CS132: Software Engineering
HW4: Testing

In this homework, we will practice how to generate test cases that cover system execution from different perspectives. There are 100pts in this homework, which will be scaled to 10pt.

1. Control Flow Testing (50pts)

For a binary search algorithm:

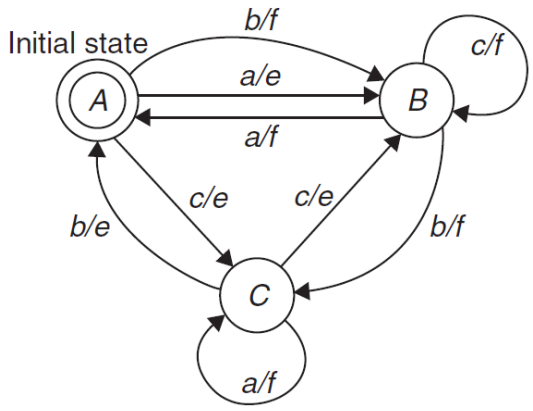
```
int binsearch(int X, int V[], int n){
   int low, high, mid;
   low = 0;
   high = n - 1;
   while (low <= high) {
      mid = (low + high)/2;
      if (X < V[mid])
           high = mid - 1;
      else if (X > V[mid])
           low = mid + 1;
      else
           return mid;
    }
    return -1;
}
```

a. Draw the Control Flow diagram for this function (10pts)
b. Identify a set of linearly independent paths from the control flow (20pts)
c. Identify complete test cases (input, output) corresponding to the linearly independent paths. (20pts)

Note: Complete branch coverage should be achieved by your test cases.

2. State Transition Coverage Testing (50pts)

For a State Machine shown below:



a. Draw the State Table for the state machine (15pts)
b. Identify 0-switch test cases for the state machine (35pts)

Note: The x/y on each transition refers to input/output of the transition. Also each test case should contain: start state, input, expected output, finish state and test coverage item.

Submission

The deadline of this homework is June 5th at 23:59. Please submit a .pdf file on Blackboard with name "CS132_HW4_YourName.pdf".