Tutorial - Week 4

Objectives: To practice with

- for, while, do…while repetition statements

1. **What is displayed by this program fragment for an input of 8?**

```
scanf("%d", &n);
ev = 0;
while (ev < n) {
    printf("%3d", ev);
    ev = ev + 2;
}
printf("\n");
```

Output:

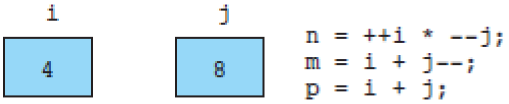
2. **Write a program fragment that produces this output:**

```
0   1
1   2
2   4
3   8
4  16
5  32
6  64
```

3. **Where possible, write equivalents for the following statements using compound assignment operators:**

```
a. s = s / 5;
b. q = q * n + 4;
c. z = z - x * y;
d. t = t + (u % v);
```

4. What values are assigned to n, m, and p, given these initial values?



```
n = ++i * --j;
m = i + j--;
p = i + j;
```

5. What errors do you see in the following fragment? Correct the code so it displays all multiples of 4 from 0 through 100.

```
for mult4 = 0;
mult4 < 100;
mult4 += 4;
printf("%d\n", mult4);
```

6. Show the output displayed by these nested loops:

```
for (i = 0; i < 3; ++i) {
  printf("Outer %4d\n", i);
  for (j = 0; j < 2; ++j) {
        printf(" Inner%3d%3d\n", i, j);
     }
  for (k = 2; k > 0; --k) {
        printf(" Inner%3d%3d\n", i, k);
     }
}
```

7. Write nests of loops that cause the following output to be displayed:

```
0
0 1
0 1 2
0 1 2 3
0 1 2 3 4
0 1 2 3 4 5
0 1 2 3 4
0 1 2 3
0 1 2
0 1
0
```

8. Rewrite the following code using a do-while statement with no decisions in the loop body:

```
sum = 0;
for (odd = 1; odd < n; odd = odd + 2)
  sum = sum + odd;
printf("Sum of the positive odd numbers less than %d is
     %d\n", n, sum);
```

In what situations will the rewritten code print an incorrect sum?

9. Design an interactive input loop that scans pairs of integers until it reaches a pair in which the first integer evenly divides the second.

10. What does the following code segment display? Try each of these inputs: 345, 82, 6. Then, describe the action of the code.

```
printf (“\n Enter a positive integer> “);
sacnf(“%d”, &num);
do {


        printf("%d ", num % 10);
        num /=  10;
} while (num > 0);
printf("\n");
```

11. Write a do-while loop that repeatedly prompts for and takes input until a value in the range 0 through 15 inclusive is input. Include code that prevents the loop from executing forever on input of a wrong data type.