**HOẠT ĐỘNG NHÓM THỰC HIỆN**

1. **Bảng phân công công việc**

| **MSSV** | **Họ tên** | **Mô tả công việc**  **được giao** | **Ghi chú** |
| --- | --- | --- | --- |
| 2015722 | Lê Anh Khôi | Nội dung 1: a, b, c  Nội dung 2 | Trưởng nhóm |
| 2015597 | Đoàn Quang Huy | Nội dung 1: d, e, f  Nội dung 2 | Thư ký |
| 2011353 | Trịnh Ngọc Hoàng Anh | Nội dung 1: j, B1, B2  Nội dung 2 |  |
| 2011438 | Hoàng Ngọc Minh Thắng | Nội dung 1: g, h, i  Nội dung 2 |  |

1. **Nội dung thực hiện**

**Nội dung 1: Sử dụng bảng chân trị chứng minh các luật logic căn bản**

1. **10 luật logic căn bản:**
2. **Double negative (Phủ định)**

* ¬ (¬ p) ≡ p

| **p** | **¬ p** | **¬ (¬ p)** |
| --- | --- | --- |
| 0 | 1 | 0 |
| 1 | 0 | 1 |

1. **Associativity (Kết hợp)**

* p ∧ (q ∧ r) ≡ (p ∧ q) ∧ r
* TH 1: p ∧ (q ∧ r)

| **p** | **q** | **r** | **q ∧ r** | **p ∧ (q ∧ r)** |
| --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 |

* TH 2: (p ∧ q) ∧ r

| **p** | **q** | **r** | **p ∧ q** | **(p ∧ q) ∧ r** |
| --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 1 | 0 |
| 1 | 0 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 |

* p ∨ (q ∨ r) ≡ (p ∨ q) ∨ r
* TH 1: p ∨ (q ∨ r)

| **p** | **q** | **r** | **q ∨ r** | **p ∨ (q ∨ r)** |
| --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 1 |
| 0 | 0 | 1 | 1 | 1 |
| 0 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 0 | 1 |
| 1 | 1 | 0 | 1 | 1 |
| 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 |

* TH 2: (p ∨ q) ∨ r

| **p** | **q** | **r** | **p ∨ q** | **(p ∨ q) ∨ r** |
| --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 1 |
| 0 | 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 | 1 |
| 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 |

1. **Commutativity (Giao hoán)**

* p ∧ q ≡ q ∧ p
* TH 1: p ∧ q

| **p** | **q** | **p ∧ q** |
| --- | --- | --- |
| 0 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

* TH 2: q ∧ p

| **p** | **q** | **q ∧ p** |
| --- | --- | --- |
| 0 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

* p **∨** q ≡ q **∨** p
* TH 1: p **∨** q

| **p** | **q** | **p ∨ q** |
| --- | --- | --- |
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 1 |

* TH 2: q **∨** p

| **p** | **q** | **q ∨ p** |
| --- | --- | --- |
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 1 |

1. **Destributivity (Phân phối)**

* p ∧ (q **∨** r) ≡ (p ∧ q) **∨** (p ∧ r)
* TH 1: p ∧ (q **∨** r)

| **p** | **q** | **r** | **q ∨ r** | **p ∧ (q ∨ r)** |
| --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 |
| 0 | 0 | 1 | 1 | 0 |
| 0 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 1 | 1 |
| 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 |

* TH 2: (p ∧ q) **∨** (p ∧ r)

| **p** | **q** | **r** | p ∧ q | p ∧ r | (p ∧ q) **∨** (p ∧ r) |
| --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 1 | 0 | 1 |
| 1 | 0 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |

* p **∨** (q ∧ r) ≡ (p **∨** q) ∧ (p **∨** r)
* TH 1: p **∨** (q ∧ r)

| **p** | **q** | **r** | **q ∧ r** | **p ∨ (q ∧ r)** |
| --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 0 | 1 |
| 1 | 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 |

* TH 2: (p **∨** q) ∧ (p **∨** r)

| **p** | **q** | **r** | **p ∨ q** | **p ∨ r** | **(p ∨ q) ∧ (p ∨ r)** |
| --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 | 0 |
| 0 | 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 | 1 | 1 |
| 1 | 1 | 0 | 1 | 1 | 1 |
| 1 | 0 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 |

1. **De Morgan’s Laws (Luật De Morgan)**

* ¬ (p ∧ q) ≡ ¬p **∨** ¬q
* TH 1: ¬ (p ∧ q)

| **p** | **q** | **p ∧ q** | **¬ (p ∧ q)** |
| --- | --- | --- | --- |
| 0 | 0 | 0 | 1 |
| 0 | 1 | 0 | 1 |
| 1 | 0 | 0 | 1 |
| 1 | 1 | 1 | 0 |

* TH 2: ¬p **∨** ¬q

| **p** | **q** | **¬p** | **¬q** | **¬p ∨ ¬q** |
| --- | --- | --- | --- | --- |
| 0 | 0 | 1 | 1 | 1 |
| 0 | 1 | 1 | 0 | 1 |
| 1 | 0 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 | 0 |

* ¬ (p **∨** q) ≡ ¬p ∧ ¬q
* TH 1: ¬ (p **∨** q)

| **p** | **q** | **p ∨ q** | **¬ (p ∨ q)** |
| --- | --- | --- | --- |
| 0 | 0 | 0 | 1 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 1 | 0 |

* TH 2: ¬p ∧ ¬q

| **p** | **q** | **¬p** | **¬q** | **¬p ∧ ¬q** |
| --- | --- | --- | --- | --- |
| 0 | 0 | 1 | 1 | 1 |
| 0 | 1 | 1 | 0 | 0 |
| 1 | 0 | 0 | 1 | 0 |
| 1 | 1 | 0 | 0 | 0 |

1. **Idempotent (Lũy đẳng)**

* p ∧ p ≡ p

| **p** | **p** | **p ∧ p** |
| --- | --- | --- |
| 0 | 0 | 0 |
| 1 | 1 | 1 |

* p **∨** p ≡ p

| **p** | **p** | **p ∨ p** |
| --- | --- | --- |
| 0 | 0 | 0 |
| 1 | 1 | 1 |

1. **Identity (Trung hòa)**

* p ∧ 1 ≡ p

| **p** | **1** | **p ∧ 1** |
| --- | --- | --- |
| 0 | 1 | 0 |
| 1 | 1 | 1 |

* p **∨** 0 ≡ p

| **p** | **0** | **p ∨ 0** |
| --- | --- | --- |
| 0 | 0 | 0 |
| 1 | 0 | 1 |

1. **Complements (Phần tử bù)**

* p ∧ p̅ ≡ 0

| **p** | **p̅** | **p ∧ p̅** |
| --- | --- | --- |
| 0 | 1 | 0 |
| 1 | 0 | 0 |

* p **∨** p̅ ≡ 1

| **p** | **p̅** | **p** ∨ **p̅** |
| --- | --- | --- |
| 0 | 1 | 1 |
| 1 | 0 | 1 |

1. **Universal bounds (Thống trị)**

* p ∧ 0 ≡ 0

| **p** | **0** | **p ∧ 0** |
| --- | --- | --- |
| 0 | 0 | 0 |
| 1 | 0 | 0 |

* p **∨** 1 ≡ 1

| **p** | **1** | **p ∨ 1** |
| --- | --- | --- |
| 0 | 1 | 1 |
| 1 | 1 | 1 |

1. **Absonption (Hấp thụ)**

* p ∧ (p **∨** q) ≡ p

| **p** | **q** | **p ∨ q** | **p ∧ (p ∨ q)** |
| --- | --- | --- | --- |
| 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 |

* p **∨** (p ∧ q) ≡ p

| **p** | **q** | **p ∧ q** | **p ∨ (p ∧ q)** |
| --- | --- | --- | --- |
| 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 |

1. **Các quy tắc phổ dụng :**
2. **¬ (p → q) ≡ p ∧ ¬q**

* TH 1: ¬ (p → q)

| **p** | **q** | **p → q** | **¬ (p → q)** |
| --- | --- | --- | --- |
| 0 | 0 | 1 | 0 |
| 1 | 1 | 1 | 0 |

* TH 2: p ∧ ¬q

| **p** | **q** | **¬q** | **p ∧ ¬q** |
| --- | --- | --- | --- |
| 0 | 0 | 1 | 0 |
| 1 | 1 | 0 | 0 |

1. **p → q ≡ ¬p ∨ q**

* TH 1: p → q

| **p** | **q** | **p → q** |
| --- | --- | --- |
| 0 | 0 | 1 |
| 1 | 1 | 1 |

* TH 2: ¬p ∨ q

| **p** | **q** | **¬p** | **¬p ∨ q** |
| --- | --- | --- | --- |
| 0 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 |

**Nội dung 2: Cài đặt các phép toán trên tập hợp**