HW04

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[Coffee.h]
```cpp
#ifndef COFFEE_H
#define COFFEE_H
#include "Material.h"

class Coffee : public Material {
public:
        Coffee();
};
#endif
```

[Coffee.cpp]
```cpp
#include "Coffee.h"

Coffee::Coffee() {
        name = "Coffee";
        amount = 3;
}
```

[Cream.h]
```cpp
#ifndef CREAM_H
#define CREAM_H
#include "Material.h"

class Cream : public Material {
public:
        Cream();
};
#endif
```

[[Cream.cpp]
```cpp
#include "Cream.h"

Cream::Cream() {
        name = "Cream";
        amount = 3;
}
```

[Cup.h]
```cpp
#ifndef CUP_H
#define CUP_H
#include "Material.h"

class Cup : public Material {
public:
        Cup();
};
#endif
```

[Cup.cpp]
```cpp
#include "Cup.h"

Cup::Cup() {
        name = "Cup";
        amount = 3;
}
```

[Machine.h]
```cpp
#ifndef Machine_H
#define Machine_H
#include "Material.h"

class Machine {
        Material* mat[5];
public:
        Machine();
        ~Machine();
        void showMachineState();
        void start();
        void showMenu();
```

```cpp
        int selectMenu();
};
#endif
```

[Machine.cpp]

```cpp
#include <iostream>
#include <iomanip>
#include "Machine.h"
#include "Coffee.h"
#include "Sugar.h"
#include "Cream.h"
#include "Water.h"
#include "Cup.h"
using namespace std;

Machine::Machine() {
        cout << "-----명품 커피 자판기 켭니다.-----" << endl;
        mat[0] = new Coffee();
        mat[1] = new Sugar();
        mat[2] = new Cream();
        mat[3] = new Water();
        mat[4] = new Cup();
        showMachineState();
        cout << endl;
}

Machine::~Machine() {
        for (int i = 0; i < 5; i++) {
                delete mat[i];
        }
}

void Machine::showMachineState() {
        for (int i = 0; i < 5; i++) {
                cout << setw(10) << mat[i]->getName();
                for (int j = 0; j < mat[i]->getAmount(); j++) {
                        cout << "*";
                }
                cout << endl;
        }
}
```

```cpp
void Machine::start() {
    int num;
    while (true) {
        showMenu();
        num = selectMenu();
        if (num == 3) {
            for (int i = 0; i < 5; i++) {
                mat[i]->setAmount(3);
            }
            cout << "모든 통을 채웁니다~~" << endl;
            showMachineState();
            cout << endl;
            continue;
        }
        else if (num == 4) {
            cout << "프로그램을 종료합니다." << endl;
            exit(0);
        }

        if (mat[0]->subAmount(1) == false) {
            showMachineState();
            continue;
        }
        if (mat[3]->subAmount(1) == false) {
            showMachineState();
            continue;
        }
        if (mat[4]->subAmount(1) == false) {
            showMachineState();
            continue;
        }

        switch (num) {
        case 0:
            if (mat[2]->subAmount(1) == false) {
                showMachineState();
                continue;
            }
            cout << "맛있는 보통 커피 나왔습니다~~" << endl;
            showMachineState();
```

```cpp
                    cout << endl;
                    break;
            case 1:
                    if (mat[1]->subAmount(1) == false) {
                            showMachineState();
                            continue;
                    }
                    cout << "맛있는 설탕 커피 나왔습니다~~" << endl;
                    showMachineState();
                    cout << endl;
                    break;
            case 2:
                    cout << "맛있는 블랙 커피 나왔습니다~~" << endl;
                    showMachineState();
                    break;
            }
        }
}

void Machine::showMenu() {
        cout << "보통 커피:0, 설탕 커피:1, 블랙 커피:2, 채우기:3, 종료:4>> ";
}

int Machine::selectMenu() {
        int num;
        cin >> num;
        return num;
}
```

[Material.h]
```cpp
#ifndef MATERIAL_H
#define MATERIAL_H
#include <string>

class Material {
protected:
        std::string name;
        int amount;
public:
        std::string getName();
        int getAmount();
```

```cpp
        void setAmount(int amount);
        bool subAmount(int amount);
};
#endif
```

[Material.cpp]
```cpp
#include "Material.h"

std::string Material::getName() {
        return name;
}

int Material::getAmount() {
        return amount;
}

void Material::setAmount(int amount) {
        this->amount = amount;
}

bool Material::subAmount(int amount) {
        if (this->amount <= 0) {
                return false;
        }
        else {
                this->amount -= amount;
                return true;
        }
}
```

[Sugar.h]
```cpp
#ifndef SUGAR_H
#define SUGAR_H

#include "Material.h"

class Sugar : public Material {
public:
        Sugar();
};
```

[Sugar.cpp]
```cpp
#include "Sugar.h"

Sugar::Sugar() {
        name = "Sugar";
        amount = 3;
}
```
[Water.h]
```cpp
#ifndef WATER_H
#define WATER_H
#include "Material.h"

class Water : public Material {
public:
        Water();
};

#endif
```
[Water.cpp]
```cpp
#include "Water.h"

Water::Water() {
        name = "Water";
        amount = 3;
}
```

[main.cpp]
```cpp
#include <iostream>
#include "Machine.h"
using namespace std;

int main() {
        cout.setf(ios::left);
        Machine c;
        c.start();

        return 0;
}
```

[실행결과]

```
-----명품 커피 자판기 컵니다.-----
Coffee    ***
Sugar     ***
Cream     ***
Water     ***
Cup       ***

보통 커피:0, 설탕 커피:1, 블랙 커피:2, 채우기:3, 종료:4>> 1
맛있는 설탕 커피 나왔습니다~~
Coffee    **
Sugar     **
Cream     ***
Water     **
Cup       **

보통 커피:0, 설탕 커피:1, 블랙 커피:2, 채우기:3, 종료:4>> 1
맛있는 설탕 커피 나왔습니다~~
Coffee    *
Sugar     *
Cream     ***
Water     *
Cup       *

보통 커피:0, 설탕 커피:1, 블랙 커피:2, 채우기:3, 종료:4>> 3
모든 통을 채웁니다~~
Coffee    ***
Sugar     ***
Cream     ***
Water     ***
Cup       ***

보통 커피:0, 설탕 커피:1, 블랙 커피:2, 채우기:3, 종료:4>>
```