

Recitation: Loop

Jul 7, 2008

Nested Loop

1. What is the output of the following program? Use pen and paper only.

```
public class Star
{
    public static void main(String [] args)
    {
        for (int i = 6; i >=1 ; i--)
        {
            for (int j = 1; j <= i; j++)
            {
                System.out.print(" * ");
            }
            System.out.println();
        }
    }
}
```

The output is:

```
*****
*****
****
***
**
*
```

2. Test this program in your computer
3. Use "for loops" to create the following grid of numbers. There is a space between two adjacent numbers in each row.

```
1 2 3 4 5
2 3 4 5 6
3 4 5 6 7
4 5 6 7 8
5 6 7 8 9
```

```
// Solution: Refer to the textbook: pp 291 as well
public class grid
{
    public static void main(String [] args)
    {
        for(int row = 1; row <= 5; row++)
        {
            for(int col = 1; col <=5; col++)
            {
                System.out.print(col+row-1); // Output the number
                System.out.print(' '); // Output the space
            }
            System.out.print('\n'); // Go to next line
        }
    }
}
```

•

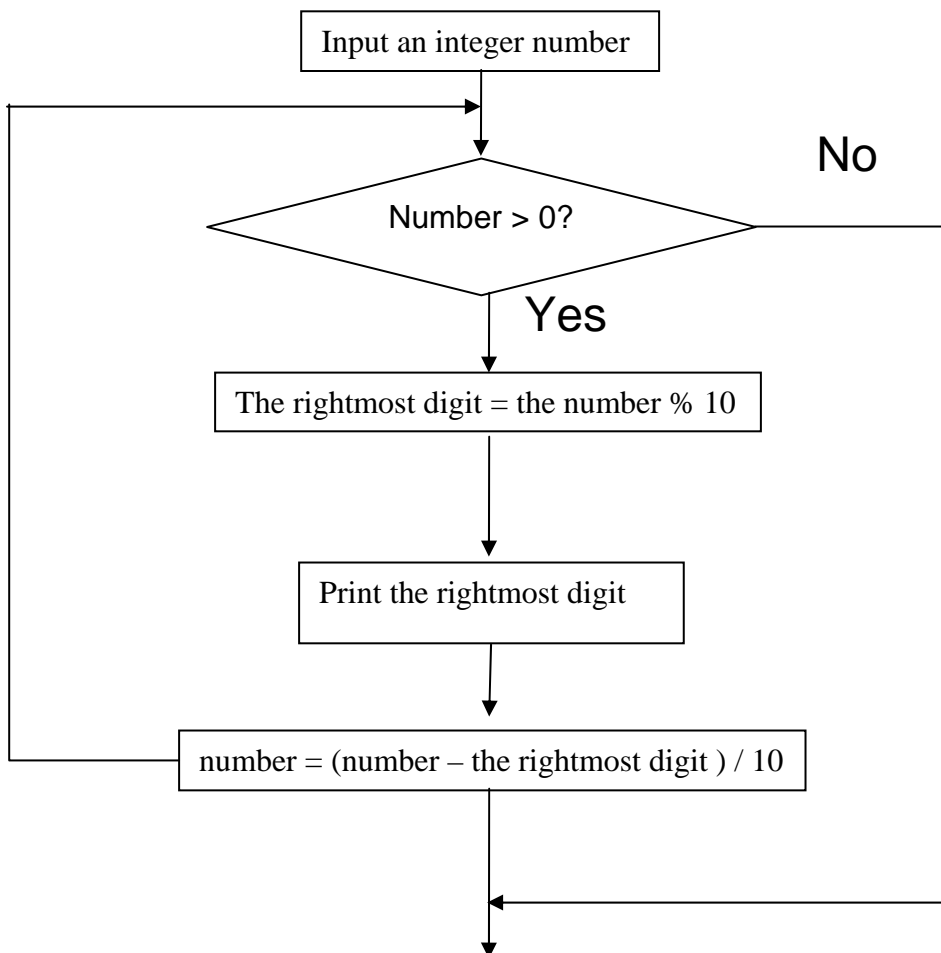
Integer Number

4. Write a program that prompts the user to input a positive integer and then outputs the number with digits reversed. For example:

- If the input is 12345, the output should be 54321
- If the input is 5000, the output should be 0005

Hint: in order to get the rightmost digit of a positive integer, use the modulus operator %. For example the rightmost digit of the number 12345 is 5 since $12345 \% 10 = 5$.

a. Design an algorithm to solve this problem



b. Implement your algorithm using Java language

c. Test your implementation

Checking Account Balance

A local bank in your town is looking for someone to write a program that calculates a customer's checking account balance at end of each month. The data is stored in a file in the following form. A sample file can be downloaded at:

<http://www.cs.unc.edu/~zlj/comp110/Program/467343.txt>

```
467343 23750.40
W 250.00
D 1200.00
W 75.00
W 375.00
D 580.00
I 75.50
...
```

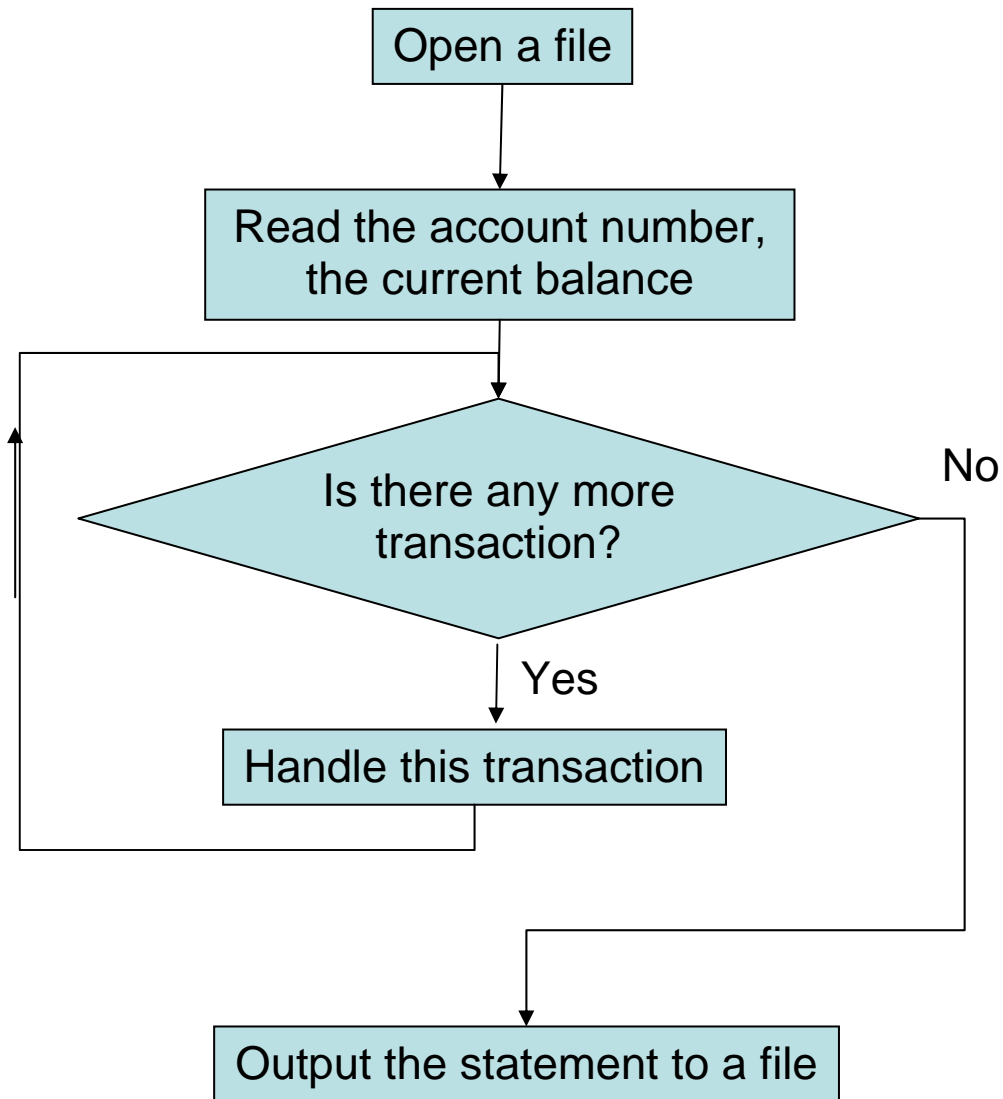
The first line of data shows the account number, followed by the account balance at the beginning of the month. Thereafter, each line has two entries: the transaction code and the transaction amount. The transaction code W or w means withdrawal, D or d means deposit and I or I means interest paid by the bank. The program updates the balance after each transaction. If at any time during the month the balance goes below \$1000.00, a \$25.00 services fee is charged for the month. The program prints the following information: account number, balance at the beginning of the month, balance at the end of the month, interest paid by the bank, total amount of deposit, number of deposits, total amount of withdrawal, number of withdrawals, and service charge if any. Note the output is to be sent to a file, see `statement_theAccountNumber.txt`

Problem analysis

What are the input and output of this problem?

Input	
Output	

Design an algorithm to solve this problem



How to read the input from a file?

FileReader

How to output the results to the file?

PrintWriter

Variables: What variables does the program need?

Variable Name	Data Type	

What are the formulas to calculate the balance?

Which type of selection statement should be used?

Which type of loop statement should being used?

Read from a text file

(<http://www.cs.unc.edu/~zlj/comp110/Program/FileIORead.java>)

```
import java.io.*;
import java.util.*;

public class FileIORead
{
    public static void main(String [] args) throws FileNotFoundException, IOException
    {
        FileReader inFile;
        inFile = new FileReader("D:\\Program\\filename");

        Scanner fileSca;
        fileSca = new Scanner(inFile);

        // Read an integer from the file
        // int i      = fileSca.nextInt();

        // Read a double from the file
        // double d  = fileSca.nextDouble();

        // Read a string from the file
        // String str = fileSca.next();
        // Get the 0th character in the String str;
        // char c = str.charAt(0);

        // Determine whether it is end of the file
        // boolean b = fileSca.hasNext();

        inFile.close();
    }
}
```

Write to a text file

(<http://www.cs.unc.edu/~zlj/comp110/Program/FileIOWrite.java>)

```
import java.io.*;
import java.util.*;

public class FileIOWrite
{
    public static void main(String [] args) throws FileNotFoundException, IOException
    {
        PrintWriter outFile;
        outFile = new PrintWriter("D:\\Program\\filename.txt");

        // Output a line to the file
        outFile.println("It is 2008");

        outFile.close();
    }
}
```