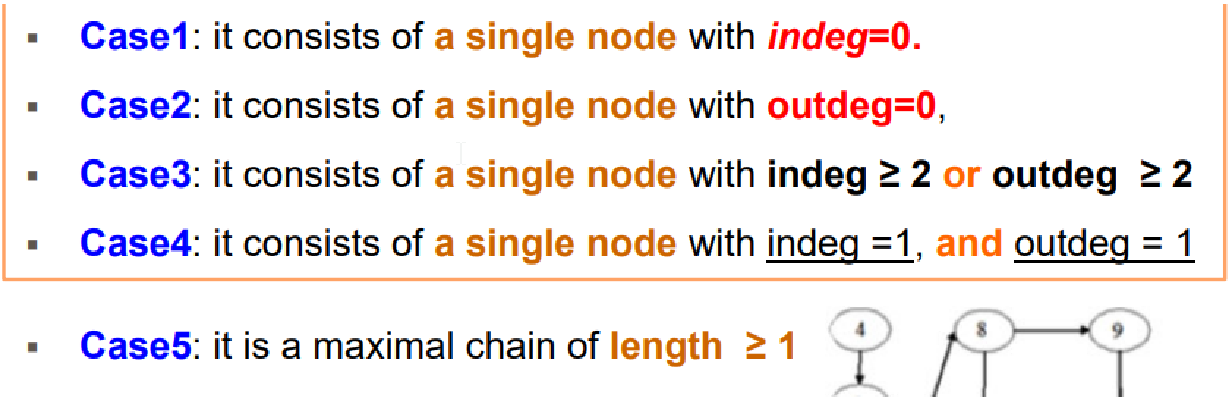
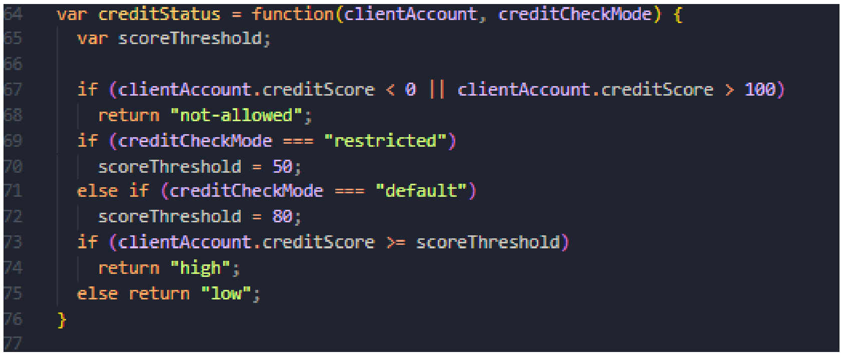
Question 1) make DD graph for the 2 function



- **Case1**: it consists of **a single node** with ***indeg*=0.**
- **Case2**: it consists of **a single node** with **outdeg=0**,
- **Case3**: it consists of **a single node** with **indeg ≥ 2 or outdeg ≥ 2**
- **Case4**: it consists of **a single node** with indeg =1, **and** outdeg = 1
- **Case5**: it is a maximal chain of **length ≥ 1**

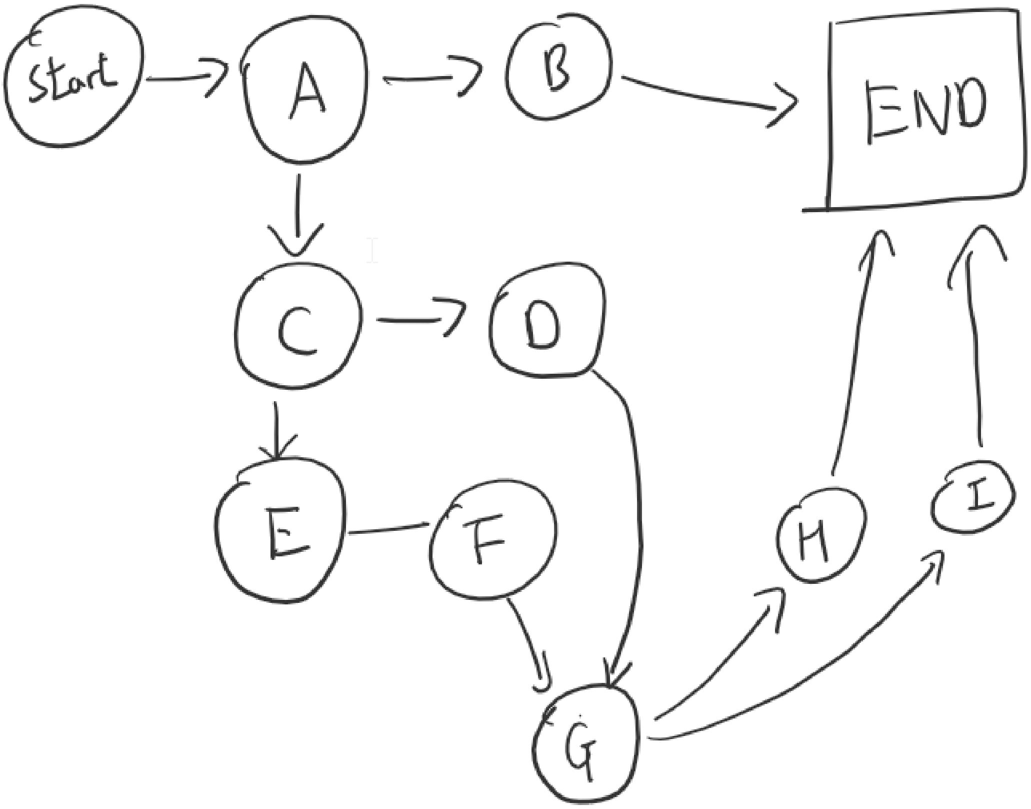
For CreditStatus:



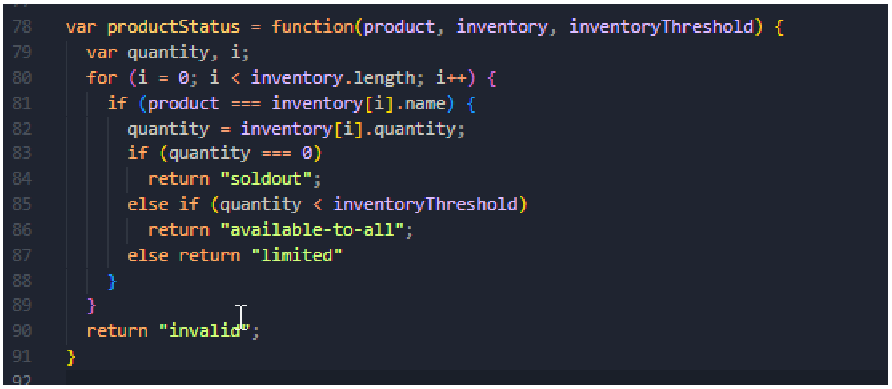
```
64  var creditStatus = function(clientAccount, creditCheckMode) {
65    var scoreThreshold;
66
67    if (clientAccount.creditScore < 0 || clientAccount.creditScore > 100)
68      return "not-allowed";
69    if (creditCheckMode === "restricted")
70      scoreThreshold = 50;
71    else if (creditCheckMode === "default")
72      scoreThreshold = 80;
73    if (clientAccount.creditScore >= scoreThreshold)
74      return "high";
75    else return "low";
76  }
77
```

Program Graph(Line number)	DD-Chain Name	Case #
65	Start	1
67	A	5
68	B	4
69	C	5
70	D	4
71	E	4
72	F	4
73	G	3
74	H	4
75	I	4
76	End	2

DD Graph



For product Status:

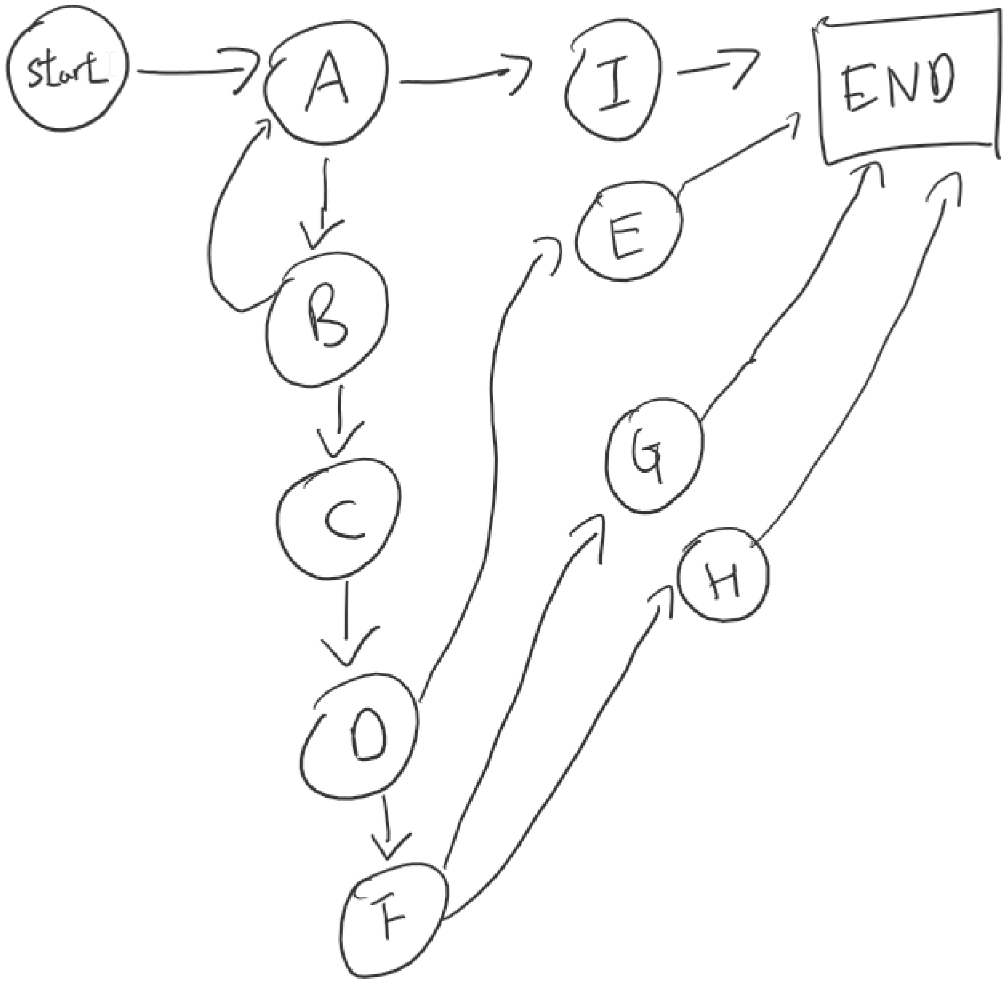


```
78  var productStatus = function(product, inventory, inventoryThreshold) {
79    var quantity, i;
80    for (i = 0; i < inventory.length; i++) {
81      if (product === inventory[i].name) {
82        quantity = inventory[i].quantity;
83        if (quantity === 0)
84          return "soldout";
85        else if (quantity < inventoryThreshold)
86          return "available-to-all";
87        else return "limited"
88      }
89    }
90    return "invalid";
91  }
```

Program Graph(Line number)	DD-Chain Name	Case #
79	Start	1
80	A	3
81	B	5
82	C	4
83	D	5
84	E	4

85	F	5
86	G	4
87	H	4
90	I	4
91	End	2

DD graph:



Q2

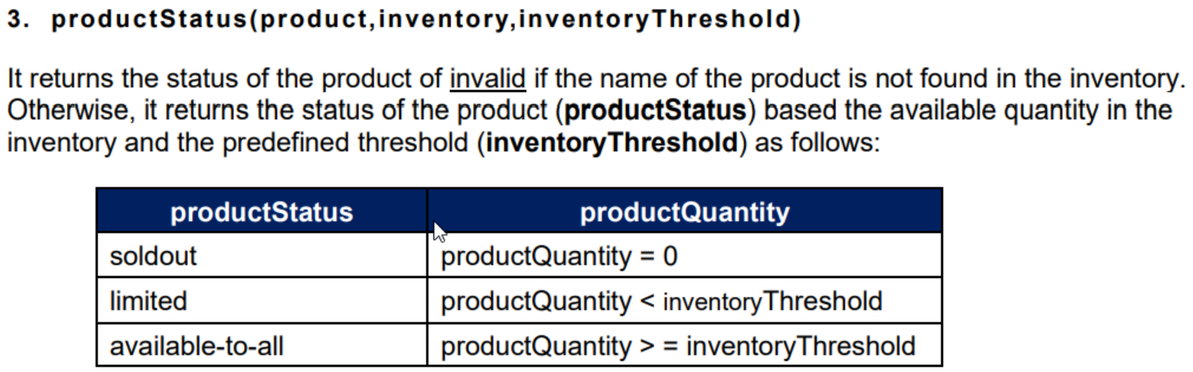
creditStatus: Statement/Edge coverage

Test Case	clientAccount	creditCheckMode	Expected	Test path
1	{creditScore:-1}	restricted	Not-allowed	Start, A,B,End

2	{creditScore:101}	restricted	Not-allowed	Start, A,B,End
3	{creditScore:40}	restricted	low	Start, A,C,D,G,I,End
4	{creditScore:50}	restricted	High	Start, A,C,D,G,H,End
5	{creditScore:50}	default	Low	Start, A,C,E,F,G,I,End
6	{creditScore:80}	default	high	Start, A,C,E,F,G,H,End
7	{creditScore:-1}	default	Not-allowed	Start, A,B,End
8	{creditScore:101}	default	Not-allowed	Start, A,B,End
9	{creditScore:50}	Something(Neither restricted/default)	low	Start,A,C,E,G,I,End

productStatus:Statement/Edge coverage

(Note that: the code is wrong on F meaning the limited/available are flipped. For this DD coverage, we are assuming that F is correct meaning G and H will not be correct)



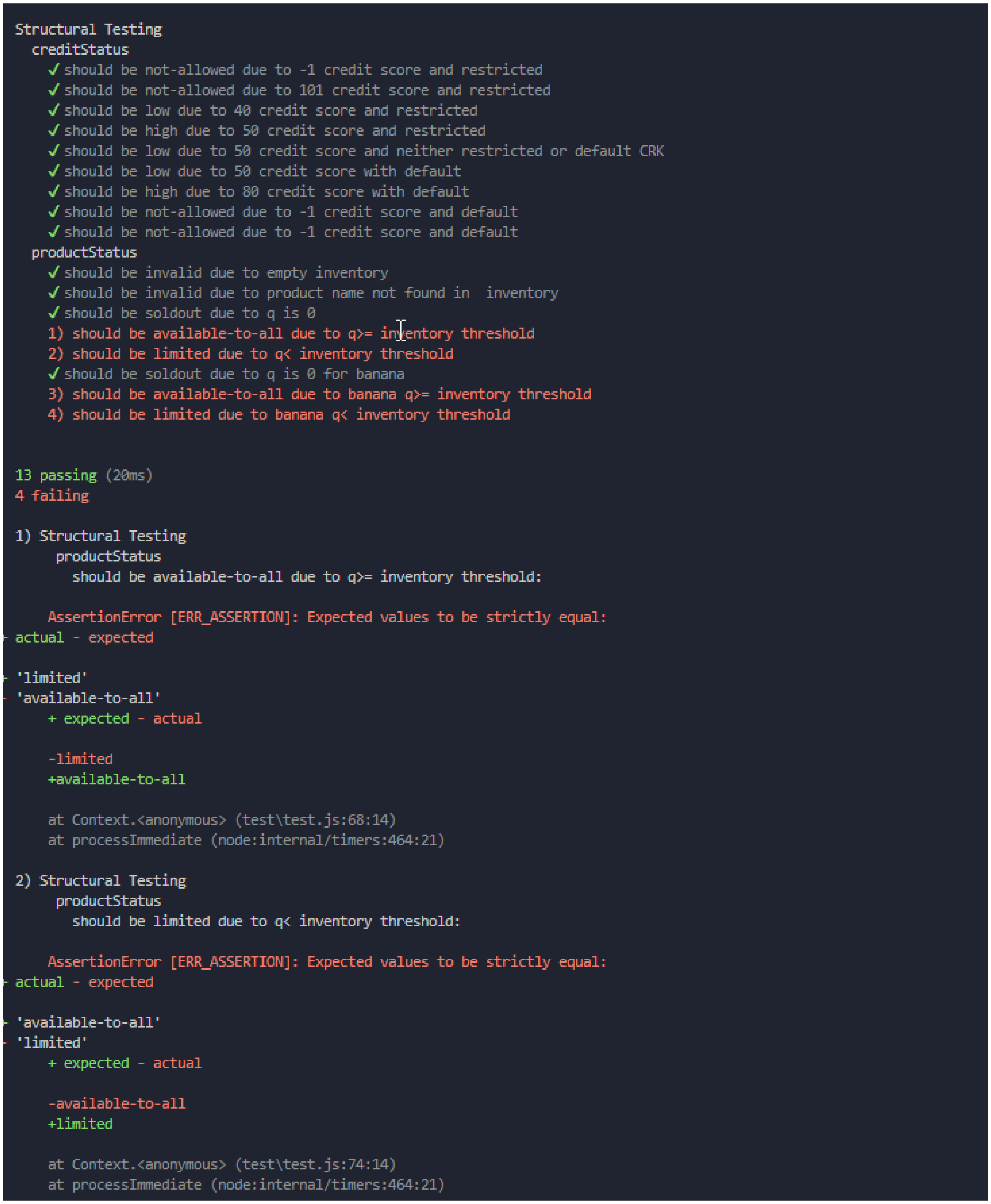
3. productStatus(product,inventory,inventoryThreshold)

It returns the status of the product of invalid if the name of the product is not found in the inventory. Otherwise, it returns the status of the product (**productStatus**) based the available quantity in the inventory and the predefined threshold (**inventoryThreshold**) as follows:

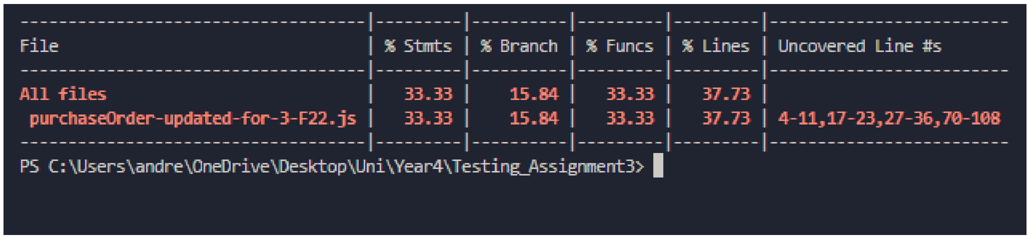
productStatus	productQuantity
soldout	productQuantity = 0
limited	productQuantity < inventoryThreshold
available-to-all	productQuantity > = inventoryThreshold

Test Case	product	inventory	Inventory Threshold	Expected	Test path
9	Apple	[]	100	Invalid	Start, A,I,End
10	Apple	[{‘name’: ‘banana’, ‘q’:50}]	100	Invalid	Start, A,B,A,I,End
11	Apple	[{‘name’: ‘apple, ‘q’:0}]	100	Soldout	Start, A,B,C,D,E,End
12	Apple	[{‘name’: ‘apple, ‘q’:500}]	100	Available-to-all	Start, A,B,C,D,F,H,End
13	Apple	[{‘name’: ‘apple, ‘q’:100}]	150	Limited	Start, A,B,C,D,F,G,End
14	Banana	[{‘name’: ‘apple, ‘q’:100},{‘name’: ‘banana’, ‘q’:0}]	100	Soldout	Start, A,B,A,B,C,D,E,End
15	Banana	[{‘name’: ‘apple, ‘q’:100},{‘name’:	200	Available-to-all	Start, A,B,A,B,C,D,F,H,End

		‘banana’, ‘q’:500}]			
16	Banana	[{‘name’: ‘apple, ‘q’:500},{‘name’: ‘banana’, ‘q’:100}]	150	Limited	Start, A,B,A,B,C,D,G,H,End

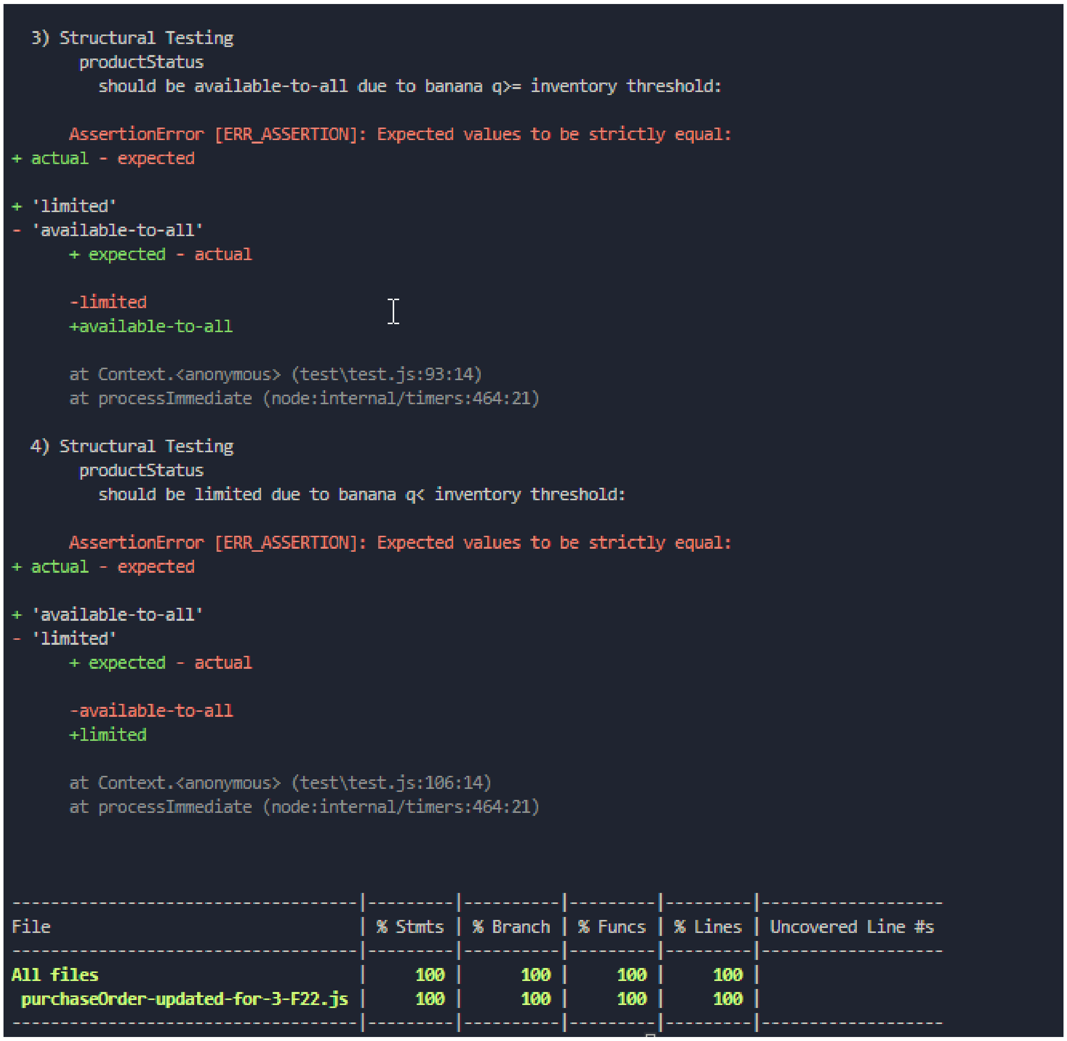


```
Structural Testing
  creditStatus
    ✓ should be not-allowed due to -1 credit score and restricted
    ✓ should be not-allowed due to 101 credit score and restricted
    ✓ should be low due to 40 credit score and restricted
    ✓ should be high due to 50 credit score and restricted
    ✓ should be low due to 50 credit score and neither restricted or default CRK
    ✓ should be low due to 50 credit score with default
    ✓ should be high due to 80 credit score with default
    ✓ should be not-allowed due to -1 credit score and default
    ✓ should be not-allowed due to -1 credit score and default
  productStatus
    ✓ should be invalid due to empty inventory
    ✓ should be invalid due to product name not found in  inventory
    ✓ should be soldout due to q is 0
    1) should be available-to-all due to q>= inventory threshold
    2) should be limited due to q< inventory threshold
    ✓ should be soldout due to q is 0 for banana
    3) should be available-to-all due to banana q>= inventory threshold
    4) should be limited due to banana q< inventory threshold


13 passing (20ms)
4 failing

1) Structural Testing
     productStatus
       should be available-to-all due to q>= inventory threshold:

    AssertionError [ERR_ASSERTION]: Expected values to be strictly equal:
+ actual - expected

+ 'limited'
- 'available-to-all'
    + expected - actual

    -limited
    +available-to-all

    at Context.<anonymous> (test\test.js:68:14)
    at processImmediate (node:internal/timers:464:21)

2) Structural Testing
     productStatus
       should be limited due to q< inventory threshold:

    AssertionError [ERR_ASSERTION]: Expected values to be strictly equal:
+ actual - expected

+ 'available-to-all'
- 'limited'
    + expected - actual

    -available-to-all
    +limited

    at Context.<anonymous> (test\test.js:74:14)
    at processImmediate (node:internal/timers:464:21)
```



```
------------------------------------|---------|----------|---------|---------|-------------------------
File                                | % Stmts | % Branch | % Funcs | % Lines | Uncovered Line #s
------------------------------------|---------|----------|---------|---------|-------------------------
All files                           |   33.33 |    15.84 |   33.33 |   37.73 |
 purchaseOrder-updated-for-3-F22.js |   33.33 |    15.84 |   33.33 |   37.73 | 4-11,17-23,27-36,70-108
------------------------------------|---------|----------|---------|---------|-------------------------
PS C:\Users\andre\OneDrive\Desktop\Uni\Year4\Testing_Assignment3>
```

The results were disappointing but after commenting out the functions not require for testing, the stats is a lot better.



```
  3) Structural Testing
       productStatus
         should be available-to-all due to banana q>= inventory threshold:

      AssertionError [ERR_ASSERTION]: Expected values to be strictly equal:
+ actual - expected

+ 'limited'
- 'available-to-all'
      + expected - actual

      -limited
      +available-to-all

      at Context.<anonymous> (test\test.js:93:14)
      at processImmediate (node:internal/timers:464:21)

  4) Structural Testing
       productStatus
         should be limited due to banana q< inventory threshold:

      AssertionError [ERR_ASSERTION]: Expected values to be strictly equal:
+ actual - expected

+ 'available-to-all'
- 'limited'
      + expected - actual

      -available-to-all
      +limited

      at Context.<anonymous> (test\test.js:106:14)
      at processImmediate (node:internal/timers:464:21)



------------------------------------|---------|----------|---------|---------|-------------------
File                                | % Stmts | % Branch | % Funcs | % Lines | Uncovered Line #s
------------------------------------|---------|----------|---------|---------|-------------------
All files                           |     100 |      100 |     100 |     100 |
 purchaseOrder-updated-for-3-F22.js |     100 |      100 |     100 |     100 |
------------------------------------|---------|----------|---------|---------|-------------------
```