SOFT400111: 面向对象程序设计方法 2022-Fall
Homework-**1** Solutions

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Honor Code: I promise that I finished the homework solutions on my own without copying other people's work.

1. Cast long to int: num = numb ?

```
1  long x = 4850000102L;
2  int num, numb;
3  num = (int) x % 10;
4  numb = (int) (x % 10);
```

Answer: **num ≠ numb**

1. In line3 it just casts x, bigger than $2^{31} - 1$(int type's positive limitation), from long to int first which will lose information, while in line4 x mod 10 first which get a number less than $(2^{31} - 1)$.

2. However, it isn't so sure that num $\neq$ numb absolutely. Now we look at the exact value of x. Considering that int type is 4 bytes long while long type is 8 bytes long, the cast may just take source's lower 4 bytes as result.

3. As we know integers are stored in computer as 2's complement and x = 4850000102_{dec} = $1211520e6_{\text{hex}}$, so in computer x is `0x00000001211520e6` as long type, and `0x211520e7` as int type the latter one is 555032806_{dec}. $555032806_{\text{dec}} \bmod 10 = 6 \neq 4850000102 \bmod 10 = 2$.

2. Visualization of allocation

```
1  boolean b;
2  boolean[] facts = new boolean[3];
3  int[][] jaggeredArray = { {1 , 2, 3} , {1, 2} , {3, 4, 5, 6, 7, 8}, new int[10] };
```
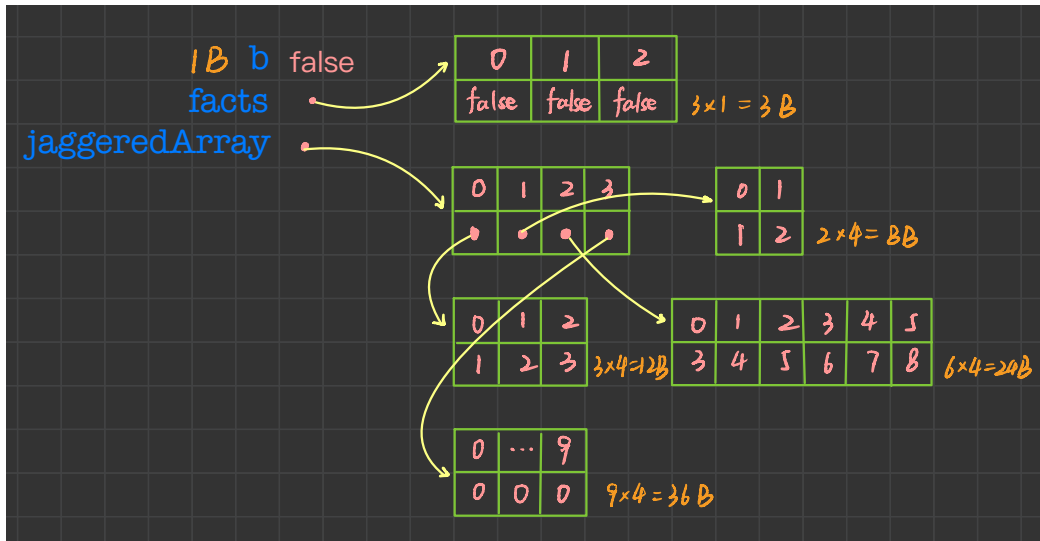
图 1: Problem2

Other things

- The figure style in problem2 refers to Java Visualizer.

- LATEX code refer to these things and was complied on texlive2020.

  – UCB-CS70's given homework template.

  – A free website useful to edit LATEX formula code.

- The purpose of writing in English is to adapt to bilingual teaching and to improve my poor English writing skills in preparation for a possible future exchange program.

  Thanks for your correcting and grading :).