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Testing Problems

1.)White Box Testing

Basic Path Testing

Cyclomatic Complexity

Case : Login Component

Username- A-Z , a-z (6 characters)

Password- in between 1-100 numbers

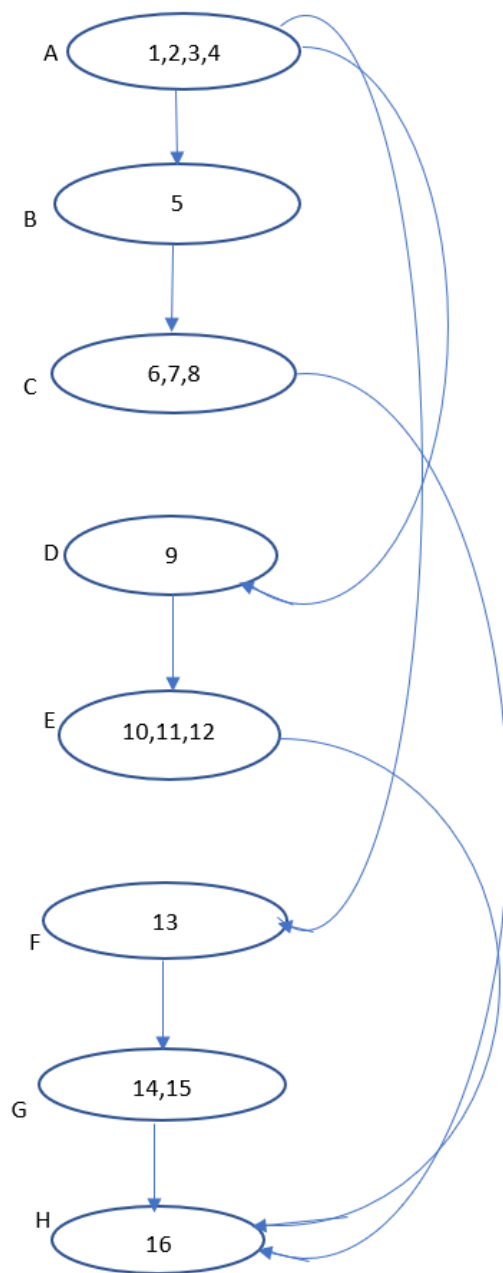
Consider the following program:-

```
main()
{
    int password;
    str username;
    printf("Enter the username");
    scanf("%s", &username);
    printf("Enter the password");
    scanf("%d", &password);

    if(password=="A" || password=="Z")
    {
        printf("Invalid password, please enter again");
    }
    else if (password <= 100)
    {
        printf("Valid password");
    }
    else{
        printf("Try again");
    }
}
```

```
}  
} //end main
```

a.) Draw the DD graph for the above problem:



b) Cyclomatic Complexity :

(i) $V(G) = e - n + 2$

Where; e = no. of edges , n = no. of nodes

$e=9$, $n=8$

$V(G) = 9 - 8 + 2 = 1 + 2$

$V(G) = 3$

(ii) cyclomatic no. of programs

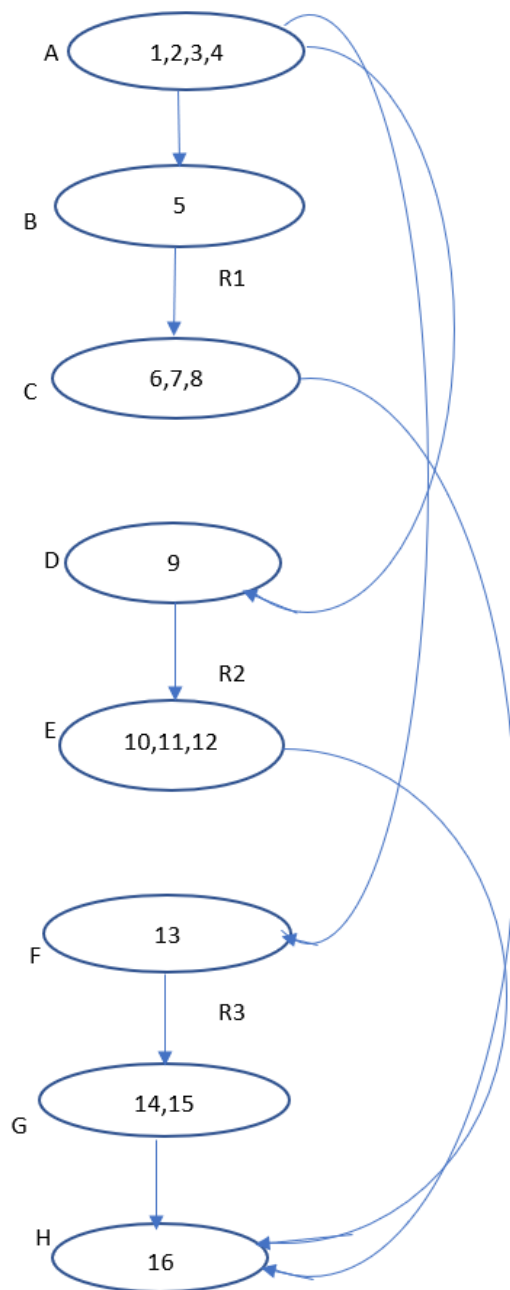
$V(G) = d + 1$

Where; d = decision nodes

$d = k - 1 = 9 - 1 = 8$

$V(G) = d + 1 = 8 + 1$

$V(G) = 9$



(iii) No. of Regions

$V(G) = \text{no. of regions}$

$V(G) = 3 (R1, R2, R3)$

c) Independent Paths :

Since the cyclomatic complexity of the graph is 3 , there will be 3 independent paths in the graphs as shown below -:

A-B-C-H

A-D-E-H

A-P-G-H

d)Test designs using the independent paths :

Test Case ID	Input Values	Expected Result	Independent paths covered by Test cases
1	A	Invalid password , please enter again	A-B-C-H
2	143	Valid password	A-D-E-H
3	019283746542	Try again	A-P-G-H

2.)Black box testing

BVC (Boundary Value Analysis)

Case : Personal Details

Name – A-Z , a-z , (1-10 chars)

Contact No – 10 digits

Location – A-Z , a-z , 1-100 (1-15 chars)

Since there are three variables Name , Contact No , Location , the total number of test cases will be $4n+1=13$.

The set of boundary values is shown below :

	Name (1-10)	Contact No(10)	Location (1-15)
Min value	1	10	1
Max value	10	10	15
Min+ value	2	10	2
Max- value	9	10	14
Nom value	4-8	10	8-12

Using the values , test cases can be designed as shown below :

Test Case ID	Name	Contact No	Location	Expected Output
1	A	7888976453	2-KarveNagar	Name – A Contact No – 7888976453 Location – 2-KarveNagar
2	Bk	2365	D-34 kothrud	INVALID CONTACT NO.
3	Abhilasha	2536479876	R-20 camp	Name – Abhilasha Contact No – 2536479876 Location – R-20 camp
4	Abhinav_Dy	1234567890	S-26 sbroad	Name – Abhinav_Dy Contact No – 1234567890 Location – S-26 sbroad
5	Abhay	0987654321	g61 fcroad	Name – Abhay Contact No – 0987654321 Location – g61 fcroad
6	Anju	1234321567	U-73 NIBM	Name – Anju Contact No –1234321567 Location – U-73 NIBM
7	Anjali	5678654532	C-1 Rsparade	Name – Anjali Contact No –5678654532 Location – C-1 Rsparade
8	Ankur	5678903214	Awas	INVALID LOCATION
9	Nimish	3456789210	L	Name – Nimish Contact No –3456789210 Location – L
10	R	3456789032	R2	INVALID NAME
11	Rohit	1234876549	Bavdhan 64east	Name – Rohit Contact No –1234876549 Location – Bavdhan 64east
12	Watsin	8765432178	Sect2 VimanNgar	Name – Watsin Contact No – 8765432178 Location – Sect2 VimanNgar
13	Smith	2345438906	Star Mrket	Name – Smith Contact No – 2345438906 Location – Star Mrket

3.)Black box testing

Decision Table testing

Case : Booking System

Location is more than 10 km away from the centre ,Time taken will be more

Location is less than 10 km away from the centre ,Time taken will be less , than free coupons for shopping

If booking for No. of Months is more than 3 & less than 5 than free coupons for shopping

If booking for No. of Months is more than 6 than the customer will get premium membership and free coupons for shopping

The decision table for the program is shown below :

ENTRY

		Rule 1	Rule 2	Rule 3
Condition Stub	C1 : Location > 10 km & time taken is more	T	F	O
	C2 : Location < 10 km & time taken is less	F	T	O
	C3 : No of months >3 & <5	O	O	T
	C4 : No of Months > 6	O	T	F
Action Stub	A1 : Free coupons for Shopping		X	X
	A2 : Premium Membership		X	

The test cases derived from the decision table are given below :

Test case ID	Location (in kms)	Time taken	No of months	Expected Result
1	11 kms	more	1	Invalid No of Months
2	6 kms	less	4	Free coupons for shopping
3	8 kms	less	12	Free coupons for shopping & Premium Membership
4	12 kms	less	nil	Invalid Time Taken
5	nil	less	2	Invalid Location

