Burton Rosenberg
Midterm

March 4, 2004, 3:05–4:20 PM

There are four problems each worth five points for a total of 20 points. Show all your work, partial credit will be awarded. Space is provided on the test for your work; if you use a blue book for additional workspace, sign it and return it with the test. No notes, no collaboration.

Name: __________________________

<table>
<thead>
<tr>
<th>Problem</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
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<td>4</td>
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</tr>
<tr>
<td>Total</td>
<td></td>
</tr>
</tbody>
</table>
1. Write a class containing a static final boolean HELLO and a main method. The main method prints Hello World if HELLO is true, and Good-bye if HELLO is false.

Answer:

class Hello {

    static final boolean HELLO = true;

    public static void main(String[] args) {
        if (HELLO == true) {
            System.out.println("Hello World");
        } else {
            System.out.println("Good-bye");
        }
    }
}

2. Write a class that sums positive integers input by the user, printing the total and exiting when the user inputs an integer which is zero or negative. For instance,

\[ 3 \]
\[ 6 \]
\[ 1 \]
\[ 0 \]
Total = 10

To get input, just assume that there is a provided method `getInteger()` that returns the value of the integer typed by the user. This method also types the user prompt, that is, the > at the beginning of each line on which the user is to input an integer. Also assume that if the user types in something which is not a number, `getInteger()` returns a zero.

Answer:

```java
class SumIt {

    public static void main ( String [] args ) {

        int total = 0 ;
        int value = getInteger() ;

        while ( value > 0 ) {
            total = total + value ;
            value = getInteger() ;
        }

        System.out.println("total= "+total) ;
    }
}
```
3. Write a class that prints out any integer which is either multiple of 5 or 7, one per line, in ascending order. The largest number it needs to print is set by static final int LARGEST_TO_PRINT. Here is example output when LARGEST_TO_PRINT is set to 22.

5
7
10
14
15
20
21

Answer:

class PrintMultiples {
    static final int LARGEST_TO_PRINT = 22 ;
    public static void main( String [] args ) {
        int i = 0 ;
        while ( i <= LARGEST_TO_PRINT ) {
            if ( i%5==0 ) {
                System.out.println( i ) ;
            } else if ( i%7==0 ) {
                System.out.println( i ) ;
            }
            i++ ;
        }
    }
}
4. Write a recursive method which multiplies two positive integers using the recursion formula:

\[ x \cdot y = \begin{cases} 
0 & \text{if } y == 0 \\
2(x \cdot (y/2)) & \text{if } y \text{ is even} \\
x + x \cdot (y - 1) & \text{if } y \text{ is odd}
\end{cases} \]

You need only show me the static int method which does the recursion. The main method and the enclosing class braces are not important.

Answer:

```java
static int recMult(int x, int y) {
    if ( y==0 ) return 0 ;
    if ( y%2==0 ) {
        int t = recMult(x,y/2) ;
        return t+t ;
    } return x + recMult(x,y-1) ;
}
```