Test Case Handle

Normal Test Cases:

Test ID	Module	Input	Description	Expected Output
UTC-01	User	+66812345678	Lookup known scam number	Shows 60% score, 3 reports, links
UTC-02	User	+66888888888	Lookup unknown SEA number	Not found; optionally reported
UTC-03	User	+19784561234	Lookup foreign number	Flagged: DANGER, report option
UTC-04	User	+66888888888 -> y	Report number as user	Entry added to pending_reports.csv
UTC-05	User	q or Q to exit	q exit to the main menu	Back to main menu
ATC-01	Admin	View formatted	Admin views database	Table displayed
ATC-02	Admin	Add record +66444444444	Admin adds phone	Phone added
ATC-03	Admin	Add edge +66812345678 <-> +66898765432	Admin adds edge	Score recalculated
ATC-04	Admin	Delete +66812345678	Admin deletes record	Record removed
ATC-05	Admin	Delete edge between known phones	Admin deletes edge	Link removed
ATC-06	Admin	Edit +66812345678 to +66811111111	Admin edits phone and score	Data updated
ATC-07	Admin	View pending & Accept	Admin accept into scam numbers record	Move number in pending report into scam number

Test ID	Module	Input	Description	Expected Output
ATC-08	Admin	Analyze phone +6621234567	Admin analyze the phone number	Show 75% score, 4 reports and
ATC-09	Admin	Back to main menu	Press 7 back to admin menu	Goes to admin main menu

Invalid & Edge Input Cases:

Test ID	Module	Input	Description	Expected Output
UTC-06	User	(press Enter)	Empty phone input	"Invalid phone format"
UTC-07	User	8123abc	Incorrectly formatted number	"Invalid phone format"
UTC-08	User	+669999999999 999	Enter SEA number with unknown prefix	"Invalid phone format"
UTC-09	User	+888	Enter too short number	"Invalid phone format"
ATC-10	Admin	Add +6681 <-> +6689 (existing)	Admin adds duplicate edge	"This edge already exists"
ATC-11	Admin	Enter 0	Admin adds record with 0 reports	"Invalid report count"
ATC-12	Admin	Change +6681 to +6689	Admin views database	"Already exists" warning
ATC-13	Admin	Delete +66123456789	Admin adds phone	"Number not found"
ATC-14	Admin	View pending	View pending with no entries	"No pending reports"
ATC-15	Admin	Analyze not existing number	Search the unknown number	"Invalid phone format"

Stress & Unusual Test Cases:

Test ID	Description	Purpose
STC-01	Load 1000 nodes with dense connections (10 edges each)	Graph stress: check DFS/BFS performance
STC-02	Insert 1000 records in hash table	Collision handling & lookup speed
STC-03	Accept 100 entries from pending_reports.csv	Bulk acceptance stability
STC-04	User reports 50 unique numbers	Simulate flood of reports
STC-05	Add duplicate records in CSV then reload	See if system merges or replaces
STC-06	Admin toggles between edit modes with invalid input repeatedly	UI robustness
STC-07	Test with non-SEA Unicode input	Encoding resilience
STC-08	Test phone numbers near max length (+669999999999999999...)	Buffer overflow protection

Phone Number Format Overview

1.) Normalization Rules

Case	Input	Normalized Output	Description
Thai number with 0	0812345678	+66812345678	Replaces leading 0 with +66
Already normalized	+66812345678	+66812345678	Valid
Non-digit symbols	08-1234-5678	+66812345678	Non-digits removed
Invalid input	81234abc	-	Fails normalization

2.) SEA Country Codes Used

```
static const char *SEA_CODES[] = {
    "+66", "+95", "+855", "+856", "+60", "+65",
    "+62", "+63", "+84", "+673", "+670"
};
```

Country	Code	Example
Thailand	+66	+66812345678
Myanmar	+95	+959123456789
Cambodia	+855	+85512345678
Laos	+856	+856201234567
Malaysia	+60	+60123456789
Singapore	+65	+6591234567
Indonesia	+62	+628123456789
Philippines	+63	+639123456789
Vietnam	+84	+84912345678
Brunei	+673	+6731234567
Timor-Leste	+670	+67012345678

3.) Non-SEA Number

Examples:

- US: +1...
- China: +86...
- UK: +44...

System assigns maximum risk score (1.0) immediately to all non-SEA numbers.

4.) Risk Score Categories

Score Range	Label
0.00 – 0.20	VERY LOW
0.21 – 0.40	LOW
0.41 – 0.60	MEDIUM
0.61 – 0.80	HIGH
0.81 – 1.00	SEVERE

5.) Phone Format Logic Summary

- Raw inputs like 081-234-5678 → cleaned to +66812345678
- If +66..., determine:
  - Landline → starts with +662 → base score 0.5
  - Mobile → starts with +668 or others → base score 0.1
- Each report adds +0.05
- Each neighbor adds +0.05 (capped at +0.2)
- Non-SEA = always 1.0