





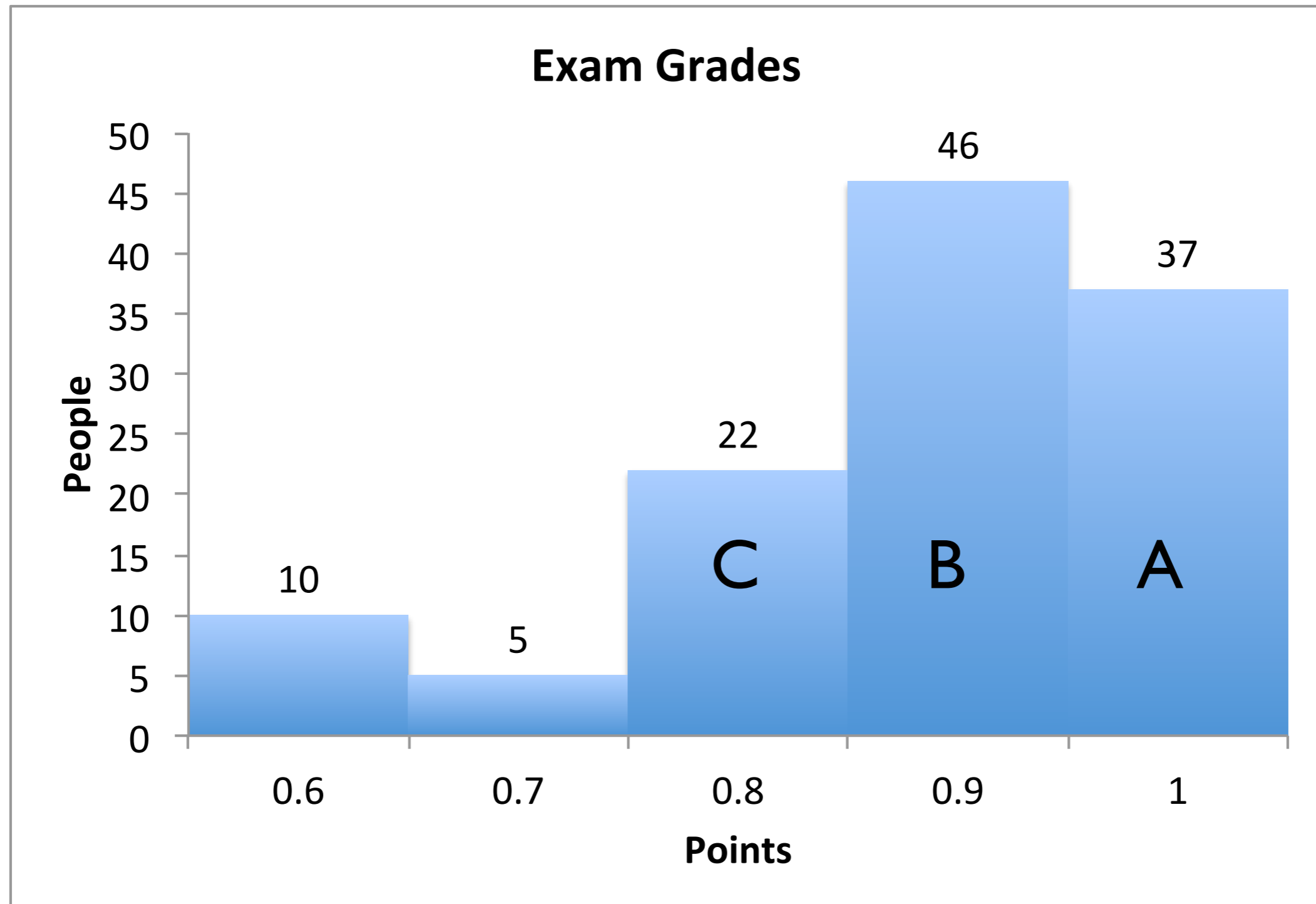
- Pick up your exam
  - if there is a “total” do NOT assume that it is correct
- Check that you have all of your points
- Check your grade on Sakai
- If any of these are wrong, please let us know ASAP so that we can fix it

# Today

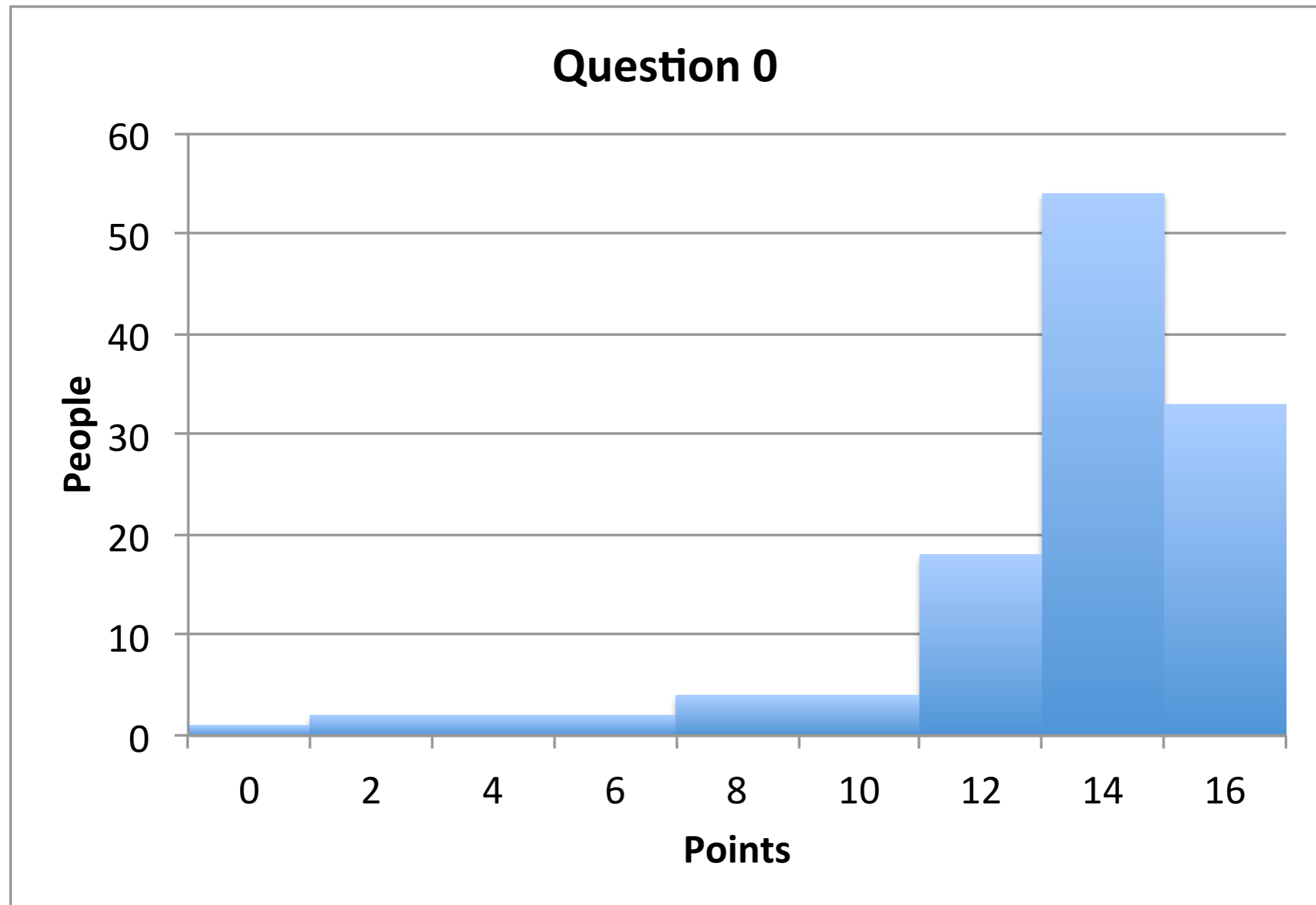


- The exam
- Intro to DNA assignment
- Back to linked lists

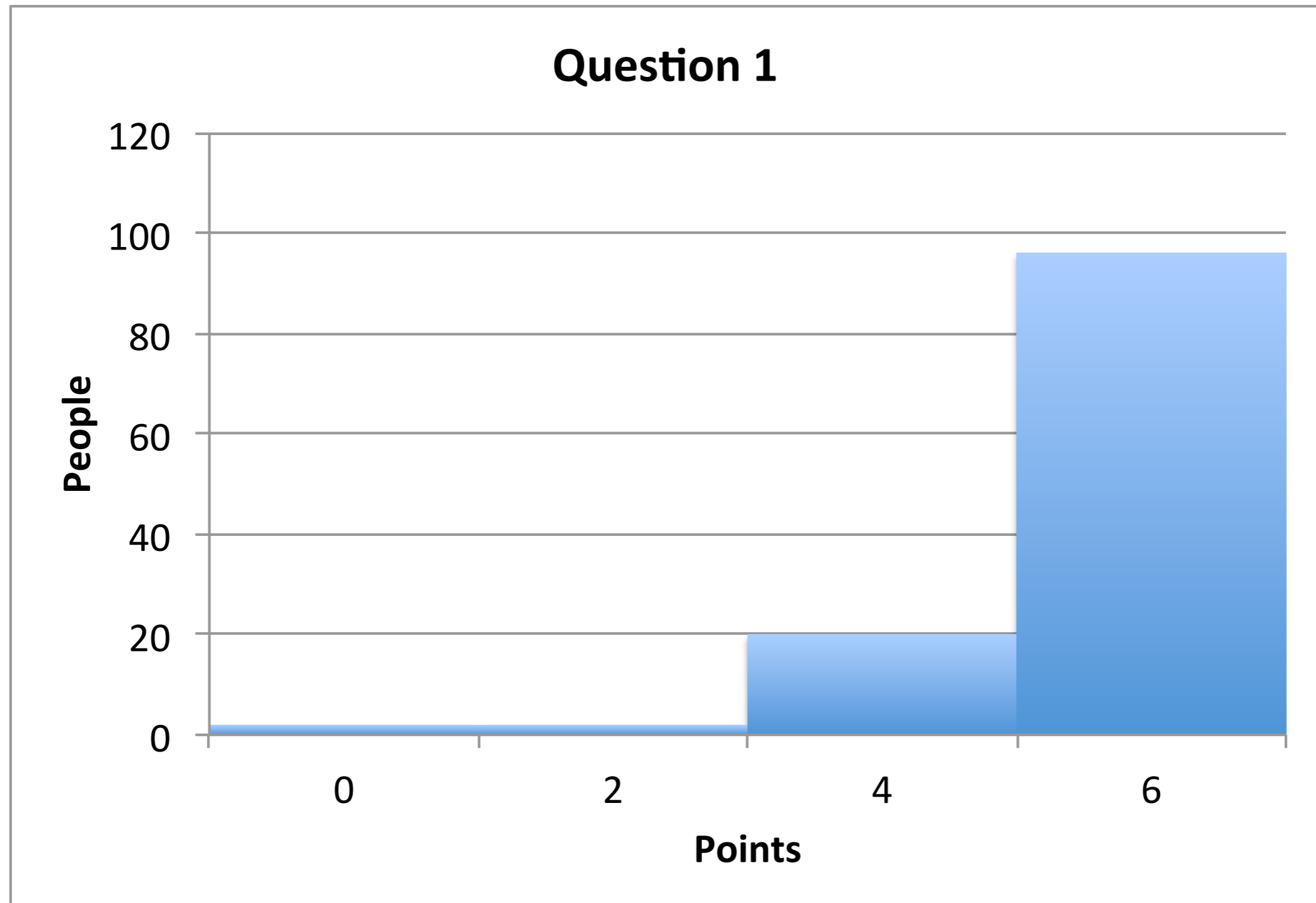
# The Exam



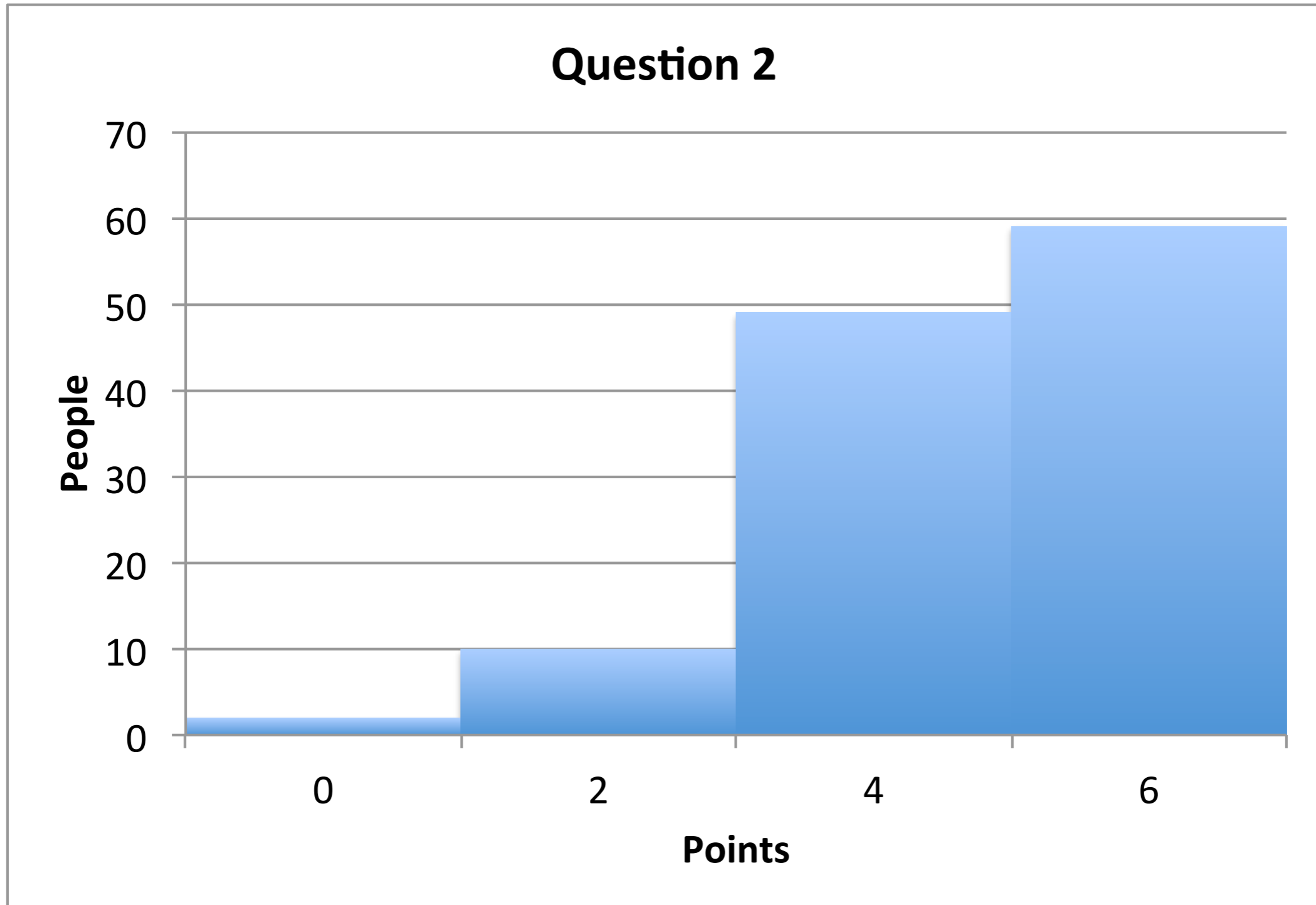
# Question 0



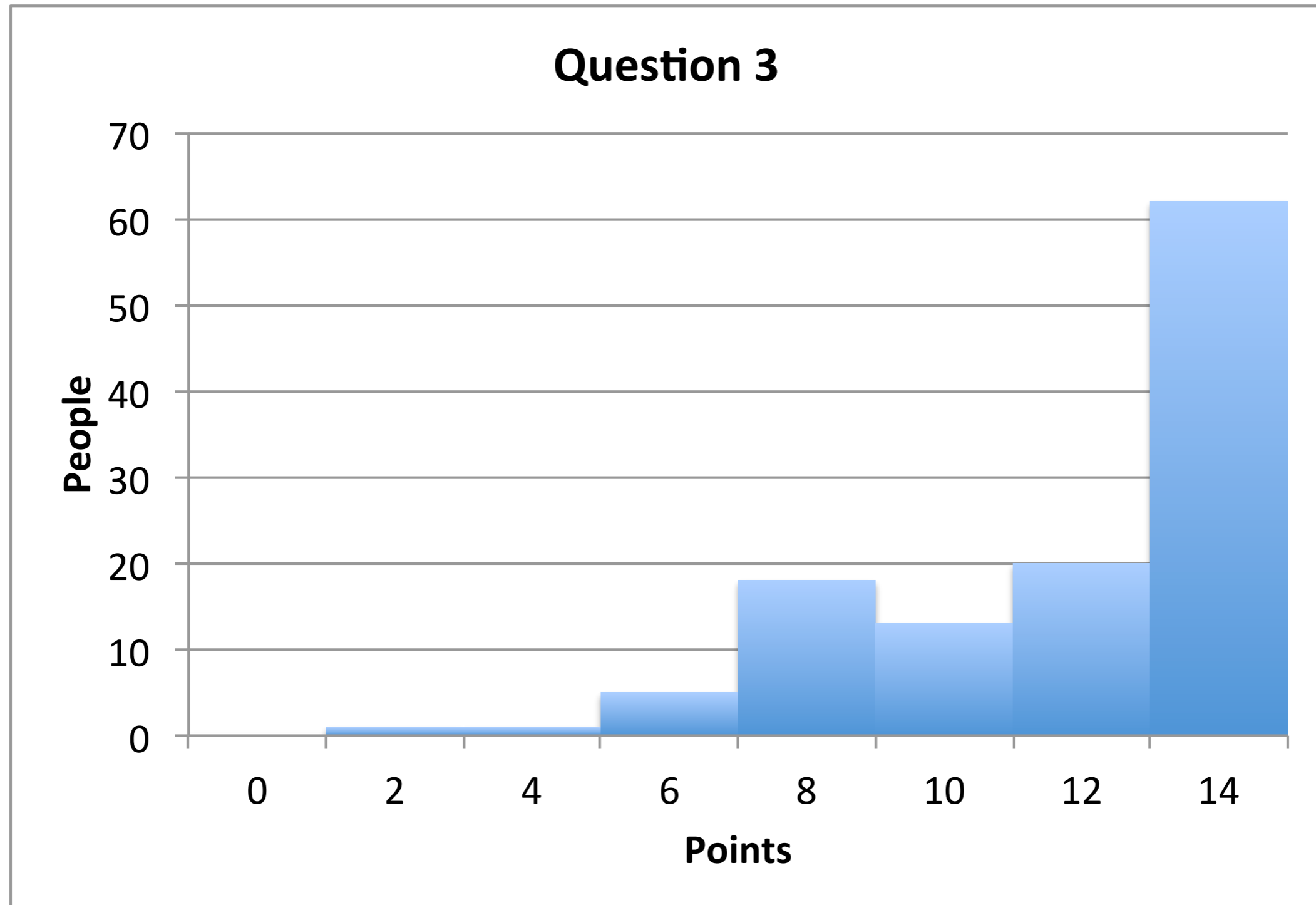
# Question 1



# Question 2

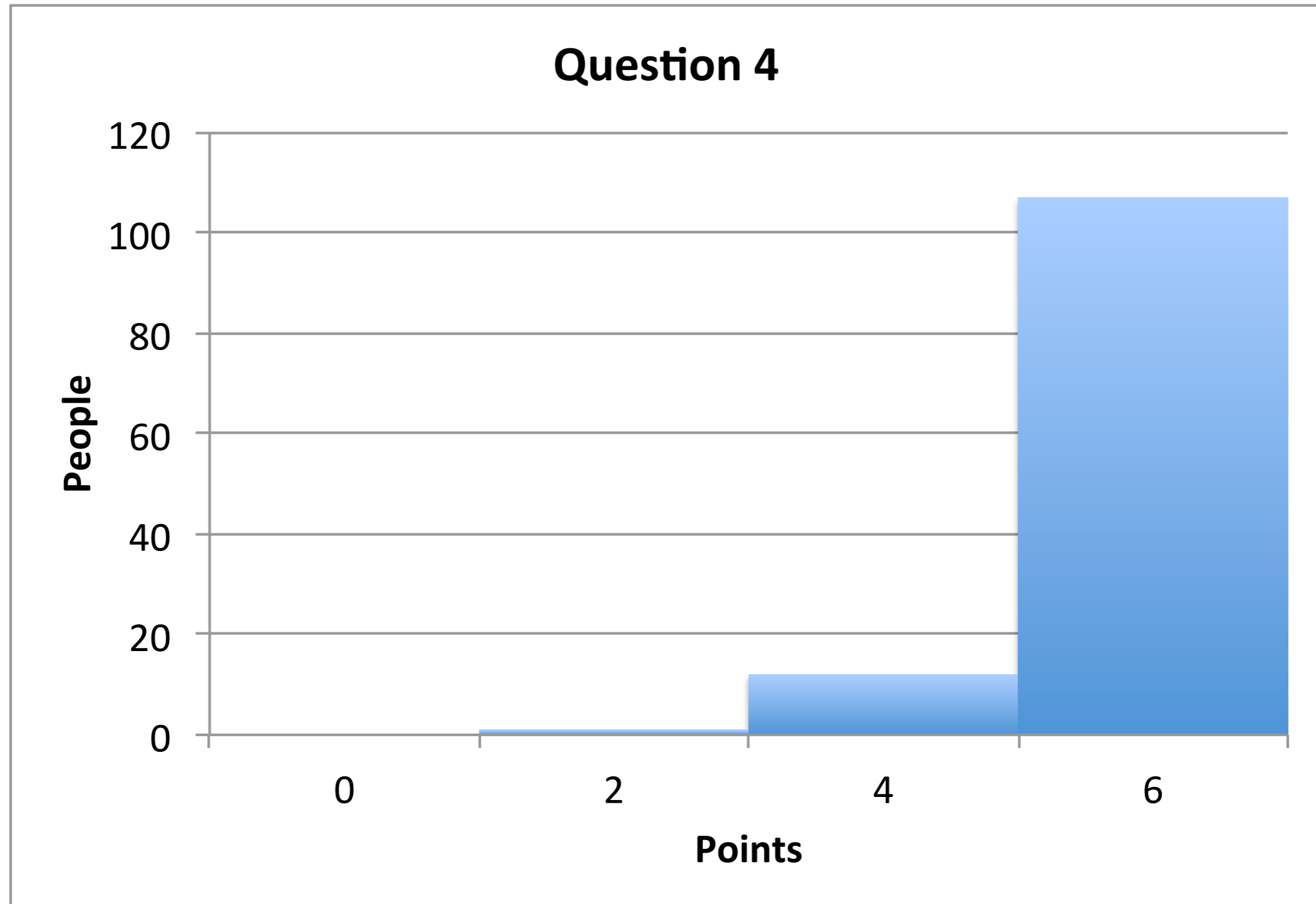


# Question 3

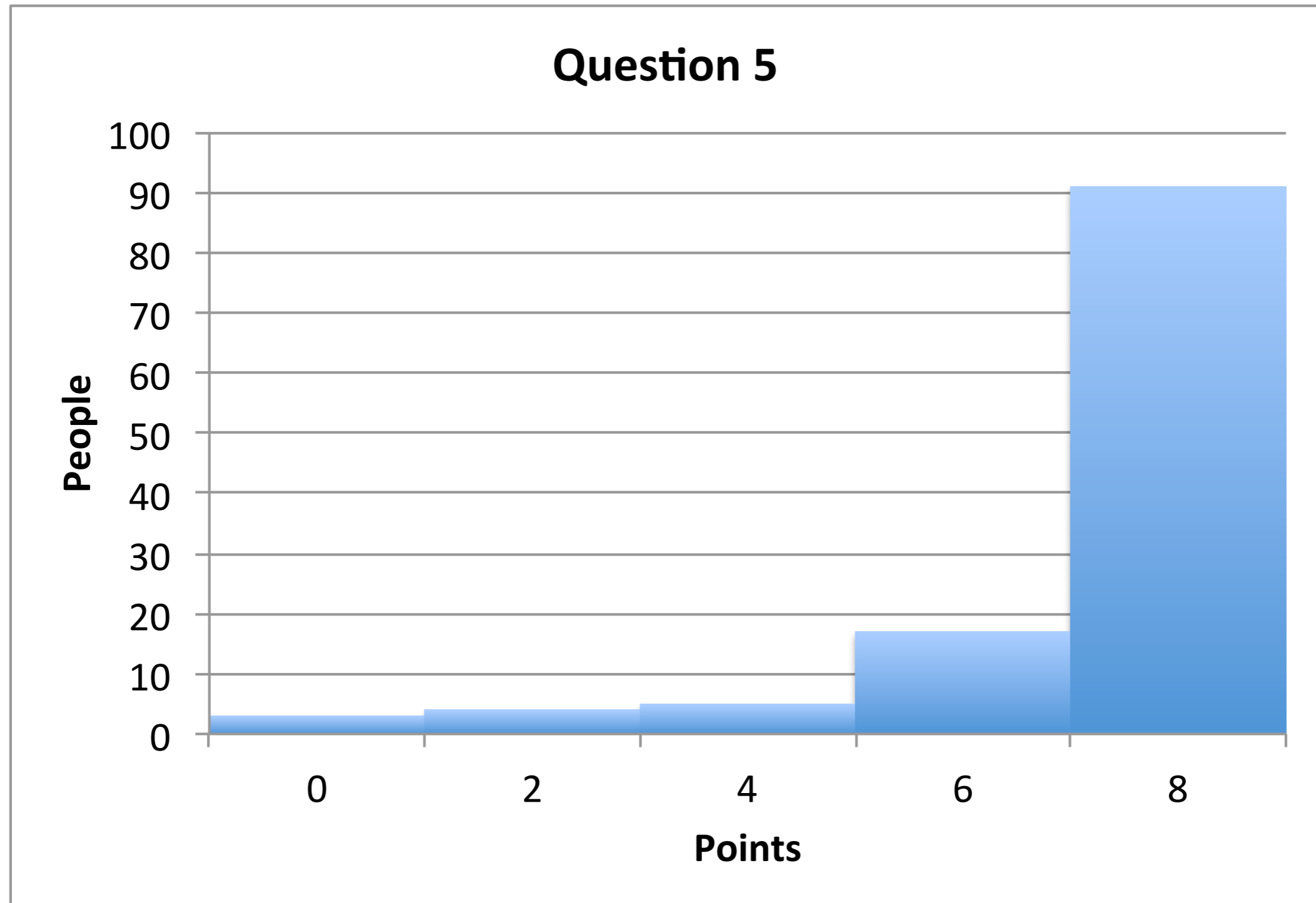




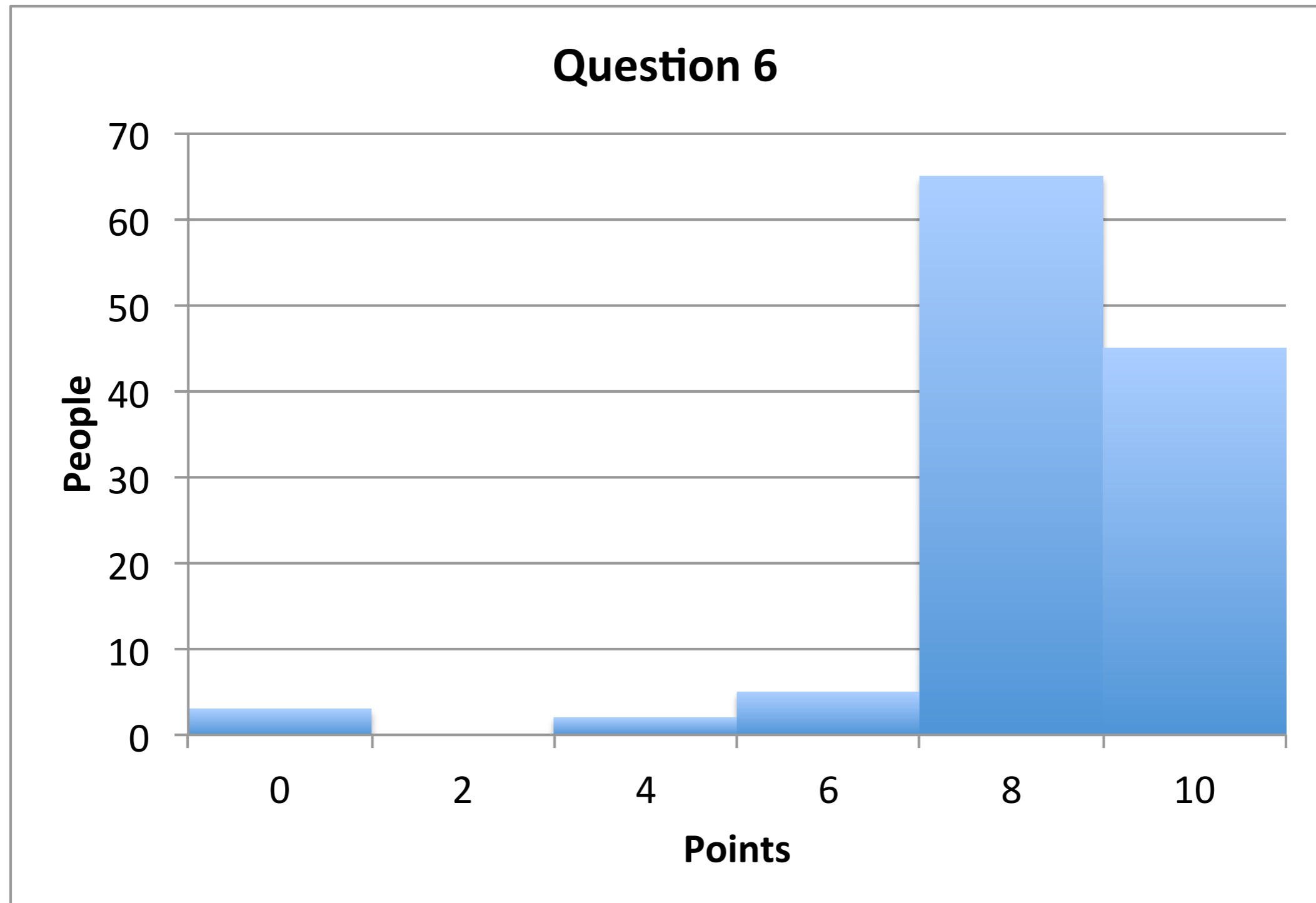
# Question 4



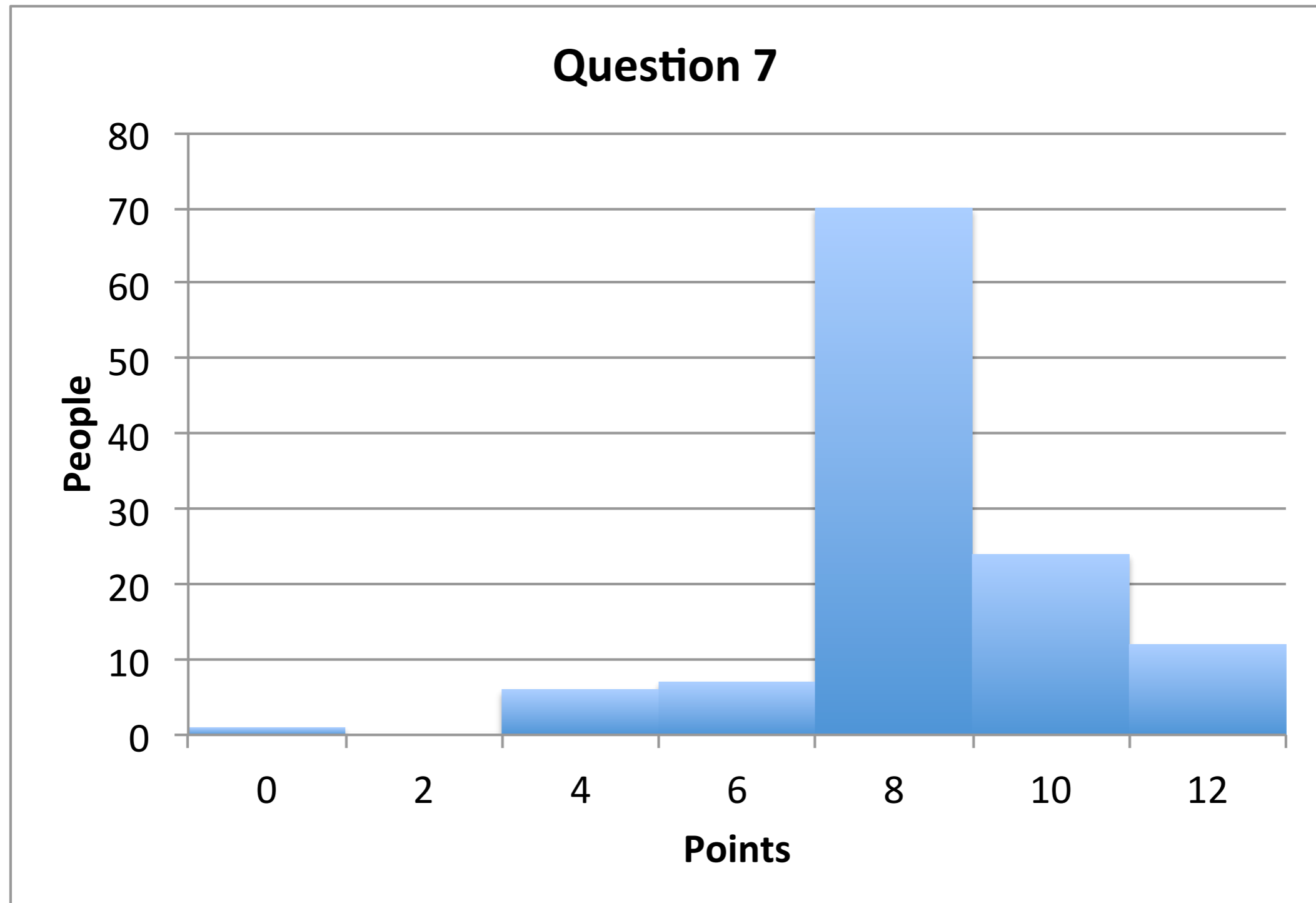
# Question 5



# Question 6



# Question 7



# DNA



```
61  tgatagcagc  ttctgaactg  gttacctgcc  gtgagtaa  taaaatttta  ttgacttagg
121 tcactaaata  ctttaaccaa  tataggcata  gcgcacag  agataaaaat  tacagagtac
181 acaacatcca  tgaaacgcat  tagcaccacc  attaccacca  ccatcaccat  taccacaggt
241 aacggtgceg  gctgacgcgt  acaggaaaca  cagaaaaaag  cccgcacctg  acagtgcggg
301 cttttttttt  cgaccaaagg  taacgaggta  acaaccatgc  gagtgttgaa  gttcggcggt
361 acatcagtg  caaatgcaga  acgttttctg  cgtggtgccg  atattctgga  aagcaatgcc
421 aggcaggggg  aggtggccac  cgtcctctct  gcccccgcca  aatcaccaa  ccacctggtg
481 gcgatgattg  aaaaaacat  tagcggccag  gatgctttac  ccaatatcag  cgatgccgaa
541 cgtatttttg  ccgaactttt  gacgggactc  gccgccgcc  agccgggggt  cccgctggcg
601 caattgaaaa  ctttcgtcga  tcaggaattt  gcccaaataa  aacatgtcct  gcatggcatt
661 agtttgttgg  ggcagtgccc  ggatagcatc  aacgctgcgc  tgatttgccg  tggcgagaaa
721 atgtcgatcg  ccattatggc  cggcgtatta  gaagcgcgcg  gtcacaacgt  tactgttatc
781 gatccggtcg  aaaaactgct  ggcagtgggg  cattacctcg  aatctaccgt  cgatattgct
841 gagtccacc  gccgtattgc  ggcaagccgc  attccggctg  atcacatggt  gctgatggca
901 ggtttcaccg  ccggtaatga  aaaaggcgaa  ctggtggtgc  ttggacgcaa  cggttccgac
961 tactctgctg  cggtgctggc  tgctgttta  cgcgccgatt  gttgagagat  ttggacggac
1021 gttgacgggg  tctataacctg  cgacccgcgt  caggtgcccc  atgagaggtt  gttgaagtcg
```

# Restriction Enzymes



... C T G A A T T C G ...

... C T G A A T T C G ...

# Restriction Enzymes



... C T G A A T T C G ...

... C T G A A T T C G ...

... C T G A A T T C G ...

G T G A T A A A T T C

# Restriction Enzymes



... C T G A A T T C G ...

... C T G A A T T C G ...

... C T G A A T T C G ...

G T G A T A A A T T C

... C T G T G A T A A A T T C G ...



# Two kinds of lists



Just make a copy!

SimpleStrand  
*(Provided!)*

$O(n)$  in time and space

# Two kinds of lists



Just make a copy!

SimpleStrand  
(Provided!)

Runs in  $O(n)$

Do *splicing*

LinkStrand  
(Your responsibility!)

Runs in  $O(b)$

# “Code that already works”



# Interface



```
public interface IMapper {  
    public abstract boolean containsKey(String key);  
    public abstract int get(String key);  
    public abstract void put(String key, int value);  
    public abstract void printAll();  
    public abstract int size();  
}
```

# Interface



```
public interface IMapper {  
    public abstract boolean containsKey(String key);  
    public abstract int get(String key);  
    public abstract void put(String key, int value);  
    public abstract void printAll();  
    public abstract int size();  
}
```

# A Map



- Can be implemented with:
  - array list
  - hash map
  - linked list
  
- But it still works like a map!

# Code



- Snarf the code for today's recitation
- Complete the recitation's assignment from the webpage