

1. You can write program codes like this:

```

/*
 * C program that says "Hello, World!" (hello_world.c)
 */
#include <stdio.h>    // needed to perform IO operations

int main() {          // program entry point
    printf("Hello, World!\n"); // say Hello, World!
    return 0;         // terminate main()
}                    // end of main function

```

2. Symbols and formulas:

$$\sum_{k=0}^{n-1} 2^k = ? \text{ and } \sum_{k=0}^{n-1} 2^k = ?$$

Assume that the initial vertical velocity is 0 at time 0, and $g = 9.8$ is the gravitational acceleration. The falling vertical velocity v_y at time t is

$$v_y = gt$$

The falling vertical distance s at time t is

$$s = \int_0^t v_y dt = \int_0^t gt dt = \frac{1}{2}gt^2$$

$$(x + y)^i = \sum_{j=0}^i \binom{i}{j} x^{i-j} y^j$$

$$\binom{i}{j} = C_j^i = {}_i C_j = \frac{i!}{j!(i-j)!}$$

$$\binom{i}{j+1} = \frac{i!}{(j+1)!(i-(j+1))!} = \binom{i}{j} (i-j) / (j+1)$$

$\binom{i}{0} = 1$, we can calculate $\binom{i}{j+1}$ from $\binom{i}{j}$ for $j = 0, 1, \dots, i$.