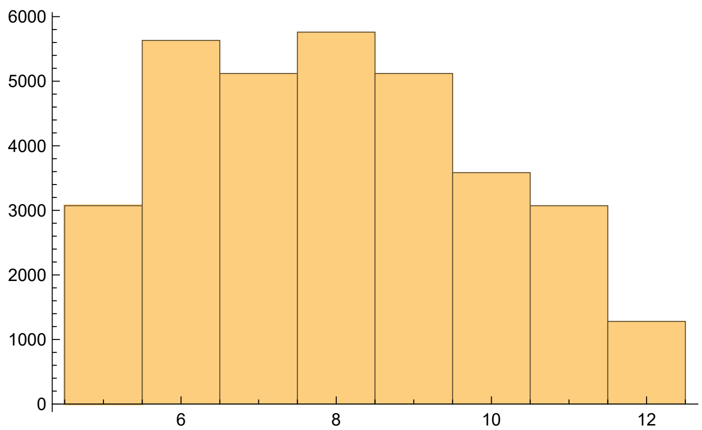
Generating the (16, 256, 5) sequential code.

In[1]:=
```
n = 16;
d = 5;
code = {ConstantArray[0, n]};
For[i = 0, i ≤ 2^n - 1, i++,
 v = IntegerDigits[i, 2, n];
 If[Apply[And, Table[HammingDistance[code[[k]], v] ≥ d, {k, Length[code]}]],
  code = Append[code, v]]
]
Length[code]
```

Out[5]= 256

Calculating all pairwise Hamming distances between codewords for the code above.

In[6]:=
```
d1 = {};
For[i = 2, i ≤ Length[code], i++,
 For[j = 1, j < i, j++,
  d1 = Append[d1, HammingDistance[code[[i]], code[[j]]]]]
]
Histogram[d1]
```

Out[8]=


Generating the Nordstrom Robinson code (15, 256, 5).

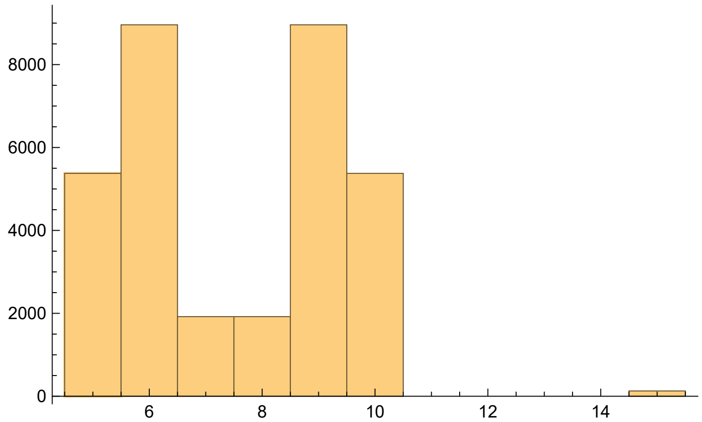
In[9]:=
```
x = Tuples[{0, 1}, 8];
code = Table[Join[x[[n]],
    Table[Mod[x[[n, 8]] + x[[n, Mod[i + 6, 7] + 1]] + x[[n, Mod[i, 7] + 1]] + x[[n, Mod[i + 1, 7] + 1]] +
       x[[n, Mod[i + 3, 7] + 1]] + (x[[n, Mod[i, 7] + 1]] + x[[n, Mod[i + 4, 7] + 1]])
         (x[[n, Mod[i + 1, 7] + 1]] + x[[n, Mod[i + 2, 7] + 1]] + x[[n, Mod[i + 3, 7] + 1]] +
           x[[n, Mod[i + 5, 7] + 1]]) + (x[[n, Mod[i + 1, 7] + 1]] + x[[n, Mod[i + 2, 7] + 1]])
         (x[[n, Mod[i + 3, 7] + 1]] + x[[n, Mod[i + 5, 7] + 1]]), 2], {i, 0, 6}]], {n, 256}];
Length[code]
```

Out[11]= 256

Calculating all pairwise Hamming distances between codewords for the Nordstrom Robinson code.

In[12]:=
```
d2 = {};
For[i = 2, i ≤ Length[code], i++,
 For[j = 1, j < i, j++,
  d2 = Append[d2, HammingDistance[code⟦i⟧, code⟦j⟧]]]
]
Histogram[d2]
```

Out[14]=



It is clear that the two codes above are not equivalent since in the Nordstrom Robinson code there are no codewords with Hamming distance of 11, but in the sequential code there are 3,072 pairs of codewords with Hamming distance of 11.

In[15]:=
```
Count[d1, 11]
```

Out[15]= 3072

Generating the (17, 512, 5) sequential code.

In[16]:=
```
n = 17;
d = 5;
code = {ConstantArray[0, n]};
For[i = 0, i ≤ 2^n - 1, i++,
 v = IntegerDigits[i, 2, n];
 If[Apply[And, Table[HammingDistance[code⟦k⟧, v] ≥ d, {k, Length[code]}]],
  code = Append[code, v]]
]
Length[code]
```

Out[20]= 512

Calculating all pairwise Hamming distances between codewords for the sequential (17, 512, 5) code.

In[21]:=
```
d3 = {};
For[i = 2, i ≤ Length[code], i++,
 For[j = 1, j < i, j++,
  d3 = Append[d3, HammingDistance[code[[i]], code[[j]]]]]
]
Histogram[d3]
```

Out[23]=