**BÁO CÁO BÀI TẬP KIỂM THỬ**

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1. **Đặt bài toán:**

Viết chương trình tính tổng giá trị hóa đơn mua hàng của một cửa hàng quần áo, biết cửa hàng đang có chương trình khuyến mãi như sau:

- Mua trên 1,000,000 đồng được giảm 5% tổng hóa đơn

- Mua trên 5,000,000 đồng được giảm 7% tổng hóa dơn

- Mua trên 10,000,000 đồng được giảm 10% tổng hóa đơn

Bên cạnh đó, cửa hàng còn có chương trình giảm giá cho khách hàng vip như sau:

- Khách hàng bình thường: không giảm giá

- Khách hàng VIP1: giảm giá 5% tổng hóa đơn

- Khách hàng VIP2: giảm giá 10% tổng hóa đơn

1. **Báo cáo kiểm thử hộp đen:**

Đầu vào chương trình nhận nhận 2 giá trị:

- hoa\_don >= 0 kiểu Int (đơn vị: nghìn VNĐ)

- khach\_hang: “vip1”, “vip2”, “norm” kiểu String

Đầu ra của chương trình là số tiền khách hàng phải trả.

1. Kiểm thử lớp tương đương:

- Phân hoạch:

hoa\_don: [0; 1,000) U [1,000; 5,000) U [5,000; 10,000) U [10,000; IntMax]

khach\_hang: {“vip1”} U {“vip2”} U {“norm”}

=> Kiểm thử lớp tương đương mạnh cần ít nhất 12 ca kiểm thử.

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| --- | --- | --- | --- | --- |
| Test case | Input | Exp O | F/P? | Why failed |
| 1 | hoa\_don = 500  khach\_hang = “vip1” | 475 | Passed |  |
| 2 | hoa\_don = 1,000  khach\_hang = “vip1” | 950 | Failed | Do hoa\_don > 1000 trong khi cần hoa\_don >= 1000 => Đã sửa |
| 3 | hoa\_don = 5,000  khach\_hang = “vip1” | 4,400 | Passed |  |
| 4 | hoa\_don = 10,000  khach\_hang = “vip1” | 8,500 | Passed |  |
| 5 | hoa\_don = 500  khach\_hang = “vip2” | 450 | Passed |  |
| 6 | hoa\_don = 1,000  khach\_hang = “vip2” | 850 | Passed |  |
| 7 | hoa\_don = 5,000  khach\_hang = “vip2” | 4,150 | Passed |  |
| 8 | hoa\_don = 10,000  khach\_hang = “vip2” | 8,000 | Passed |  |
| 9 | hoa\_don = 500  khach\_hang = “norm” | 500 | Passed |  |
| 10 | hoa\_don = 1,000  khach\_hang = “norm” | 950 | Passed |  |
| 11 | hoa\_don = 5,000  khach\_hang = “norm” | 4,650 | Passed |  |
| 12 | hoa\_don = 10,000  khach\_hang = “norm” | 9,000 | Passed |  |

1. Kiểm thử bảng quyết định:

Xác định điều kiện và hành động:

* C1: Khách bình thường?
* C2: Khách vip1?
* C3: Khách vip 2?
* C4: 0 <= Hoá đơn < 1,000
* C5: 1,000 <= Hoá đơn < 5,000
* C6: 5,000 <= Hoá đơn < 10,000
* C7: Hoá đơn >= 10,000
* E1: Không giảm giá
* E2: Giảm giá vip1
* E3: Giảm giá vip2
* E4: Giảm giá hoá đơn trên 1,000
* E5: Giảm giá hoá đơn trên 5,000
* E6: Giảm giá hoá đơn trên 10,000

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| R |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Điều kiện | C1: Khách hàng bình thường? | T | T | T | T | F | F | F | F | F | F | F | F |
| C2: Khách hàng Vip1? | - | - | - | - | T | T | T | T | F | F | F | F |
| C3: Khách hàng Vip 2? | - | - | - | - | - | - | - | - | T | T | T | T |
| C4: 0 <= Hoá đơn < 1,000 | T | F | F | F | T | F | F | F | T | F | F | F |
| C5: 1,000 <= Hoá đơn < 5,000 | - | T | F | F | - | T | F | F | - | T | F | F |
| C6: 5,000 <= Hoá đơn < 10,000 | - | - | T | F | - | - | T | F | - | - | T | F |
| C7: Hoá đơn >= 10,000 | - | - | - | T | - | - | - | T | - | - | - | T |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hành động | E1: Không giảm giá | X |  |  |  |  |  |  |  |  |  |  |  |
| E2: Giảm giá vip1 |  |  |  |  | X | X | X | X |  |  |  |  |
| E3: Giảm giá vip2 |  |  |  |  |  |  |  |  | X | X | X | X |
| E4: Giảm giá hoá đơn trên 1,000 |  | X |  |  |  | X |  |  |  | X |  |  |
| E5: Giảm giá hoá đơn trên 5,000 |  |  | X |  |  |  | X |  |  |  | X |  |
| E6: Giảm giá hoá đơn trên 10,000 |  |  |  | X |  |  |  | X |  |  |  | X |

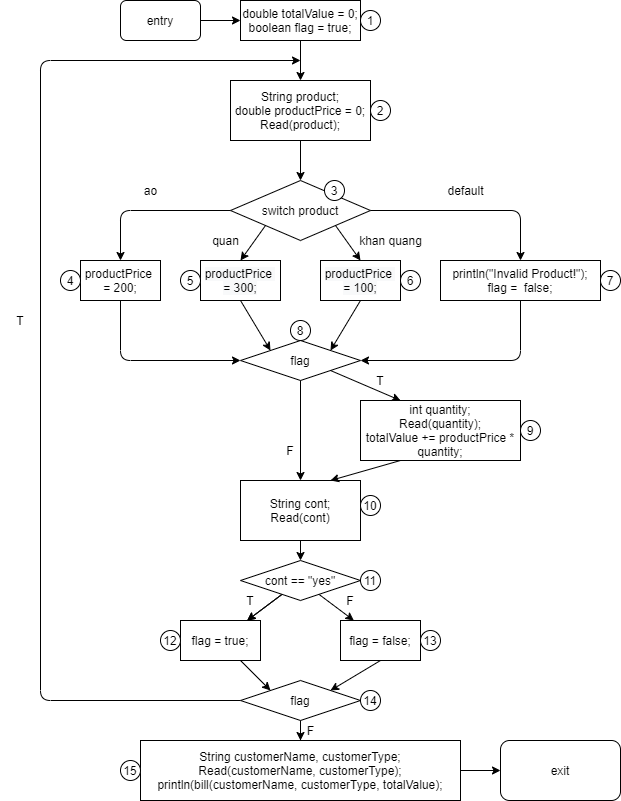
* Cần 12 ca kiểm thử (tương tự phương pháp kiểm thử lớp tương đương mạnh)

1. **Báo cáo kiểm thử dòng điều khiển:**

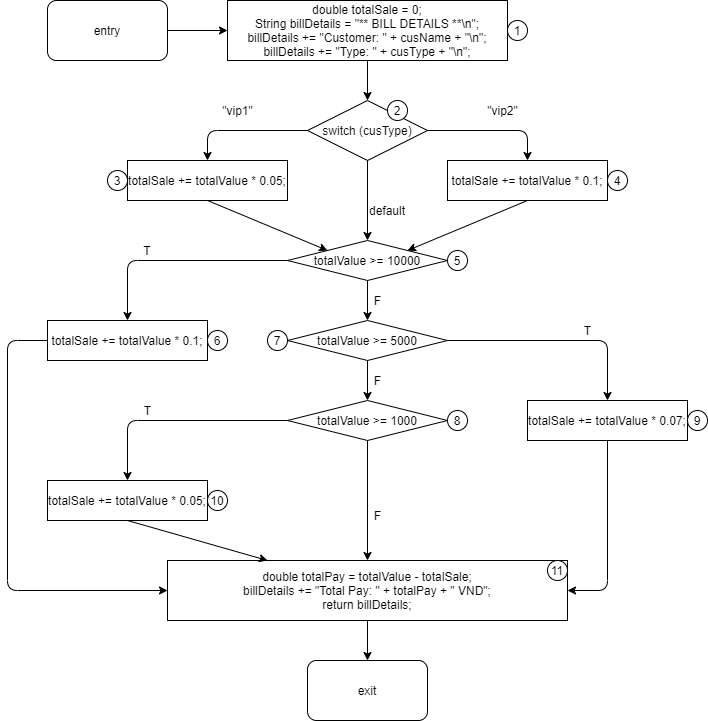
Chương trình gồm 2 hàm:

* main(String args[])
* bill(String cusName, String cusType, double totalValue)

1. Đồ thị dòng điều khiển (CFG):



*Hình 1: CFG của hàm main().*



*Hình 2: CFG của hàm* bill(String cusName, String cusType, double totalValue)*.*

1. Đường đi của CFG với độ phủ cấp 2:

* CFG của hàm main() có các đường đi như sau:
* entry, 1, 2, 3(“ao”), 4 , 8(T), 9, 10, 11(T), 12, 14(T), 2, 3(“quan”), 4 , 8(T), 9, 10, 11(T), 12, 14(T), 2, 3(“khan quang”), 4 , 8(T), 9, 10, 11(T), 12, 14(T), 2, 3(default), 7, 8(F), 11(F), 13, 14(F), 15, exit.

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| TC | Input | Exp Output | Passed/Failed? |
| 1 | “ao”, 2, “yes”, “quan”, 1, “yes”, “khan quang”, 3, “yes”, “mu”, “no” | totalValue = 1,000,000 | Failed: totalValue = 700,000. Nhập product = “khan quang” thì chương trình in ra “Invalid product!”, do hàm scanner.next() ở dòng 42 không cho phép nhập chuỗi có khoảng trắng. (Đã sửa) |

* CFG của hàm bill(String cusName, String cusType, double totalValue) có các đường đi như sau:
* entry, 1, 2(“vip1”), 3, 5(T), 6, 11, exit.
* entry, 1, 2(“vip2”), 4, 5(F), 7(T), 9, 11, exit.
* entry, 1, 2(default), 5(F), 7(F), 8(T), 10, 11, exit.
* entry, 1, 2(default), 5(F), 7(F), 8(F), 11, exit.

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| --- | --- | --- | --- |
| TC | Input | Exp Output | Passed/Failed? |
| 1 | bill (“A”, “vip1”, 10000) | totalSale = 1,500  totalPay = 8,500 | Passed |
| 2 | bill (“A”, “vip2”, 5000) | totalSale = 850  totalPay = 4,150 | Passed |
| 3 | bill (“A”, “norm”, 1000) | totalSale = 50  totalPay = 950 | Passed |
| 4 | bill (“A”, “norm”, 500) | totalSale = 0  totalPay = 500 | Passed |

1. **Báo cáo kiểm thử dòng dữ liệu:**

* Đồ thị luồng dữ liệu (DFG): *Hình dưới*
* Kiểm thử với độ phủ all c-uses/some p-uses:

- Biến totalValue: def = {1, 10}; p-use: {22, 24, 26}; c-use: {10, 20, 21, 23, 25, 27, 28}

- Biến flag: def = {1,7, 13, 14}; p-use: {8, 15}; c-use: {}

- Biến product: def = {2}; p-use: {3}; c-use: {}

- Biến productPrice: def = {2, 4, 5, 6}; p-use: {8, 15}; c-use: {10}

- Biến quantity: def = {9}; p-use: {}; c-use: {10}

- Biến cont: def = {11}; p-use: {12}; c-use: {}

- Biến cusName: def = {16}; p-use: {}; c-use: {18}

- Biến cusType: def = {16}; p-use: {19}; c-use: {18}

- Biến totalSale: def = {17, 20, 21, 23, 25, 27}; p-use: {}; c-use: {20, 21, 23, 25, 27, 28}

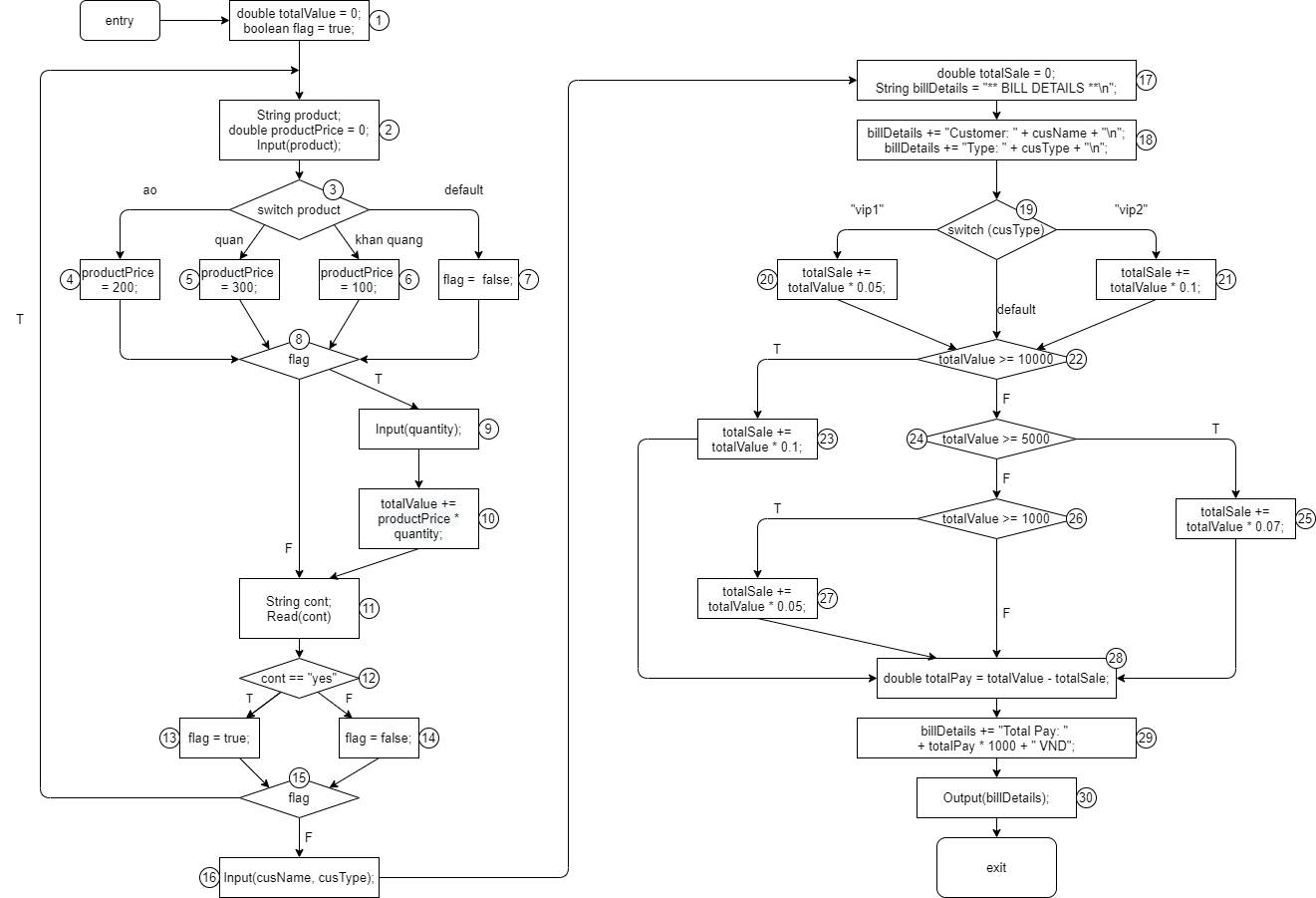
- Biến billDetails: def = {17, 18, 29}; p-use: {}; c-use: {18, 29, 30}

- Biến totayPay: def = {28}; p-use: {}; c-use: {29}

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Du-pair | Def-clear path | Complete path |
| totalValue | (1, 10) | 1, 2, 3(“ao”), 4, 8(T), 9, 10 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25, 28, 29, 30 |
| (1, 20) | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| (1, 21) | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25, 28, 29, 30 |
| (1, 23) | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23, 28, 29, 30 |
| (1, 25) | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25, 28, 29, 30 |
| (1, 27) | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(default), 22(F), 24(F), 26(T), 27 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(default), 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| (1, 28) | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(default), 22(F), 24(F), 26(T), 27, 28 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(default), 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| (10, 10) | 10, 11, 12(T), 13, 15(T), 2, 3(“quan”), 5, 8(T), 9, 10 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(T), 13, 15(T), 2, 3(“quan”), 5, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23, 28, 29, 30 |
| (10, 20) | 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(T), 13, 15(T), 2, 3(“quan”), 5, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23, 28, 29, 30 |
| (10, 21) | 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25, 28, 29, 30 |
| (10, 23) | 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(T), 13, 15(T), 2, 3(“quan”), 5, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23, 28, 29, 30 |
| (10, 25) | 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25, 28, 29, 30 |
| (10, 27) | 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(F), 26(T), 27 | 1, 2, 3(“khan quang”), 6, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| (10, 28) | 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23, 28 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(T), 13, 15(T), 2, 3(“quan”), 5, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23, 28, 29, 30 |
| (7, 8) | 7, 8 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| (13, 15) | 13, 15 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(T), 13, 15(T), 2, 3(“quan”), 5, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23, 28, 29, 30 |
| (14, 15) | 14, 15 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25, 28, 29, 30 |
| product | (2, 3) | 2, 3 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25, 28, 29, 30 |
| (4, 10) | 4, 8(T), 9, 10 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25, 28, 29, 30 |
| (5, 10) | 5, 8(T), 9, 10 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(T), 13, 15(T), 2, 3(“quan”), 5, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23, 28, 29, 30 |
| (6, 10) | 6, 8(T), 9, 10 | 1, 2, 3(“khan quang”), 6, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| quantity | (9, 10) | 9, 10 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| cont | (11, 12) | 11, 12 | 1, 2, 3(“khan quang”), 6, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| cusName | (16, 18) | 16, 17, 18 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| cusType | (16, 18) | 16, 17, 18 | 1, 2, 3(“khan quang”), 6, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| totalSale | (17, 20) | 17, 18, 19(“vip1”), 20 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| (17, 21) | 17, 18, 19(“vip2”), 21 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25, 28, 29, 30 |
| (20, 23) | 20, 22(T), 23 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(T), 13, 15(T), 2, 3(“quan”), 5, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23, 28, 29, 30 |
| (20, 25) | 20, 22(F), 24(T), 25 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(T), 25, 28, 29, 30 |
| (20, 27) | 20, 22(F), 24(F), 26(T), 27 | 1, 2, 3(“khan quang”), 6, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| (20, 28) | 20, 22(F), 24(F), 26(F), 28 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(T), 25, 28, 29, 30 |
| (21, 23) | 21, 22(T), 23 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(T), 23, 28, 29, 30 |
| (21, 25) | 21, 22(F), 24(T), 25 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25, 28, 29, 30 |
| (21, 27) | 21, 22(F), 24(F), 26(T), 27 | 1, 2, 3(“khan quang”), 6, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| (21, 28) | 21, 22(F), 24(F), 26(F), 28 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(F), 26(F), 28, 29, 30 |
| (23, 28) | 23, 28 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(T), 23, 28, 29, 30 |
| (25, 28) | 25, 28 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25, 28, 29, 30 |
| (27, 28) | 27, 28 | 1, 2, 3(“khan quang”), 6, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| billDetails | (17, 18) | 17, 18 | 1, 2, 3(“khan quang”), 6, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| (18, 29) | 18, 19(“vip1”), 20, 22(T), 23, 28, 29 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(T), 13, 15(T), 2, 3(“quan”), 5, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23, 28, 29, 30 |
| (29, 30) | 29, 30 | 1, 2, 3(“khan quang”), 6, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(F), 26(T), 27, 28, 29, 30 |
| totalPay | (28, 29) | 28, 29 | 1, 2, 3(“khan quang”), 6, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(F), 26(T), 27, 28, 29, 30 |

* Có tổng cộng 11 ca kiểm thử (các complete path giống nhau có cùng màu)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| TC | Complete path | Input | Exp Output | Passed/Failed? |
| 1 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25, 28, 29, 30 | product = “ao”; quantity = 1; cont = “no”; cusName = “A”; cusType = “vip2” | \*\* BILL DETAILS \*\*  Customer: A  Type: vip2  Total Pay: 180000 VND | Passed |
| 2 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(F), 26(T), 27, 28, 29, 30 | product = “quan”; quantity = 4; cont = “no”; cusName = “A”; cusType = “vip1” | \*\* BILL DETAILS \*\*  Customer: A  Type: vip1  Total Pay: 1080000 VND | Passed |
| 3 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(T), 25, 28, 29, 30 | product = “quan”; quantity = 20; cont = “no”; cusName = “A”; cusType = “vip2” | \*\* BILL DETAILS \*\*  Customer: A  Type: vip2  Total Pay: 4980000 VND | Passed |
| 4 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23, 28, 29, 30 | product = “quan”; quantity = 35; cont = “no”; cusName = “A”; cusType = “vip1” | \*\* BILL DETAILS \*\*  Customer: A  Type: vip1  Total Pay: 8925000 VND | Passed |
| 5 | 1, 2, 3(“quan”), 5, 8(F), 11, 12(F), 14, 15(F), 16, 17, 18, 19(default), 22(F), 24(F), 26(T), 27, 28, 29, 30 | product = “quan”; quantity = 4; cont = “no”; cusName = “A”; cusType = “norm” | \*\* BILL DETAILS \*\*  Customer: A  Type: norm  Total Pay: 1140000 VND | Passed |
| 6 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(T), 13, 15(T), 2, 3(“quan”), 5, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(T), 23, 28, 29, 30 | product = “ao”; quantity = 25; cont = “yes”; product = “quan”; quantity = 20;  cont = “no”; cusName = “A”; cusType = “vip1” | \*\* BILL DETAILS \*\*  Customer: A  Type: vip1  Total Pay: 9350000 VND | Passed |
| 7 | 1, 2, 3(“khan quang”), 6, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(F), 26(T), 27, 28, 29, 30 | product = “khan quang”; quantity = 10; cont = “no”; cusName = “A”; cusType = “vip1” | \*\* BILL DETAILS \*\*  Customer: A  Type: vip1  Total Pay: 900000 VND | Passed |
| 8 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip1”), 20, 22(F), 24(T), 25, 28, 29, 30 | product = “ao”; quantity = 25; cont = “no”; cusName = “A”; cusType = “vip1” | \*\* BILL DETAILS \*\*  Customer: A  Type: vip1  Total Pay: 4400000 VND | Passed |
| 9 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(T), 23, 28, 29, 30 | product = “ao”; quantity = 50; cont = “no”; cusName = “A”; cusType = “vip2” | \*\* BILL DETAILS \*\*  Customer: A  Type: vip1  Total Pay: 8500000 VND | Passed |
| 10 | 1, 2, 3(“khan quang”), 6, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(F), 26(T), 27, 28, 29, 30 | product = “khan quang”; quantity = 10; cont = “no”; cusName = “A”; cusType = “vip2” | \*\* BILL DETAILS \*\*  Customer: A  Type: vip1  Total Pay: 850000 VND | Passed |
| 11 | 1, 2, 3(“ao”), 4, 8(T), 9, 10, 11, 12(F), 14, 15(F), 16, 17, 18, 19(“vip2”), 21, 22(F), 24(F), 26(F), 28, 29, 30 | product = “ao”; quantity = 1; cont = “no”; cusName = “A”; cusType = “vip2” | \*\* BILL DETAILS \*\*  Customer: A  Type: vip1  Total Pay: 180000 VND | Passed |



*Đồ thị luồng dữ liệu*