/2)

        print(pX)

        [0.5, 0.5]
```

```
In [2]: pY = []
        pY.append(1/2)
        pY.append(1/2)

        print(pY)

        [0.5, 0.5]
```

```
In [3]: pZ = []
        pZ.append(1/2)
        pZ.append(1/2)

        print(pZ)

        [0.5, 0.5]
```

Then the joint entropy, $H(X, Y, Z)$ is, at a minium, given by

```
In [4]: import math

        Hxyz = 0
        for i in range(2):
            for j in range(2):
                for k in range(2):
                    Hxyz += - (pX[i]*pY[j]*pZ[k]) * math.log2(pX[i]*pY[j]*
        pZ[k])

        print(Hxyz)

        3.0
```