**Composite Pattern Example: Menu**

**Class: MenuComponent**

**package** composite.menu;

**import** java.util.\*;

**public** **abstract** **class** MenuComponent {

**public** **void** add(MenuComponent menuComponent) {

**throw** **new** UnsupportedOperationException();

}

**public** **void** remove(MenuComponent menuComponent) {

**throw** **new** UnsupportedOperationException();

}

**public** MenuComponent getChild(**int** i) {

**throw** **new** UnsupportedOperationException();

}

**public** String getName() {

**throw** **new** UnsupportedOperationException();

}

**public** String getDescription() {

**throw** **new** UnsupportedOperationException();

}

**public** **double** getPrice() {

**throw** **new** UnsupportedOperationException();

}

**public** **boolean** isVegetarian() {

**throw** **new** UnsupportedOperationException();

}

**public** **void** print() {

**throw** **new** UnsupportedOperationException();

}

}

**Class: Menu**

**package** composite.menu;

**import** java.util.Iterator;

**import** java.util.ArrayList;

**public** **class** Menu **extends** MenuComponent {

ArrayList menuComponents = **new** ArrayList();

String name;

String description;

**public** Menu(String name, String description) {

**this**.name = name;

**this**.description = description;

}

**public** **void** add(MenuComponent menuComponent) {

menuComponents.add(menuComponent);

}

**public** **void** remove(MenuComponent menuComponent) {

menuComponents.remove(menuComponent);

}

**public** MenuComponent getChild(**int** i) {

**return** (MenuComponent)menuComponents.get(i);

}

**public** String getName() {

**return** name;

}

**public** String getDescription() {

**return** description;

}

**public** **void** print() {

System.***out***.print("\n" + getName());

System.***out***.println(", " + getDescription());

System.***out***.println("---------------------");

Iterator iterator = menuComponents.iterator();

**while** (iterator.hasNext()) {

MenuComponent menuComponent =

(MenuComponent)iterator.next();

menuComponent.print();

}

}

}

**Class: Waitress**

**package** composite.menu;

**import** java.util.Iterator;

**public** **class** Waitress {

MenuComponent allMenus;

**public** Waitress(MenuComponent allMenus) {

**this**.allMenus = allMenus;

}

**public** **void** printMenu() {

allMenus.print();

}

}

**Class: MenuItem**

package composite.menu;

import java.util.Iterator;

import java.util.ArrayList;

public class MenuItem extends MenuComponent {

String name;

String description;

boolean vegetarian;

double price;

public MenuItem(String name,

String description,

boolean vegetarian,

double price)

{

this.name = name;

this.description = description;

this.vegetarian = vegetarian;

this.price = price;

}

public String getName() {

return name;

}

public String getDescription() {

return description;

}

public double getPrice() {

return price;

}

public boolean isVegetarian() {

return vegetarian;

}

public void print() {

System.out.print(" " + getName());

if (isVegetarian()) {

System.out.print("(v)");

}

System.out.println(", " + getPrice());

System.out.println(" -- " + getDescription());

}

}

**Class: MenuTestDrive**

**package** composite.menu;

**import** java.util.\*;

**public** **class** MenuTestDrive {

**public** **static** **void** main(String args[]) {

MenuComponent pancakeHouseMenu =

**new** Menu("PANCAKE HOUSE MENU", "Breakfast");

MenuComponent dinerMenu =

**new** Menu("DINER MENU", "Lunch");

MenuComponent cafeMenu =

**new** Menu("CAFE MENU", "Dinner");

MenuComponent dessertMenu =

**new** Menu("DESSERT MENU", "Dessert of course!");

MenuComponent coffeeMenu = **new** Menu("COFFEE MENU", "Stuff to go with your afternoon coffee");

MenuComponent allMenus = **new** Menu("ALL MENUS", "All menus combined");

allMenus.add(pancakeHouseMenu);

allMenus.add(dinerMenu);

allMenus.add(cafeMenu);

pancakeHouseMenu.add(**new** MenuItem(

"K&B's Pancake Breakfast",

"Pancakes with scrambled eggs, and toast",

**true**,

2.99));

pancakeHouseMenu.add(**new** MenuItem(

"Regular Pancake Breakfast",

"Pancakes with fried eggs, sausage",

**false**,

2.99));

pancakeHouseMenu.add(**new** MenuItem(

"Blueberry Pancakes",

"Pancakes made with fresh blueberries, and blueberry syrup",

**true**,

3.49));

pancakeHouseMenu.add(**new** MenuItem(

"Waffles",

"Waffles, with your choice of blueberries or strawberries",

**true**,

3.59));

dinerMenu.add(**new** MenuItem(

"Vegetarian BLT",

"(Fakin') Bacon with lettuce & tomato on whole wheat",

**true**,

2.99));

dinerMenu.add(**new** MenuItem(

"BLT",

"Bacon with lettuce & tomato on whole wheat",

**false**,

2.99));

dinerMenu.add(**new** MenuItem(

"Soup of the day",

"A bowl of the soup of the day, with a side of potato salad",

**false**,

3.29));

dinerMenu.add(**new** MenuItem(

"Hotdog",

"A hot dog, with saurkraut, relish, onions, topped with cheese",

**false**,

3.05));

dinerMenu.add(**new** MenuItem(

"Steamed Veggies and Brown Rice",

"Steamed vegetables over brown rice",

**true**,

3.99));

dinerMenu.add(**new** MenuItem(

"Pasta",

"Spaghetti with Marinara Sauce, and a slice of sourdough bread",

**true**,

3.89));

dinerMenu.add(dessertMenu);

dessertMenu.add(**new** MenuItem(

"Apple Pie",

"Apple pie with a flakey crust, topped with vanilla icecream",

**true**,

1.59));

dessertMenu.add(**new** MenuItem(

"Cheesecake",

"Creamy New York cheesecake, with a chocolate graham crust",

**true**,

1.99));

dessertMenu.add(**new** MenuItem(

"Sorbet",

"A scoop of raspberry and a scoop of lime",

**true**,

1.89));

cafeMenu.add(**new** MenuItem(

"Veggie Burger and Air Fries",

"Veggie burger on a whole wheat bun, lettuce, tomato, and fries",

**true**,

3.99));

cafeMenu.add(**new** MenuItem(

"Soup of the day",

"A cup of the soup of the day, with a side salad",

**false**,

3.69));

cafeMenu.add(**new** MenuItem(

"Burrito",

"A large burrito, with whole pinto beans, salsa, guacamole",

**true**,

4.29));

cafeMenu.add(coffeeMenu);

coffeeMenu.add(**new** MenuItem(

"Coffee Cake",

"Crumbly cake topped with cinnamon and walnuts",

**true**,

1.59));

coffeeMenu.add(**new** MenuItem(

"Bagel",

"Flavors include sesame, poppyseed, cinnamon raisin, pumpkin",

**false**,

0.69));

coffeeMenu.add(**new** MenuItem(

"Biscotti",

"Three almond or hazelnut biscotti cookies",

**true**,

0.89));

Waitress waitress = **new** Waitress(allMenus);

waitress.printMenu();

}

}

Result:

ALL MENUS, All menus combined

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PANCAKE HOUSE MENU, Breakfast

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K&B's Pancake Breakfast(v), 2.99

-- Pancakes with scrambled eggs, and toast

Regular Pancake Breakfast, 2.99

-- Pancakes with fried eggs, sausage

Blueberry Pancakes(v), 3.49

-- Pancakes made with fresh blueberries, and blueberry syrup

Waffles(v), 3.59

-- Waffles, with your choice of blueberries or strawberries

DINER MENU, Lunch

---------------------

Vegetarian BLT(v), 2.99

-- (Fakin') Bacon with lettuce & tomato on whole wheat

BLT, 2.99

-- Bacon with lettuce & tomato on whole wheat

Soup of the day, 3.29

-- A bowl of the soup of the day, with a side of potato salad

Hotdog, 3.05

-- A hot dog, with saurkraut, relish, onions, topped with cheese

Steamed Veggies and Brown Rice(v), 3.99

-- Steamed vegetables over brown rice

Pasta(v), 3.89

-- Spaghetti with Marinara Sauce, and a slice of sourdough bread

DESSERT MENU, Dessert of course!

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Apple Pie(v), 1.59

-- Apple pie with a flakey crust, topped with vanilla icecream

Cheesecake(v), 1.99

-- Creamy New York cheesecake, with a chocolate graham crust

Sorbet(v), 1.89

-- A scoop of raspberry and a scoop of lime

CAFE MENU, Dinner

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Veggie Burger and Air Fries(v), 3.99

-- Veggie burger on a whole wheat bun, lettuce, tomato, and fries

Soup of the day, 3.69

-- A cup of the soup of the day, with a side salad

Burrito(v), 4.29

-- A large burrito, with whole pinto beans, salsa, guacamole

COFFEE MENU, Stuff to go with your afternoon coffee

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Coffee Cake(v), 1.59

-- Crumbly cake topped with cinnamon and walnuts

Bagel, 0.69

-- Flavors include sesame, poppyseed, cinnamon raisin, pumpkin

Biscotti(v), 0.89

-- Three almond or hazelnut biscotti cookies