

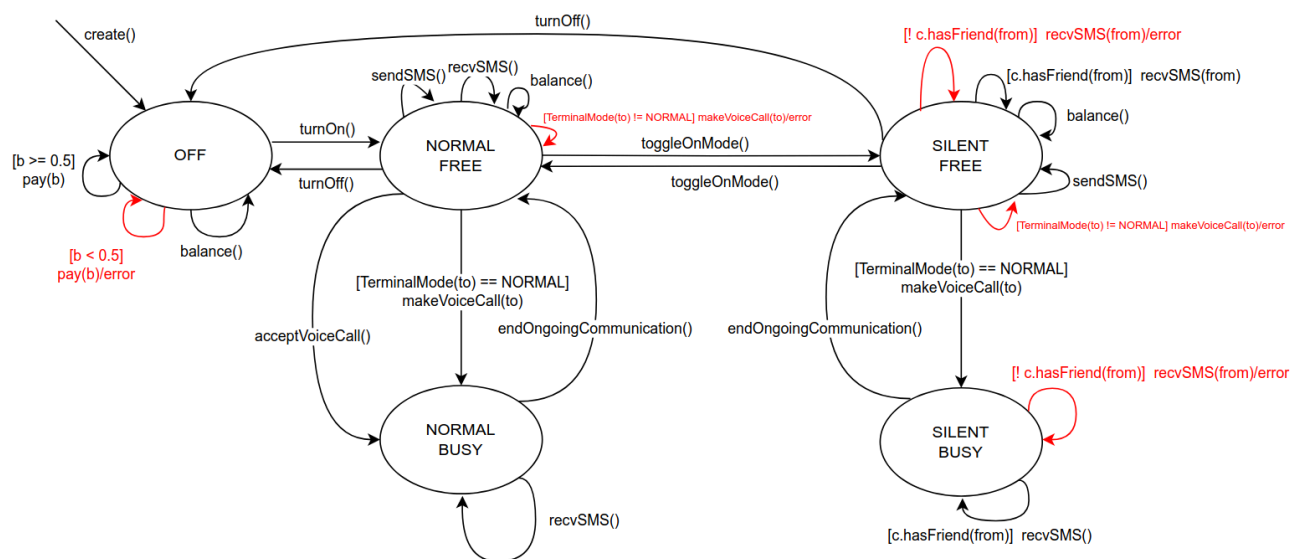


Class Modality

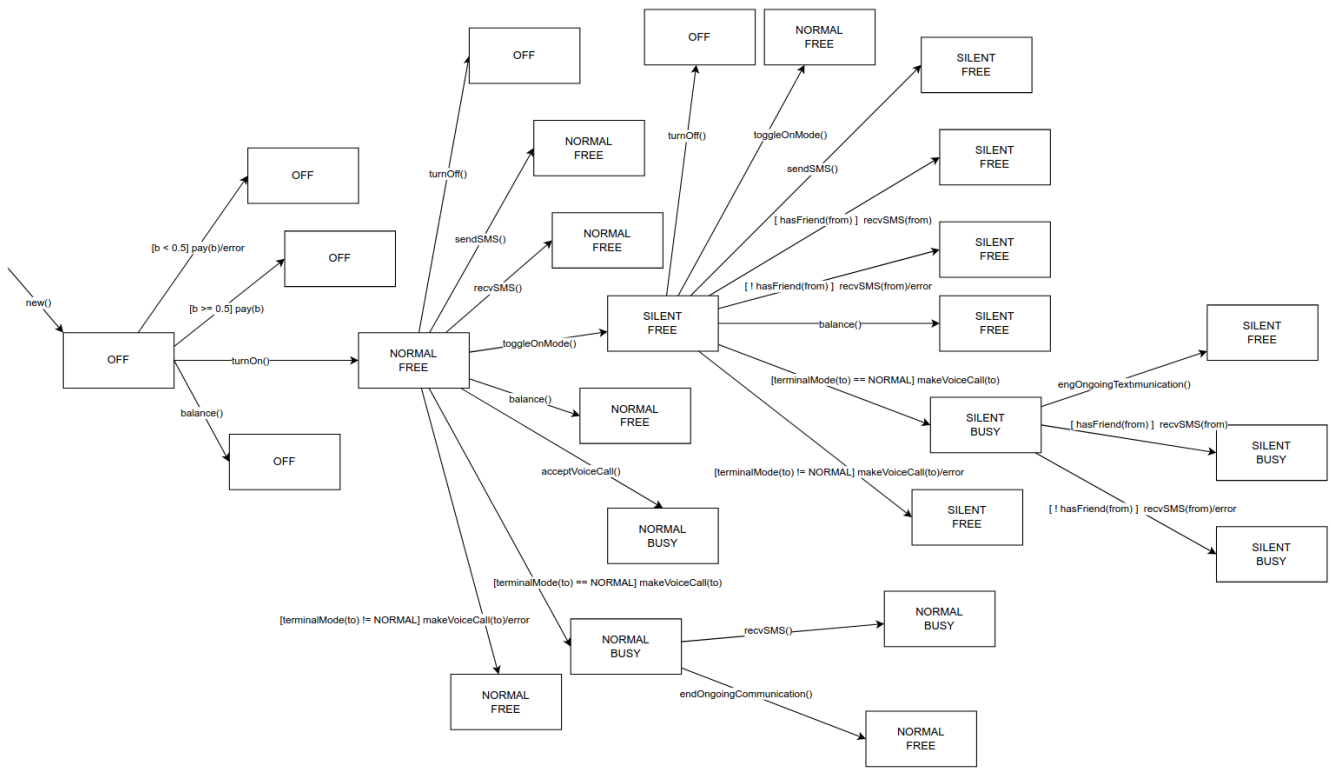
The `Terminal` class is a **modal** class.

Modal Class Test

State Model



Transition Tree



Conformance Test suite

| Run | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Expected Terminal State | Exception |
|-----|---------|------------------------|--|--|---|-------------------------|------------------|
| 1 | new | | | | | OFF | |
| 2 | new | [b < 0.5] pay(b)/error | | | | OFF | InvalidOperation |
| 3 | new | [b >= 0.5] pay(b) | | | | OFF | |
| 4 | new | balance() | | | | OFF | |
| 5 | new | turnOn() | | | | NORMAL FREE | |
| 6 | new | turnOn() | turnOff() | | | OFF | |
| 7 | new | turnOn() | sendSMS() | | | NORMAL FREE | |
| 8 | new | turnOn() | recvSMS() | | | NORMAL FREE | |
| 9 | new | turnOn() | balance() | | | NORMAL FREE | |
| 10 | new | turnOn() | acceptVoiceCall() | | | NORMAL BUSY | |
| 11 | new | turnOn() | [terminalMode(to) != NORMAL] makeVoiceCall(to)/error | | | NORMAL FREE | InvalidOperation |
| 12 | new | turnOn() | [terminalMode(to) == NORMAL] makeVoiceCall(to) | | | NORMAL BUSY | |
| 13 | new | turnOn() | [terminalMode(to) == NORMAL] makeVoiceCall(to) | recvSMS() | | NORMAL BUSY | |
| 14 | new | turnOn() | [terminalMode(to) == NORMAL] makeVoiceCall(to) | endOngoingCommunication() | | NORMAL FREE | |
| 15 | new | turnOn() | toggleOnMode() | | | SILENT FREE | |
| 16 | new | turnOn() | toggleOnMode() | turnOff() | | OFF | |
| 17 | new | turnOn() | toggleOnMode() | toggleOnMode() | | NORMAL FREE | |
| 18 | new | turnOn() | toggleOnMode() | sendSMS() | | SILENT FREE | |
| 19 | new | turnOn() | toggleOnMode() | [hasFriend(from)] recvSMS(from) | | SILENT FREE | |
| 20 | new | turnOn() | toggleOnMode() | [! hasFriend(from)] recvSMS(from)/error | | SILENT FREE | InvalidOperation |
| 21 | new | turnOn() | toggleOnMode() | balance() | | SILENT FREE | |
| 22 | new | turnOn() | toggleOnMode() | [terminalMode(to) != NORMAL] makeVoiceCall(to)/error | | SILENT FREE | InvalidOperation |
| 23 | new | turnOn() | toggleOnMode() | [terminalMode(to) == NORMAL] makeVoiceCall(to) | | SILENT BUSY | |
| 24 | new | turnOn() | toggleOnMode() | [terminalMode(to) == NORMAL] makeVoiceCall(to) | engOngoingCommunication() | SILENT FREE | |
| 25 | new | turnOn() | toggleOnMode() | [terminalMode(to) == NORMAL] makeVoiceCall(to) | [hasFriend(from)] recvSMS(from) | SILENT BUSY | |
| 26 | new | turnOn() | toggleOnMode() | [terminalMode(to) == NORMAL] makeVoiceCall(to) | [! hasFriend(from)] recvSMS(from)/error | SILENT BUSY | InvalidOperation |

Developing Sneak Path Test Suite

Transition Table

| Events / States | OFF | NORMAL FREE | SILENT FREE | NORMAL BUSY | SILENT BUSY |
|-------------------------|-----|-------------|-------------|-------------|-------------|
| pay | ? | PSP | PSP | PSP | PSP |
| balance | | | | PSP | PSP |
| turnOn | | PSP | PSP | PSP | PSP |
| sendSMS | PSP | | | PSP | PSP |
| recvSMS | PSP | | ? | | ? |
| makeVoiceCall | PSP | ? | ? | PSP | PSP |
| acceptVoiceCall | PSP | | | PSP | PSP |
| endOngoingCommunication | PSP | PSP | PSP | | |
| toggleOnMode | PSP | | | PSP | PSP |
| turnOff | PSP | | | PSP | PSP |

= Valid Transition; PSP = Possible sneak path; ? = Conditional Transition

Sneak Path Test Suite

- One test case per PSP
- Should check no change on object state after PSP

| Run | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Expected Terminal State | Exception |
|-----|---------|---------------------------|---------------------------|---------------------------|-------------------|-------------------------|------------------|
| 27 | new | sendSMS() | | | | OFF | InvalidOperation |
| 28 | new | recvSMS() | | | | OFF | InvalidOperation |
| 29 | new | makeVoiceCall() | | | | OFF | InvalidOperation |
| 30 | new | acceptVoiceCall() | | | | OFF | InvalidOperation |
| 31 | new | endOngoingCommunication() | | | | OFF | InvalidOperation |
| 32 | new | toggleOnMode() | | | | OFF | InvalidOperation |
| 33 | new | turnOff() | | | | OFF | InvalidOperation |
| 34 | new | turnOn() | pay() | | | NORMAL FREE | InvalidOperation |
| 35 | new | turnOn() | endOngoingCommunication() | | | NORMAL FREE | InvalidOperation |
| 36 | new | turnOn() | turnOn() | | | NORMAL FREE | InvalidOperation |
| 37 | new | turnOn() | toggleOnMode() | pay() | | SILENT FREE | InvalidOperation |
| 38 | new | turnOn() | toggleOnMode() | endOngoingCommunication() | | SILENT FREE | InvalidOperation |
| 39 | new | turnOn() | toggleOnMode() | turnOn() | | SILENT FREE | InvalidOperation |
| 40 | new | turnOn() | makeVoiceCall() | pay() | | NORMAL BUSY | InvalidOperation |
| 41 | new | turnOn() | makeVoiceCall() | sendSMS() | | NORMAL BUSY | InvalidOperation |
| 42 | new | turnOn() | makeVoiceCall() | turnOn() | | NORMAL BUSY | InvalidOperation |
| 43 | new | turnOn() | makeVoiceCall() | balance() | | NORMAL BUSY | InvalidOperation |
| 44 | new | turnOn() | makeVoiceCall() | makeVoiceCall() | | NORMAL BUSY | InvalidOperation |
| 45 | new | turnOn() | makeVoiceCall() | acceptVoiceCall() | | NORMAL BUSY | InvalidOperation |
| 46 | new | turnOn() | makeVoiceCall() | turnOff() | | NORMAL BUSY | InvalidOperation |
| 47 | new | turnOn() | makeVoiceCall() | toggleOnMode() | | NORMAL BUSY | InvalidOperation |
| 48 | new | turnOn() | toggleOnMode() | makeVoiceCall() | pay() | SILENT BUSY | InvalidOperation |
| 49 | new | turnOn() | toggleOnMode() | makeVoiceCall() | sendSMS() | SILENT BUSY | InvalidOperation |
| 50 | new | turnOn() | toggleOnMode() | makeVoiceCall() | turnOn() | SILENT BUSY | InvalidOperation |
| 51 | new | turnOn() | toggleOnMode() | makeVoiceCall() | balance() | SILENT BUSY | InvalidOperation |
| 52 | new | turnOn() | toggleOnMode() | makeVoiceCall() | makeVoiceCall() | SILENT BUSY | InvalidOperation |
| 53 | new | turnOn() | toggleOnMode() | makeVoiceCall() | acceptVoiceCall() | SILENT BUSY | InvalidOperation |
| 54 | new | turnOn() | toggleOnMode() | makeVoiceCall() | turnOff() | SILENT BUSY | InvalidOperation |
| 55 | new | turnOn() | toggleOnMode() | makeVoiceCall() | toggleOnMode() | SILENT BUSY | InvalidOperation |