– Reveal Faults

White-box Testing

- **Example**

```
INPUT-FROM-USER(x);
If (x <= 300) {
        INPUT-FROM-FILE(BALANCE);
        If (x <= BALANCE)
                GiveMoney x;
        else Print “You don’t have $x in your account!!”}
else
        Print “You cannot withdraw more than $300”;
```

Determining Adequacy

- Statement coverage
- Branch coverage
- Path coverage
- All-def-use-path coverage

Boundary-value Analysis

- Partition the program domain into input classes
- Choose test data that lies both

Mutation Testing

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Category-partition Method

Steps

- **Examine each functional unit**
  - **Identify parameters**
    - **vindrtioronnte(14af) 7.Eltio) c0ndtutior crs**
      - Eput to thefnction-7.5(el un)-4.5(et)]TJ 14.04 0 0 14.04 175.1206 656.04 Tm0

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Steps

- **Develop “Formal Test Specification”**

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Example

- VCR command-line software
- Commands
  - Rewind
    - If at the end of tape
  - Play
    - If fully rewound
  - Eject
    - If at the end of tape
  - Load

Preconditions & Effects

- Rewind
  - Precondition: end_of_tape
  - Effects: ¬end_of_tape
- Play
  - Precondition: ¬end_of_tape
  - Effects: end_of_tape
- Eject
  - Precondition: end_of_tape
  - Effects: ¬has_tape
- Load
  - Precondition: ¬has_tape
  - Effects: has_tape

Initial and Goal States

- Initial State
  - end_of_tape
- Goal State
  - ¬end_of_tape
- Plan?
  - Rewind

Initial and Goal States

- Initial State
  - ¬end_of_tape & has_tape
- Goal State
  - ¬has_tape
- Plan?
  - Play
  - Eject

Others

- Random testing
- Statistical testing
- Interface based