Introduction to Computer Science
Tutorial 3: While and Do-While Loops, Logic Operators

1. Manual execution

1.1. Your task is to perform the manual execution of the following programs with iteration.

```
/* 1.1 */
int i = 0;
int a = 0;
while (i <= 5){
    a = a + i;
    i = i + 1;
}
```

```
/* 1.2 */
int i = 0;
int a = 0;
while (i < 4){
  if (i % 2 == 0)
    a = a + 1;
  else
    a = a - 1;
  i = i + 1;
}
```

```
/* 1.3 */
int i = 0;
int a = 8;
do {
  i = i + 5;
  a = a - 3;
} while (i < a);
```

```
/* 1.4 */
int b = 7;
int c = 0;
if (b > 9 || c < 5)
  c = c + 1;
else if (b > 5)
  c = c + 2;
else
  c = c + 3;
}
```

```
/* 1.5 */
int a = 10;
int c = 0;
if (a <= 10){
  while(a > 0)
    a = a - 5;
  c = c + 2;
}
```

2. Printing sequences

2.1 Write a program that prints the sequence of numbers from 1 to 50 in steps of 7.

2.2 Write a program that asks for values a, b, c to the user, and prints out the values from a to b in steps of c

3. Input validation

3.1. Write a program that asks for an integer value x to the user, such that x belongs to the interval [0,100]. If the user provides a negative value or a value greater than 100, the program asks for another value. Then, the program prints out the number of digits in x.

Consider using a do-while statement, when appropriate.

4. A Program with Some Errors

4.1 The following C program compiles without error but it does not behave as expected. It is expected that the authorized variable is set to 1 only in the cases in which the age of the person allows for it (age should be greater than or equal to 17, to get authorization).

Your task is to fix the program.

```c
int main() {
    int age;              // Get from input.
                          // Age must be between 0 and 120.
    int authorized = 0;   // 0 by default. Change to 1 to authorize.

    do{
        scanf("%d", &age);
    } while (0 <= age <= 120);


    if (age < 16){
        printf("Cannot authorize.\n");
    } else if (age = 17) {
        printf("Authorized with warning.\n");
    } else {
        printf("Authorized.\n");
    }

    authorized = 1;

    return 0;
}
```