Practice Problems 02 Keywords operators Control Statements.doc

Problem 3:

**3. Consider the following code:**

|  |  |
| --- | --- |
| **1** | **public class quizb** |
| **2** | **{** |
| **3** | **public static void main(String args[])** |
| **4** | **{** |
| **5** | **int x = 0, y =0;** |
| **6** | **int sum = 0;** |
| **7** | **while (x < 10){** |
| **8** | **y = x - 3;** |
| **9** | **while (y < 3){** |
| **10** | **sum = (sum % 3) + x - y \* 3 ;** |
| **11** | **System.out.println(sum);** |
| **12** | **y = y + 1;** |
| **13** | **}** |
| **14** | **if (x > 5){** |
| **15** | **x++;** |
| **16** | **}else{** |
| **17** | **x += 2;** |
| **18** | **}** |
| **19** | **}** |
| **20** | **}** |
| **21** | **}** |

**What are the values of sum that will be printed in line 11?**

Line 7: while (x < 10){

Line 7: while (0 < 10){

condition true, going inside of 1st while loop

Line 8: y = x - 3;

Line 8: y = 0 - 3;

Line 8: y = -3;

Line 8: y became -3;

Line 9: while (y < 3){

Line 9: while (-3 < 3){

condition true, going inside of 2nd while loop

Line 10: sum = (sum % 3) + x - y \* 3 ;

Line 10: sum = (0 % 3) + 0 - -3 \* 3 ;

Line 10: sum = 00 - -3 \* 3 ;

Line 10: sum = 00 - -9;

Line 10: sum = 0 - -9;

Line 10: sum = 9;

LINE 11: 9

Line 12: y was -3 becomes -2

condition true, going inside of 2nd while loop

Line 10: sum = (sum % 3) + x - y \* 3 ;

Line 10: sum = (9 % 3) + 0 - -2 \* 3 ;

Line 10: sum = 00 - -2 \* 3 ;

Line 10: sum = 00 - -6;

Line 10: sum = 0 - -6;

Line 10: sum = 6;

LINE 11: 6

Line 12: y was -2 becomes -1

condition true, going inside of 2nd while loop

Line 10: sum = (sum % 3) + x - y \* 3 ;

Line 10: sum = (6 % 3) + 0 - -1 \* 3 ;

Line 10: sum = 00 - -1 \* 3 ;

Line 10: sum = 00 - -3;

Line 10: sum = 0 - -3;

Line 10: sum = 3;

LINE 11: 3

Line 12: y was -1 becomes 0

condition true, going inside of 2nd while loop

Line 10: sum = (sum % 3) + x - y \* 3 ;

Line 10: sum = (3 % 3) + 0 - 0 \* 3 ;

Line 10: sum = 00 - 0 \* 3 ;

Line 10: sum = 00 - 0;

Line 10: sum = 0 - 0;

Line 10: sum = 0;

LINE 11: 0

Line 12: y was 0 becomes 1

condition true, going inside of 2nd while loop

Line 10: sum = (sum % 3) + x - y \* 3 ;

Line 10: sum = (0 % 3) + 0 - 1 \* 3 ;

Line 10: sum = 00 - 1 \* 3 ;

Line 10: sum = 00 - 3;

Line 10: sum = 0 - 3;

Line 10: sum = -3;

LINE 11: -3

Line 12: y was 1 becomes 2

condition true, going inside of 2nd while loop

Line 10: sum = (sum % 3) + x - y \* 3 ;

Line 10: sum = (-3 % 3) + 0 - 2 \* 3 ;

Line 10: sum = 00 - 2 \* 3 ;

Line 10: sum = 00 - 6;

Line 10: sum = 0 - 6;

Line 10: sum = -6;

LINE 11: -6

Line 12: y was 2 becomes 3

Line 9: 3 is not less than 3

condition false, going outside of 2nd while loop

Line 14: if (x > 5){

Line 14: if (0 > 5){

condition false, executing else part

Line 17: x was 0 becomes 2

condition true, going inside of 1st while loop

Line 8: y = x - 3;

Line 8: y = 2 - 3;

Line 8: y = -1;

Line 8: y became -1;

Line 9: while (y < 3){

Line 9: while (-1 < 3){

condition true, going inside of 2nd while loop

Line 10: sum = (sum % 3) + x - y \* 3 ;

Line 10: sum = (-6 % 3) + 2 - -1 \* 3 ;

Line 10: sum = 02 - -1 \* 3 ;

Line 10: sum = 02 - -3;

Line 10: sum = 2 - -3;

Line 10: sum = 5;

LINE 11: 5

Line 12: y was -1 becomes 0

condition true, going inside of 2nd while loop

Line 10: sum = (sum % 3) + x - y \* 3 ;

Line 10: sum = (5 % 3) + 2 - 0 \* 3 ;

Line 10: sum = 22 - 0 \* 3 ;

Line 10: sum = 22 - 0;

Line 10: sum = 4 - 0;

Line 10: sum = 4;

LINE 11: 4

Line 12: y was 0 becomes 1

condition true, going inside of 2nd while loop

Line 10: sum = (sum % 3) + x - y \* 3 ;

Line 10: sum = (4 % 3) + 2 - 1 \* 3 ;

Line 10: sum = 12 - 1 \* 3 ;

Line 10: sum = 12 - 3;

Line 10: sum = 3 - 3;

Line 10: sum = 0;

LINE 11: 0

Line 12: y was 1 becomes 2

condition true, going inside of 2nd while loop

Line 10: sum = (sum % 3) + x - y \* 3 ;

Line 10: sum = (0 % 3) + 2 - 2 \* 3 ;

Line 10: sum = 02 - 2 \* 3 ;

Line 10: sum = 02 - 6;

Line 10: sum = 2 - 6;

Line 10: sum = -4;

LINE 11: -4

Line 12: y was 2 becomes 3

Line 9: 3 is not less than 3

condition false, going outside of 2nd while loop

Line 14: if (x > 5){

Line 14: if (2 > 5){

condition false, executing else part

Line 17: x was 2 becomes 4

condition true, going inside of 1st while loop

Line 8: y = x - 3;

Line 8: y = 4 - 3;

Line 8: y = 1;

Line 8: y became 1;

Line 9: while (y < 3){

Line 9: while (1 < 3){

condition true, going inside of 2nd while loop

Line 10: sum = (sum % 3) + x - y \* 3 ;

Line 10: sum = (-4 % 3) + 4 - 1 \* 3 ;

Line 10: sum = -1+4 - 1 \* 3 ;

Line 10: sum = -1+4 - 3;

Line 10: sum = 3 - 3;

Line 10: sum = 0;

LINE 11: 0

Line 12: y was 1 becomes 2

condition true, going inside of 2nd while loop

Line 10: sum = (sum % 3) + x - y \* 3 ;

Line 10: sum = (0 % 3) + 4 - 2 \* 3 ;

Line 10: sum = 04 - 2 \* 3 ;

Line 10: sum = 04 - 6;

Line 10: sum = 4 - 6;

Line 10: sum = -2;

LINE 11: -2

Line 12: y was 2 becomes 3

Line 9: 3 is not less than 3

condition false, going outside of 2nd while loop

Line 14: if (x > 5){

Line 14: if (4 > 5){

condition false, executing else part

Line 17: x was 4 becomes 6

condition true, going inside of 1st while loop

Line 8: y = x - 3;

Line 8: y = 6 - 3;

Line 8: y = 3;

Line 8: y became 3;

Line 9: while (y < 3){

Line 9: while (3 < 3){

Line 9: 3 is not less than 3

condition false, going outside of 2nd while loop

Line 14: if (x > 5){

Line 14: if (6 > 5){

condition true, executing if part

Line 15: x was 6 becomes 7

condition true, going inside of 1st while loop

Line 8: y = x - 3;

Line 8: y = 7 - 3;

Line 8: y = 4;

Line 8: y became 4;

Line 9: while (y < 3){

Line 9: while (4 < 3){

Line 9: 4 is not less than 3

condition false, going outside of 2nd while loop

Line 14: if (x > 5){

Line 14: if (7 > 5){

condition true, executing if part

Line 15: x was 7 becomes 8

condition true, going inside of 1st while loop

Line 8: y = x - 3;

Line 8: y = 8 - 3;

Line 8: y = 5;

Line 8: y became 5;

Line 9: while (y < 3){

Line 9: while (5 < 3){

Line 9: 5 is not less than 3

condition false, going outside of 2nd while loop

Line 14: if (x > 5){

Line 14: if (8 > 5){

condition true, executing if part

Line 15: x was 8 becomes 9

condition true, going inside of 1st while loop

Line 8: y = x - 3;

Line 8: y = 9 - 3;

Line 8: y = 6;

Line 8: y became 6;

Line 9: while (y < 3){

Line 9: while (6 < 3){

Line 9: 6 is not less than 3

condition false, going outside of 2nd while loop

Line 14: if (x > 5){

Line 14: if (9 > 5){

condition true, executing if part

Line 15: x was 9 becomes 10

Line 7: 10 is not less than 10

condition false, going outside of 1st while loop