

Exercise # 7 Solution

(14-11-2001)

Exercise 1:

- a. *Loop Entry*: The point at which the flow of control reaches the first statement inside a loop.
- b. *Iteration*: An individual pass through, or repetition of, the body of a loop.
- c. *Loop Test*: The point at which the condition expression is evaluated and the decision is made either to begin a new iteration or skip to the statement immediately following the loop.
- d. *Loop Exit*: The point at which the repetition of the loop body ends and control passes to the first statement following the loop.
- e. *Termination Condition*: The condition that causes a loop to be exited.

Exercise 2:

What is the output of this nested loop structure?

```
i = 4;
while (i >= 1)
{
    j = 2;
    while (j >= 1)
    {
        cout << j << " ";
        j--;
    }
    cout << i << endl;
    i--;
}
```

```
2 1 4
2 1 3
2 1 2
2 1 1
```

Exercise 3:

The following code segment is supposed to write out the even numbers between 1 and 15. (n is an int variable). It has two flaws in it.

```
n = 2;
while (n != 15)
{
    n = n + 2;
    cout << n << ' ';
}
```

- a. What is the output of the code as written?

Infinite loop

- b. Correct the code so that it works as intended.

```
n = 2;
while (n < 15)
{
    cout << n << ' ';
    n = n + 2;
}
```

Exercise 4:

Given the following for loop:

```
for (k = 9; k <= 21; k++)
    cout << k << ' ' << 3*k << endl;
```

- a. Rewrite the loop using a do-while loop.

```
k = 9;
do {
    cout << k << ' ' << 3*k << endl;
    k++;
} while (k <= 21);
```

- b. Rewrite the loop using a while loop.

```
k = 9;
while (k <= 21)
{
    cout << k << ' ' << 3*k << endl;
    k++;
}
```

Exercise 5:

What is printed by the following program fragment? (All variables are of type int.)

```
for (k = 4; k >= 1; k--)  
{  
    for (j = k; j >= 1; j--)  
        cout << j << ' '  
        cout << k << endl;  
}
```

4 3 2 1 4

3 2 1 3

2 1 2

1 1

Exercise 6:

What is printed by the following program fragment, assuming the input value is 0?
(All variables are of type int.)

```
cin >> n;  
j = 1;  
do  
{  
    cout << j;  
    j++;  
} while (j <= n);
```

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