第 3 讲: 数论算法

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评阅: _____ 评分: _____

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这是适用于问题求解作业的 Typst 模板,
也可用于其他类型的作业与报告等。
该模板仍在进行测试中,
请谨慎使用。

1 作业 (必做部分)

Problem 1 (TC 31.1-12)

Solution:

Problem 2 (TC 31.2-5)

Solution:

Problem 3 (TC 31.3-5)

Solution:

Problem 4 (TC 31.4-2)

Proof:

Problem 5 (TC 31.5-2)

Solution:

Problem 6 (TC 31.6-2)

Solution:

Problem 7 (TC 31.1-13)

Give an efficient algorithm to convert a given β-bit (binary) integer to a decimal representation. Argue that if multiplication or division of integers whose length is at most β takes time $M(\beta) = \Omega(\beta)$, then we can convert binary to decimal in time $O(M(\beta) \lg \beta)$. (Hint: Use a divide-and-conquer approach, obtaining the top and bottom halves of the result with separate recursions.)

勘误详细参见: https://www.cs.dartmouth.edu/ thc/clrs-bugs/bugs-3e.php

Solution:

Problem 8 (TC 31.2-9)

Solution:

Problem 9 (TC 31.5-3)

Solution:

Problem 10 (TC 31.6-3)

Solution:

Problem 11 (TC 31.6-3)

Solution:

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2 作业 (选做部分)

Problem 1 (同余方程组)

解同余方程组:

$$\begin{aligned} x &\equiv 3 \pmod 8 \\ x &\equiv 11 \pmod{20} \\ x &\equiv 1 \pmod{15} \end{aligned}$$

Solution:
