# 【华工包打听说明】

校园资讯，问题答疑，感情树洞
万事皆可找包包

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我们是华工包打听，由校内学生组建而成的校园自媒体
立志成为陪伴华园学子度过漫长岁月的一盏灯

| SCUT包打听（新） | 华工包打听 | 华工卫星站 | 包打听公众号 | 包打听QQ |

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1. AAACC     CBACB

2. Fill the blank with correct C++ codes:     (16 scores)
(1)
```
int r = n;          // l and r beyond array bounds
 while (l+1 != r) {    // Stop when l and r meet
    ___ int i= （l+r）/2_____;     // Look at middle of subarray
   if (K < array[i])    __ r=i ___;      // In left half
   if (K == array[i])   return i ;    // Found it
   if (K > array[i])    ___ l=i ___      // In right half
 }
 // K is not in array or the greatest value is less than K
 if K> array[0]   （or l!= -1） // the lest value in the array is greater than K with l updated
      return   l  ;   // when K itself does not appear in the array
    else     return   ERROR;   // the integer with the lest value greater than K
}
```

(2)In order to insert a new node s after the node which pointer q points to in a circular doubly linked list, we need to execute the following statements:

s->prior=q;

s->next=q->next;

q->next->prior=s ;

(3)  The height of a complete binary tree with k nodes is ___$\lceil \log_2(k+1) \rceil$___(1 node tree has hight 1) (2 scores)

3.

Consider a list L containing n values. L has n(n-1)/2 distinct pairs of values, each of which could potentially be in a right order or bad order. In average, that is n(n-1)
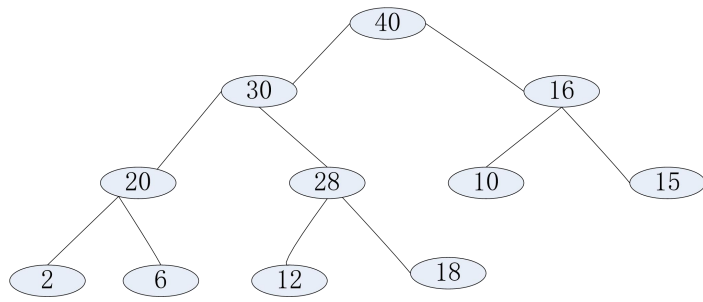
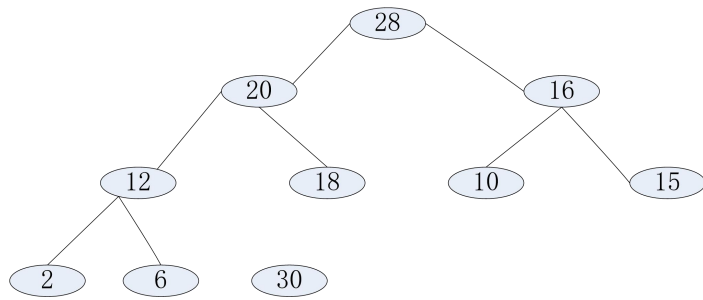/4. We can therefore say that exchange sorts are $\theta(n^2)$ in average amd worst case.
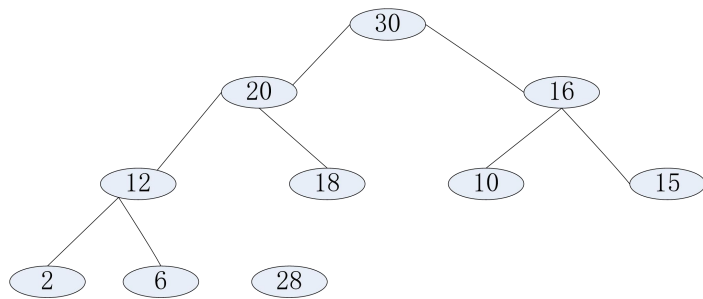
4.

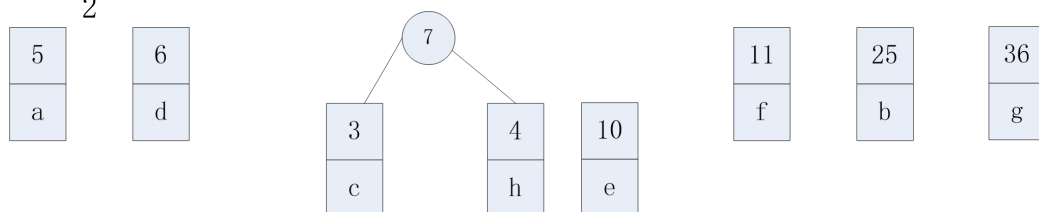1）$\theta(n)$  2）$\theta(n^2)$   3）$\theta(n)$

5.

1）

40
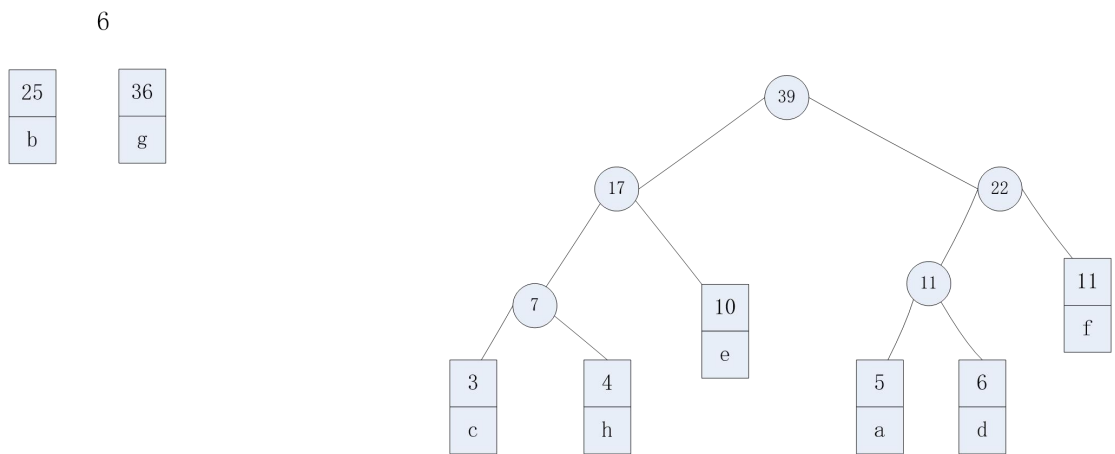30    16
20  28  10  15
2  6  12  18

2）

28
20    16
12  18  10  15
2  6  30

3）

30
20    16
12  18  10  15
2  6  28

6.
1）pictures

1

| 3 | 4 | 5 | 6 | 10 | 11 | 25 | 36 |
| c | h | a | d | e | f | b | g |

2

| 5 | 6 | 7 | | 11 | 25 | 36 |
| a | d | | | f | b | g |

| 3 | 4 | 10 |
| c | h | e |

3

7
3 / c
4 / h

10 / e

11
5 / a
6 / d

11 / f

25 / b

36 / g

4

11
5 / a
6 / d

11 / f

17
7
3 / c
4 / h
10 / e

25 / b

36 / g

5

17
7
3 / c
4 / h
10 / e

22
11
5 / a
6 / d
11 / f

25 / b

36 / g

6

25 / b

36 / g

39
17
7
3 / c
4 / h
10 / e
22
11
5 / a
6 / d
11 / f

7

39
17
22
7
10
e
11
11
f
3
c
4
h
5
a
6
d
61
25
b
36
g

8
100
0
1
39
61
0
1
0
1
17
22
25
b
36
g
0
1
0
1
7
10
e
11
11
f
0
1
0
1
3
c
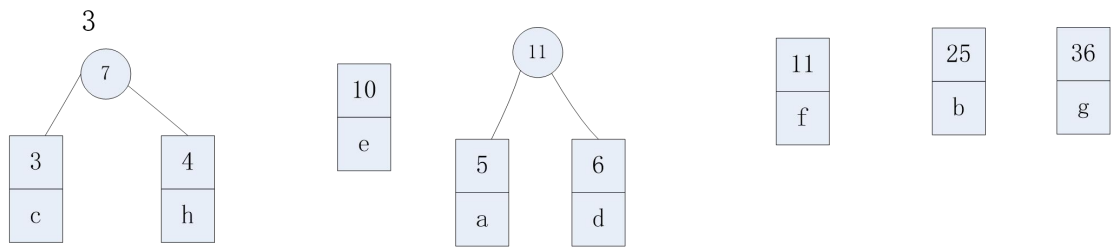4
h
5
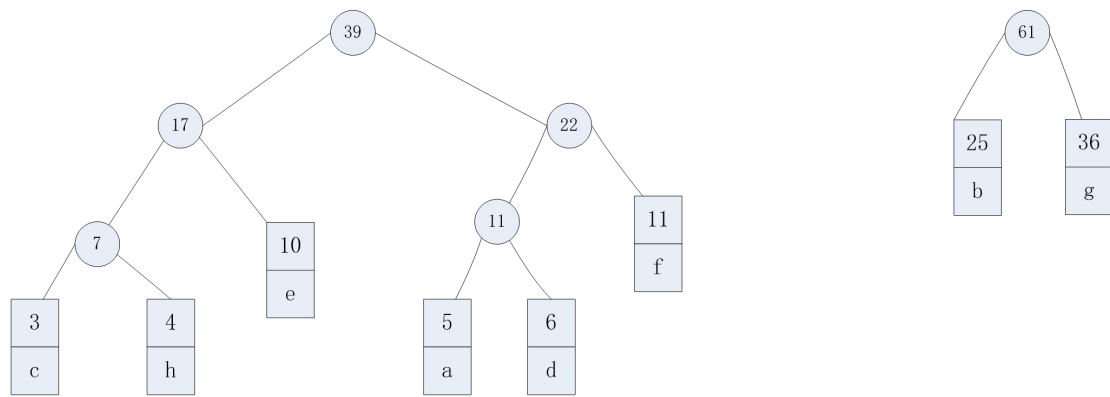a
6
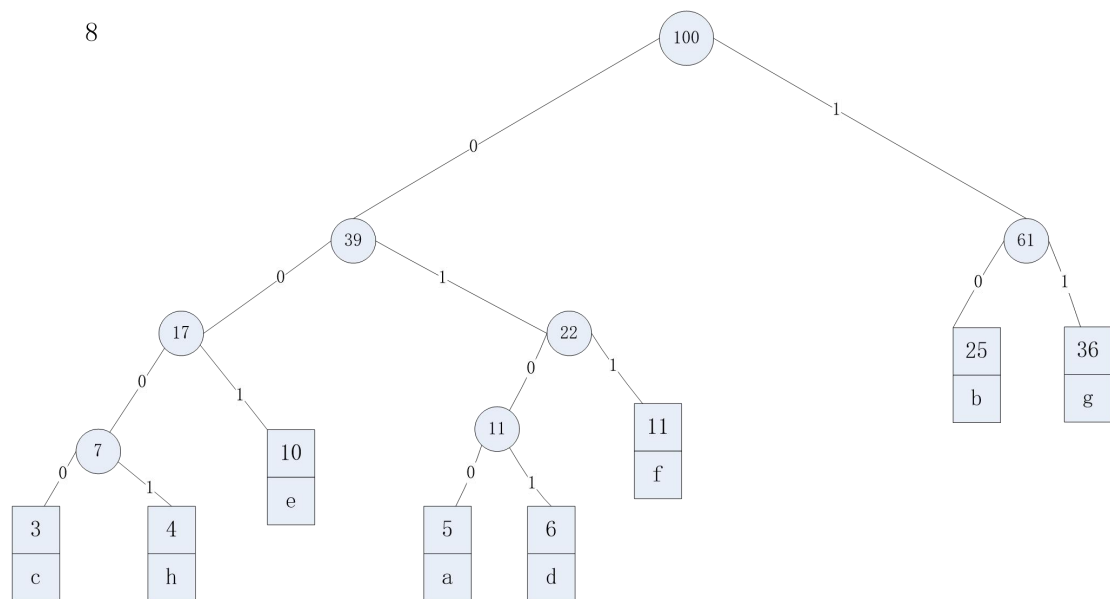d
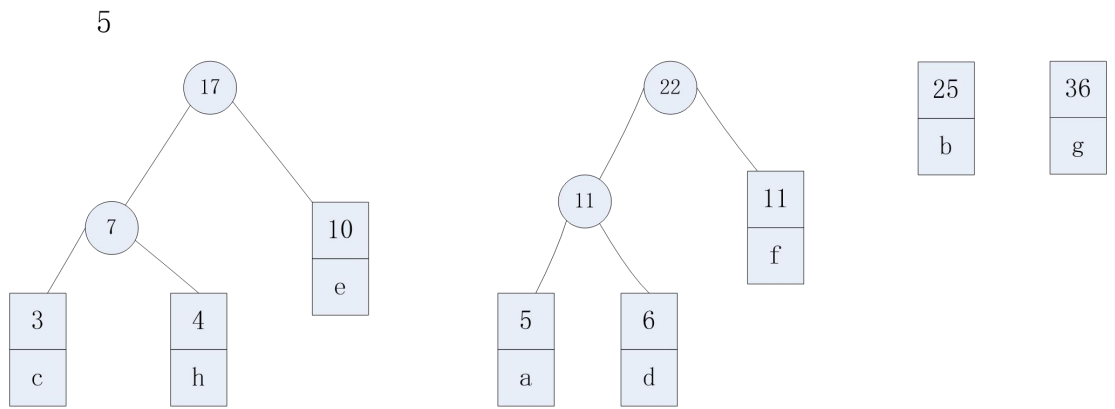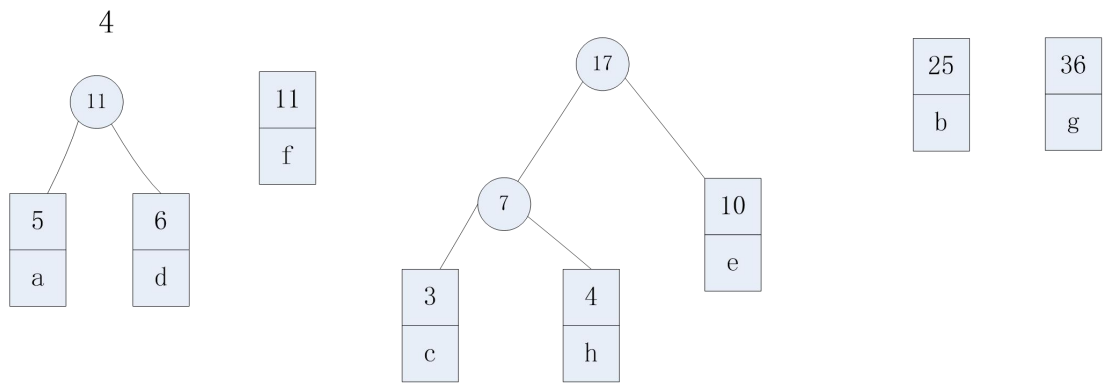
2）expected bit-length

$[(3+4+5+6)\times 4+(10+11)\times 3+(25+36)\times 2]\div 100=2.57$

3）advantage
Huffman code scheme saves text length in most cases.

7.
1） $x = M / s$
2）

$\because 2M \bullet x^{k} = f$

$\therefore k = \log_{x} \dfrac{f}{2M} = \log_{\frac{M}{s}} \dfrac{f}{2M}$

3）

Here $k = \log_{\frac{100}{10}} \dfrac{200000}{200} = \log_{10} \dfrac{2000}{2} = \log_{10} 1000 = 3$ , which implies we need 3

passes.

In each pass， we need read $\dfrac{f}{s} = \dfrac{200000}{10} = 20000$ blocks。

To read a block， we have to access disk $\dfrac{s}{2} = \dfrac{10}{2} = 5$ times.

thus， the times of reading disk is

$3 \times 20000 \times 5 = 3 \times 10^5$

8.
H1(22)=0, H1(41)=2, H1(53)=5, H1(46)=6, no conflict
When H1(30)=2, H2(30)=1 （2+1*1）%11=3，so 30 enters the 3rd slot;
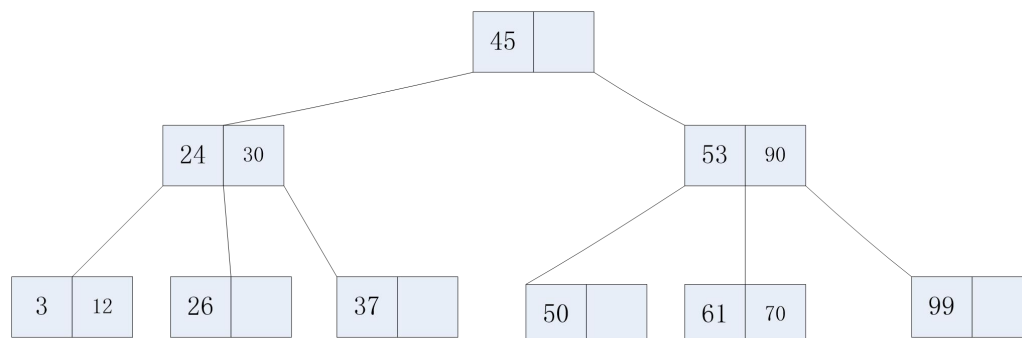H1(13)=6, H2(13)=2 (6+1*2)%11=8, so 13 enters the 8th slot;
H1(1)=3, H2(1)=8 (3+5*8)%11= 10 so 1 enters 10 (pass by 0, 8, 5, 2 );
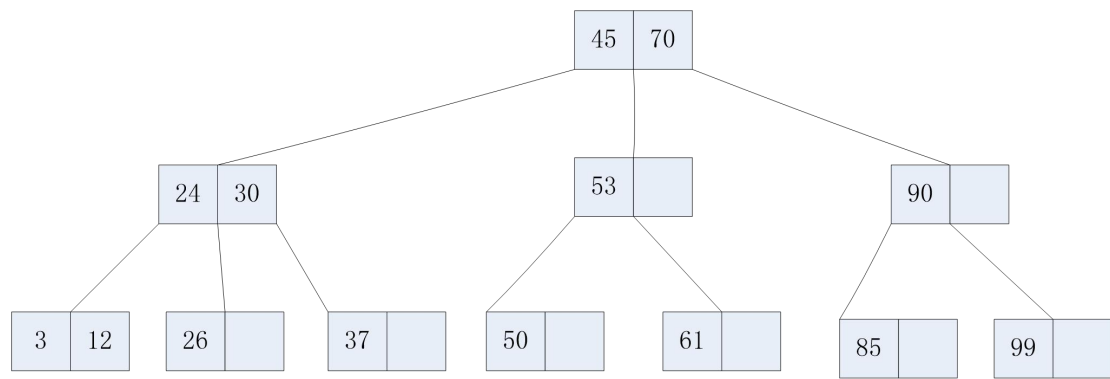　H1(67)=3, H2(67)=10 (3+2*10)%11= 1 so 67 enters 1(pass by 2)

| 22 | 67 | 41 | 30 | | 53 | 46 | | 13 | | 1 |
|----|----|----|----|---|----|----|---|----|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

9.
1）



2）

45 | 70

24 | 30

53

90

3 | 12

26

37

50

61

85

99

3）

45

24

70

7

30

53

90

3

12

26

37

50

61

85

99

10.

1） 1，6，5，2，3，4

2）

2

5

4

10

1

3

3

2

6

3

5