

作业7解答:

1. 以下算法称为 Shell 排序

```
PROCEDURE Shellsort (VAR A: ARRAY[1..n] OF integer);  
VAR  
    i, j, incr: integer;  
BEGIN  
    incr := n DIV 2;  
    WHILE incr > 0 DO  
        BEGIN  
            FOR i := incr + 1 TO n DO  
                BEGIN  
                    j := i - incr;  
                    WHILE j > 0 DO  
                        IF A[j] > A[j + incr] THEN  
                            BEGIN  
                                swap(A[j], A[j + incr]);  
                                j := j - incr;  
                            END  
                        ELSE j := 0 {break}  
                    END;  
                END;  
            incr := incr DIV 2;  
        END  
    END;  
END;
```

(2) 用 Shell 排序算法将下列序列排序: 22, 36, 6, 79, 26, 45, 75, 13, 31, 62, 27, 76, 33, 16, 62, 47。写出排序过程。

(b)\* 试分析 Shell 排序算法的最坏情况下时间复杂度。

(\* 选做。提示: 最坏情况时间复杂度为  $O(n^{1.5})$ )。

解: (a)  $incr = 8$

22, 36, 6, 79, 26, 45, 75, 13, 31, 62, 27, 76, 33, 16, 62, 47

$incr = 4$

22, 36, 6, 76, 26, 16, 62, 13, 31, 62, 27, 79, 33, 45, 75, 47

$incr = 2$

22, 16, 6, 13, 26, 36, 27, 76, 31, 45, 62, 47, 33, 62, 75, 79

$incr = 1$

6, 13, 22, 16, 26, 36, 27, 45, 31, 47, 33, 62, 62, 76, 75, 79

$incr = 0$

6, 13, 16, 22, 26, 27, 31, 33, 36, 45, 47, 62, 62, 75, 76, 79