

算法入门习题2答案

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2.1

1. Data: 6 integers (for 2 dates)
Result: boolean

2.1

- 2. Data: 3 integers (the birth data)
3 integers (today's data)

Result: an integer

2.1

3. Data: 1 integer (value of k)

2 reals (a, b)

$$u_k = a * (k-1) + b$$

Result : 1 real

2.1

4. Data: 1 integer (value of n)

Result : 1 integer

2.1

5. Data: $n+1$ reals: the coef of the polynomial

a real : x

Result : a real

2.2

A)Data : 1000 reals – source is a file

Additional data can be the file name : a list of characters

Result : 1 real value

Other method: 2 reals

2.2

B)

if $M_ (n)$ is the largest value of a list of n ,

$$M_ (n+1) = \max(M_ (n), \text{value } n+1)$$

2.2

C) Analysis result:

1. Read MaxVal,
2. repeat 999 times,
 - a. Read Val
 - b. If $Val > MaxVal$ replace MaxVal by Val
3. display MaxVal

2.3

A) Data : a non negative integer (>0)

Result : an integer

2.3

B) Initialization : $F=0!=1$

Relation: $F(k)=F(k-1)*k$

2.3

C) Analysis result

1. initialize F to 1, k to 0,
2. read N
3. repeat N times
 - a. increase k
 - b. update F using the relation
4. display the result

2.5

Analysis result:

1. Initialization C to 1, p to 0
2. Read N
3. Write C
4. Repeat N times
 - a. Add 1 to p
 - b. Change C according to $(N-p+1)/p * C$
 - c. Display C

2.6

Analysis result:

1. Read h_1, m_1, s_1 (integers)
2. Read h_2, m_2, s_2 (integers)
3. Initialize sign to 1
4. Compute $T_1 = 3600 \cdot h_1 + 60 \cdot m_1 + s_1$ and $T_2 = 3600 \cdot h_2 + 60 \cdot m_2 + s_2$
5. If $T_1 > T_2$,
 - a. Change sign to -1
 - b. Add $24 \cdot 3600$ to T_2
6. Compute diff (integer), $\text{diff} = T_2 - T_1$
7. Convert to $s_diff = \text{diff} \% 60$, $m_diff = ((\text{diff} - s_diff) \% 3600) / 60$, $h_diff = E(\text{diff} / 3600)$
8. Display h_diff, m_diff, s_diff and say that time 2 is in before or after depending on sign value.

2.7

Analysis result↵

1. Read date (D, M, Y integers)↵
2. Set num_day to D (so that 29th of February is taken into account)↵
3. If M=2, add 31 to num_day, if M=3 add 31+28 to num_day ...↵
4. If leap year and (M>2) add 1 to num_day↵
5. Display num_day↵