Introductory example

look at the following problem:

Input: a string `w` consisting of 0s and 1s

Question: Are these requirements fullfilled?

- 1 is not a sub-word
- `w` is divisible by 3 in binary

Examples: `0101, 1001, 00110, 0101010`

We want:

A program that takes `w` as argument and returns 0 or 1

A possible solution (cryptic C code)

```
int F[] = { 1, 0, 0, 0, 1, 0, 0 };
int delta[][2] = { { 0, 1 }, { 3, 6 }, { 3, 4 }, { 2, 5 }, { 0, 6 }, { 2, 6 }, { 6, 6 }  };

int three_not_11(char *w)
{
    int q = 0;
    while( *w ) q = delta[ q ][ *w++ - '0' ];
    return F[q];
}
```

Finite Automaton

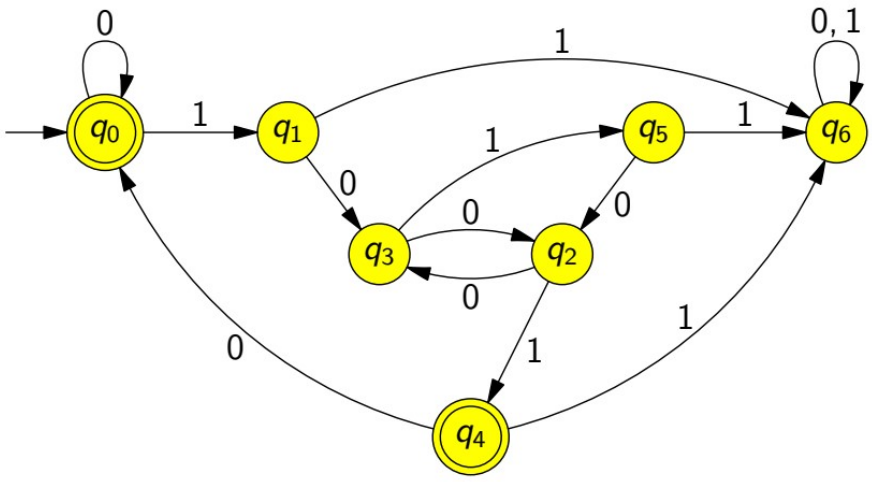

Figure 1: “Finite Automaton”

q0 is start q6 is default false (11 is sub-word) q1-q5 are possible paths q0 & q4 are true paths