**Loop Conditional Statements**

Assignment

# Evaluating Loop Expressions:

For each program, summarize each iteration of the loop and record changes to the variables inside the loop:

Example:

int i=0;

while (i + 3 > 2 \* i) {

i = i + 1;

}

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Code | 1st Iteration | 2nd Iteration | 3rd Iteration | 4th Iteration |
| while (i + 3 > 2 \* i) { | (0+3 > 2\*0) -> (3 > 0) -> (true) | (1+3 > 2\*1) -> (4 > 2) -> (true) | (2+3 > 2\*2) -> (5 > 4) -> (true) | (3+3 > 2\*3) -> (6 > 6) -> (false) |
| i = i + 1; | i = 0 + 1 -> i = 1 | i = 1 + 1 -> i = 2 | i = 2 + 1 -> i = 3 | Skipped |

Loop Problem #1:

int i=5;

int j=1;

while (i > j) {

i = i - 1;

j = j + 1;

}

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Code | 1st Iteration | 2nd Iteration | 3rd Iteration | 4th Iteration | 5th Iteration | 6th Iteration | 7th Iteration |
| while (i > j) { |  |  |  |  |  |  |  |
| i = i - 1; |  |  |  |  |  |  |  |
| j = j + 1; |  |  |  |  |  |  |  |

Loop Problem #2:

int x=1;

while (x < 16) {

x = x \* 2;

}

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Code | 1st Iteration | 2nd Iteration | 3rd Iteration | 4th Iteration | 5th Iteration | 6th Iteration | 7th Iteration |
| while (x < 16) { |  |  |  |  |  |  |  |
| x = x \* 2; |  |  |  |  |  |  |  |

Loop Problem #3:

int i=10;

boolean b=true;

while (i > 0 && b) {

i = i - 1;

if (i==8) {

b = false;

}

}

|  |  |  |  |
| --- | --- | --- | --- |
| Code | 1st Iteration | 2nd Iteration | 3rd Iteration |
| while (i > 0 && b) { |  |  |  |
| i = i - 1; |  |  |  |
| if (i==8) { |  |  |  |
| b = false; |  |  |  |
| } |  |  |  |

Loop Problem #4:

int a=1;

int b=32;

while (b - a > 0) {

a = a \* 2;

b = b / 2;

}

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Code | 1st Iteration | 2nd Iteration | 3rd Iteration | 4th Iteration |
| while (b - a > 0) { |  |  |  |  |
| a = a \* 2; |  |  |  |  |
| b = b / 2; |  |  |  |  |

Loop Problem #5:

int y=5;

int z=4;

while (y \* z < 3 \* y + z) {

y = y \* z + z;

z = y \* z;

}

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Code | 1st Iteration | 2nd Iteration | 3rd Iteration | 4th Iteration |
| while (y \* z < 3 \* y + z) { |  |  |  |  |
| y = y \* z + z; |  |  |  |  |
| z = y \* z; |  |  |  |  |