第 1 章　Decisions（选择结构）

1.1　Key points of this chapter（本章要点）

1.	The if Statement：The if statement is used to implement a decision. When a condition is fulfilled, one set of statements is executed. Otherwise, another set of statements is executed.
	if 语句：使用 if 语句来实现一个决定。当条件满足时，执行一组语句。否则，执行另一组语句。

```
if (condition)
{
statements
}
if (condition) { statements1 }
else { statements2 }
```

2.	Nested Branches：It is often necessary to include an if statement inside another. Such an arrangement is called a nested set of statements.
	嵌套分支：将一个 if 语句包含在另一个 if 语句内，这通常是必要的。这样的结构被称为嵌套的语句。

1.2　Example（例题）

Here is a typical example: In the United States, different tax rates are used depending on the taxpayer's marital status. There are different tax schedules for single and for married taxpayers. Married taxpayers add their income together and pay taxes on the total. Table 1 gives the tax rate computations. A different tax rate applies to each "bracket". In this schedule, the income in the first bracket is taxed at 10 percent, and the income in the second bracket is taxed at 25 percent. The income limits for each bracket depend on the marital status.
一个典型的例子：在美国，不同的税率是根据纳税人的婚姻状况而决定的。单身和已婚的纳税人有不同的税收计划。已婚的纳税人将他们的收入加在一起，并支付总的税。表 1-1 给出了税率计算。不同税率适用于每一个“分支”。在表中，第一个分支的收入为 10%，第二分支的收入为百分之 25%。每个分支的收入范围取决于婚姻状况。

税率表见表 1-1。

Table1-1　Tax Rate Schedule

If your status is Single and if the taxable income is	the tax is	of the amount over
at most $32,000	10%	$0
over $32,000	$3,200 + 25%	$32,000
If your status is Married and if the taxable income is	the tax is	of the amount over
at most $64,000	10%	$0
over $64,000	$6,400 + 25%	$64,000

```
import java.util.Scanner;
/**
   This program computes income taxes, using a simplified tax schedule.
*/
public class TaxCalculator
{
   public static void main(String[] args)
   {
      final double RATE1 = 0.10;
      final double RATE2 = 0.25;
      final double RATE1_SINGLE_LIMIT = 32000;
      final double RATE1_MARRIED_LIMIT = 64000;
      double tax1 = 0;
      double tax2 = 0;
      // Read income and marital status
      Scanner in = new Scanner(System.in);
      System.out.print("Please enter your income: ");
      double income = in.nextDouble();
      System.out.print("Please enter s for single, m for married: ");
      String maritalStatus = in.next();
      // Compute taxes due
      if (maritalStatus.equals("s"))
      {
         if (income <= RATE1_SINGLE_LIMIT)
         {
            tax1 = RATE1 * income;
         }
         else
         {
            tax1 = RATE1 * RATE1_SINGLE_LIMIT;
            tax2 = RATE2 * (income - RATE1_SINGLE_LIMIT);
         }
      }
      else
      {
         if (income <= RATE1_MARRIED_LIMIT)
         {
            tax1 = RATE1 * income;
```

```
            }
            else
            {
               tax1 = RATE1 * RATE1_MARRIED_LIMIT;
               tax2 = RATE2 * (income - RATE1_MARRIED_LIMIT);
            }
         }
         double totalTax = tax1 + tax2;
         System.out.println("The tax is $" + totalTax);
      }
   }
```

1.3　Experimental contents（实验内容）

1.	Write a program that reads a number between 1,000 and 999,999 from the user, where the user enters a comma in the input. Then print the number without a comma. Here is a sample dialog; the user input is in color: Please enter an integer between 1,000 and 999,999: 23,456 23456 *Hint:* Read the input as a string. Measure the length of the string. Suppose it contains *n* characters. Then extract substrings consisting of the first *n* – 4 characters and the last three characters.
	编写一个程序，为用户读取一个介于 1,000 和 999,999 之间的数字，用户在输入数字中输入了一个逗号。然后打印需要没有逗号的数字。下面是一个示例对话框，用户输入的数值为颜色数值： 请输入一个介于 1,000 和 999,999 之间的整数：23,456 23456 提示：读取输入为字符串。计算字符串的长度。假设它包含 n 个字符。然后提取子字符串组成的第 N – 4 个字符和最后三个字符。
2.	A supermarket awards coupons depending on how much a customer spends on groceries. For example, if you spend $50, you will get a coupon worth eight percent of that amount. The following table shows the percent used to calculate the coupon awarded for different amounts spent. Write a program that calculates and prints the value of the coupon a person can receive based on groceries purchased. Here is a sample run: Please enter the cost of your groceries: 14 You win a discount coupon of $ 1.12. (8% of your purchase)
	一个超市奖励券取决于顾客在商品上花费的多少。例如，如果你花 50 美元，你会得到一张价值 8%的优惠券。表 1-2 的折扣表显示用于计算所花费的不同金额的优惠

	券的百分比。编写一个程序，在一个人购买商品的基础上计算和打印优惠券的值。 示例运行结果： 请输入你的商品成本：14 你赢了 1.12 美元的折扣。（你购买的 8%）

Table 1-2 Discount Schedule

Money Spent（花费）	Coupon Percentage（折扣率）
Less than $10	No coupon
From $10 to $60	8%
More than $60 to $150	10%
More than $150 to $210	12%
More than $210	14%

1.4 Experimental steps（实验步骤）

1.

```
import java.util.Scanner;
public class CharactersTranverse {
    public static void main(String[] args) {
        // TODO Auto-generated method stub
        System.out.print("Please enter an integer between 1,000 and
            999,999:");
        Scanner in=new Scanner(System.in);
        String num=in.next();
        in.close();
        String result="";
        while(num.length()>3){
            result=num.substring(num.length()-3)+result;
            num=num.substring(0,num.length()-4);
        }
        result=num+result;
        System.out.print("The result is "+result);
    }
}
```

2.

```
import java.util.Scanner;
public class Coupon {
    public static void main(String[] args) {
        // TODO Auto-generated method stub
        System.out.print("Please enter the cost of your groceries:");
        Scanner in= new Scanner(System.in);
        double cost=in.nextDouble();
        if(cost<=10){
            System.out.print("Sorry,there is no coupon!");
```

```
            }
            else if(cost>10&&cost<=60){
                System.out.print("You win a discount coupon of $"+ cost*0.08+
                    "(8% of your purchase)!");
            }
            else if(cost>60&&cost<=150){
                System.out.print("You win a discount coupon of $"+ cost*0.1+
                    "(10% of your purchase)!");
            }
            else if(cost>150&&cost<=210){
                System.out.print("You win a discount coupon of $"+ cost*0.12+
                    "(12% of your purchase)!");
            }
            else{
                System.out.print("You win a discount coupon of $"+ cost*0.14+
                    "(14% of your purchase)!");
            }
        }
    }
```

1.5　Experimental result（实验结果）

实验结果如图 1-1 和图 1-2 所示。

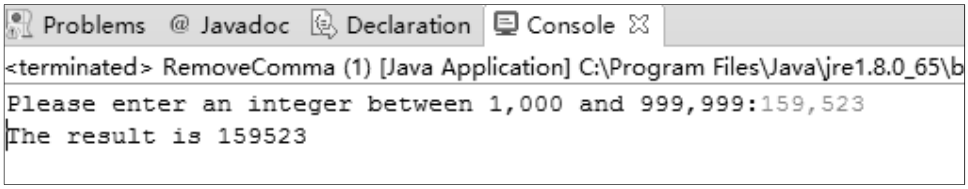

Fig1-1.　CharactersTranverse

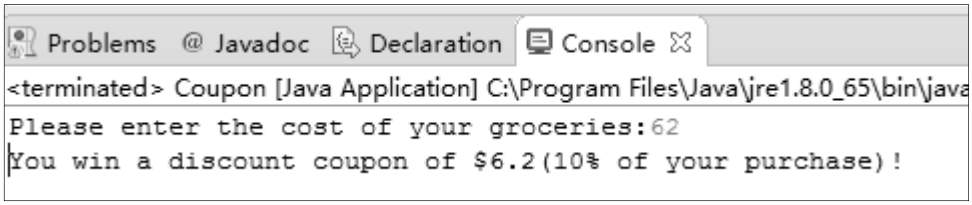

Fig1-2.　Coupon