State in *C++*

Back to **State** description

```
        State design pattern - an FSM with two states and two events
(distributed transition logic - logic in the derived state classes).
```

```cpp
#include <iostream>
using namespace std;
class Machine
{
  class State *current;
  public:
    Machine();
    void setCurrent(State *s)
    {
        current = s;
    }
    void on();
    void off();
};

class State
{
  public:
    virtual void on(Machine *m)
    {
        cout << "   already ON\n";
    }
    virtual void off(Machine *m)
    {
        cout << "   already OFF\n";
    }
};

void Machine::on()
{
  current->on(this);
}

void Machine::off()
{
  current->off(this);
}

class ON: public State
{
  public:
    ON()
    {
        cout << "   ON-ctor ";
    };
    ~ON()
    {
        cout << "   dtor-ON\n";
    };
    void off(Machine *m);
};

class OFF: public State
{
  public:
    OFF()
    {
        cout << "   OFF-ctor ";
    };
    ~OFF()
    {
        cout << "   dtor-OFF\n";
    };
    void on(Machine *m)
    {
        cout << "   going from OFF to ON";
        m->setCurrent(new ON());
        delete this;
    }
};
```

feedback

```
void ON::off(Machine *m)
{
  cout << "   going from ON to OFF";
  m->setCurrent(new OFF());
  delete this;
}

Machine::Machine()
{
  current = new OFF();
  cout << '\n';
}

int main()
{
  void(Machine:: *ptrs[])() =
  {
    Machine::off, Machine::on
  };
  Machine fsm;
  int num;
  while (1)
  {
    cout << "Enter 0/1: ";
    cin >> num;
    (fsm. *ptrs[num])();
  }
}
```

Output

```
   OFF-ctor
Enter 0/1: 0
   already OFF
Enter 0/1: 1
   going from OFF to ON   ON-ctor    dtor-OFF
Enter 0/1: 1
   already ON
Enter 0/1: 0
   going from ON to OFF   OFF-ctor    dtor-ON
Enter 0/1: 1
   going from OFF to ON   ON-ctor    dtor-OFF
Enter 0/1: 0
   going from ON to OFF   OFF-ctor    dtor-ON
Enter 0/1: 0
   already OFF
Enter 0/1:
```

Code examples

Java	State in Java: Before and after	State in Java	State in Java	State in Java	State in Java: Distributed transition logic	State in Java: Case statement considered harmful	State in Java
C++	State in C++						
PHP	State in PHP						
Delphi	State in Delphi	State in Delphi					
Python	State in Python						

feedback