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| **Homework: Discrete Mathematics and its Applications**  **Name: 郑文鑫 No: 517030910430 ACM Class Date: October.27, 2017**  **Exercise List: Chapter 4.2(11,13,27,31,50,58); Chapter 4.3(6,13,19,23)** |

Chapter 4.2

**11.** Because it is the conversion between binary expansion and hexadecimal expansion of a certain number, we can convert it by dividing the binary expansion into several groups with four numbers like the following statement.



Then, with the rapid conversion, we can get the answer.



**13.** Suppose there is a binary expansion of a positive number , then convert it into decimal expansion, that is like the following statement.



Then we divide the number for every four  groups, take the common multiple for each four-numbered group as



We take the common part out and we get the following.



Noticing that ，so  can be written in a 16-based number.

Therefore, .

**27.** 

**31.** Suppose there is a positive number , we can write it in the following way.



Then , and there is (n-2) times of digit 9 in the first number.

Next, we can found that . Therefore, if  is true , we can conclude that .

For its opposite side, we use contradiction to show this, suppose there is a positive number  that follows  and .

From Theorem 1 in Chapter 4.2, we can find that .

While , , , we can conclude that there isn’t any  following the condition. Therefore, we get the conclusion.

**50.** First, we get number i,j

int p = 2;

while(i>0,j>0){

a[p-1] = i % (p-1);b[p-1]=j %(p-1);

i=i/(p-1);j=j/(p-1)

p++;

}

for(int i = 1;i < p; i++) ans=(a[i]+b[i])\*i!+ans

while(i>0,j>0){

key[p-1] = ans % (p-1);

ans=ans/(p-1);

p++;

}

**58.**