```
138  from collections import Counter
     import matplotlib.pyplot as plt
     import csv

     def count_aas(data):
         with open(data, 'r') as file:
             read_data = file.read()
             read_data_split = read_data.split('\n')
             sequences = ""
             for line in read_data_split:
                 if not line.startswith('>'):
                     sequences += line
             counts = dict(Counter(sequences))
         return counts

     def plot_aa_histogram(counts):
         aminoacids = list(counts.keys())
         counted_aa = []
         for aminoacid in aminoacids:
             counted_aa.append(counts[aminoacid])

         plt.figure(figsize=(10, 8))
         plt.bar(aminoacids,counted_aa)
         plt.title('counts')
         plt.xlabel('aminoacids')
         plt.ylabel('aminoacid count')
         plt.show()

     counts_human = count_aas('Fasta_komplett.fasta')
     print(counts_human)
     plot_aa_histogram(counts_human)

     counts_thaliana = count_aas('A_thaliana.fasta')
     print(counts_thaliana)
     plot_aa_histogram(counts_thaliana)

     counts_maus = count_aas('Maus.fasta')
     print(counts_maus)
     plot_aa_histogram(counts_maus)

     counts_bacillus = count_aas('bacillus.fasta')
     print(counts_bacillus)
     plot_aa_histogram(counts_bacillus)

     counts_archae = count_aas('archae.fasta')
     print(counts_archae)
     plot_aa_histogram(counts_archae)

     a_file = open("human_aa_distrib.csv", "w")
     writer = csv.writer(a_file)
     writer.writerow(['aa', 'count'])
     for key, value in counts_human.items():
         writer.writerow([key, value])

     a_file = open("thaliana_aa_distrib.csv", "w")
     writer = csv.writer(a_file)
     writer.writerow(['aa', 'count'])
     for key, value in counts_thaliana.items():
         writer.writerow([key, value])

     a_file = open("maus_aa_distrib.csv", "w")
     writer = csv.writer(a_file)
     writer.writerow(['aa', 'count'])
     for key, value in counts_maus.items():
         writer.writerow([key, value])

     a_file = open("bacillus_distrib.csv", "w")
     writer = csv.writer(a_file)
```

```
writer.writerow(['aa', 'count'])
for key, value in counts_human.items():
    writer.writerow([key, value])

a_file = open("archae_distrib.csv", "w")
writer = csv.writer(a_file)
writer.writerow(['aa', 'count'])
for key, value in counts_human.items():
    writer.writerow([key, value])
```

{'M': 315, 'K': 781, 'G': 910, 'L': 1507, 'Y': 375, 'F': 559, 'Q': 674, 'S': 1046, 'T': 685, 'D': 670,
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{'M': 208895, 'A': 675072, 'L': 969810, 'V': 590933, 'E': 680122, 'D': 471404, 'G': 628525, 'S': 81173
{'M': 34252, 'L': 118896, 'I': 90689, 'G': 85126, 'K': 86939, 'R': 50326, 'S': 77250, 'Y': 42958, 'Q'
{'M': 73, 'V': 217, 'N': 141, 'L': 185, 'I': 220, 'G': 175, 'Y': 86, 'S': 180, 'K': 208, 'R': 78, 'A'

counts

counts

counts

counts

counts