Assignment 4

M Ahsan Jamshaid BSE173086
Jerrold Sigamony BSE173054
Usama Yasin BSE173078

Code:

```
public String ConvocationManagement(int credithours,float gpa,int semester)
{
        String var="Null";
        if(gpa<2 && semester>13 || semester>13 && credithours<152)
                {
                  var= "not applicable";
                }
         else if(gpa>=2 && gpa<=4 && semester>=8 && semester<=14 && credithours>152)
                {
                  var= "Qualified";
                }
            else if(semester<8 || gpa<2 || credithours<152)
                {
                      var= "disqualified";
                }
          return var;
}
```

Code Description:

There are three categories in which students lie; Qualified, Disqualified, and Not Applicable. Students lie in these categories concerning their departments criteria. There are three departments; Computer Science (CS), Mechanical Engineering (ME), Electrical Engineering (EE). For CS the criteria are set that student must be having CGPA of greater than 2.0, minimum credit hours should be equal to 152 and maximum semesters equals to 14. For ME the criteria are set that student must be having CGPA of greater than 2.0, minimum credit hours should be equal to 156 and a maximum semester spent equals 14. For EE the criteria are set that student must be having CGPA of greater than 2.0, minimum credit hours should be equal to 160 and a maximum semester spent equals 14.

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Statement no 1:

(gpa<2 && semester>13 || semester>13 && credithours<152)

gpa	semester	credithours	output
T	T	T	T
T	T	F	T
T	F	T	F
T	F	F	F
F	T	T	T
F	T	F	F
F	F	T	F
F	F	F	F

With input values:

gpa	semester	credithours	output
1	14	120	not applicable
0	15	152	not applicable
1.5	2	151	disqualified
1.3	3	153	disqualified
2	16	150	not applicable
3	15	155	disqualified
4	5	140	disqualified
2.5	4	160	Qualified

Statement no 2:

(gpa>=2 && gpa<=4 && semester>=8 && semester<=14 && credithours>152

gpa	semester	credithours	output
T	T	T	T
T	T	F	F
T	F	T	F
T	F	F	F
F	T	T	F
F	T	F	F
F	F	T	F
F	F	F	F

With input values:

gpa	semester	credithours	output
2	8	153	T
3	9	130	F
4	1	155	F
2.5	2	120	F
0	10	156	F
1	11	152	F
0.5	15	157	F
1.5	5	123	F

Statement no 3:

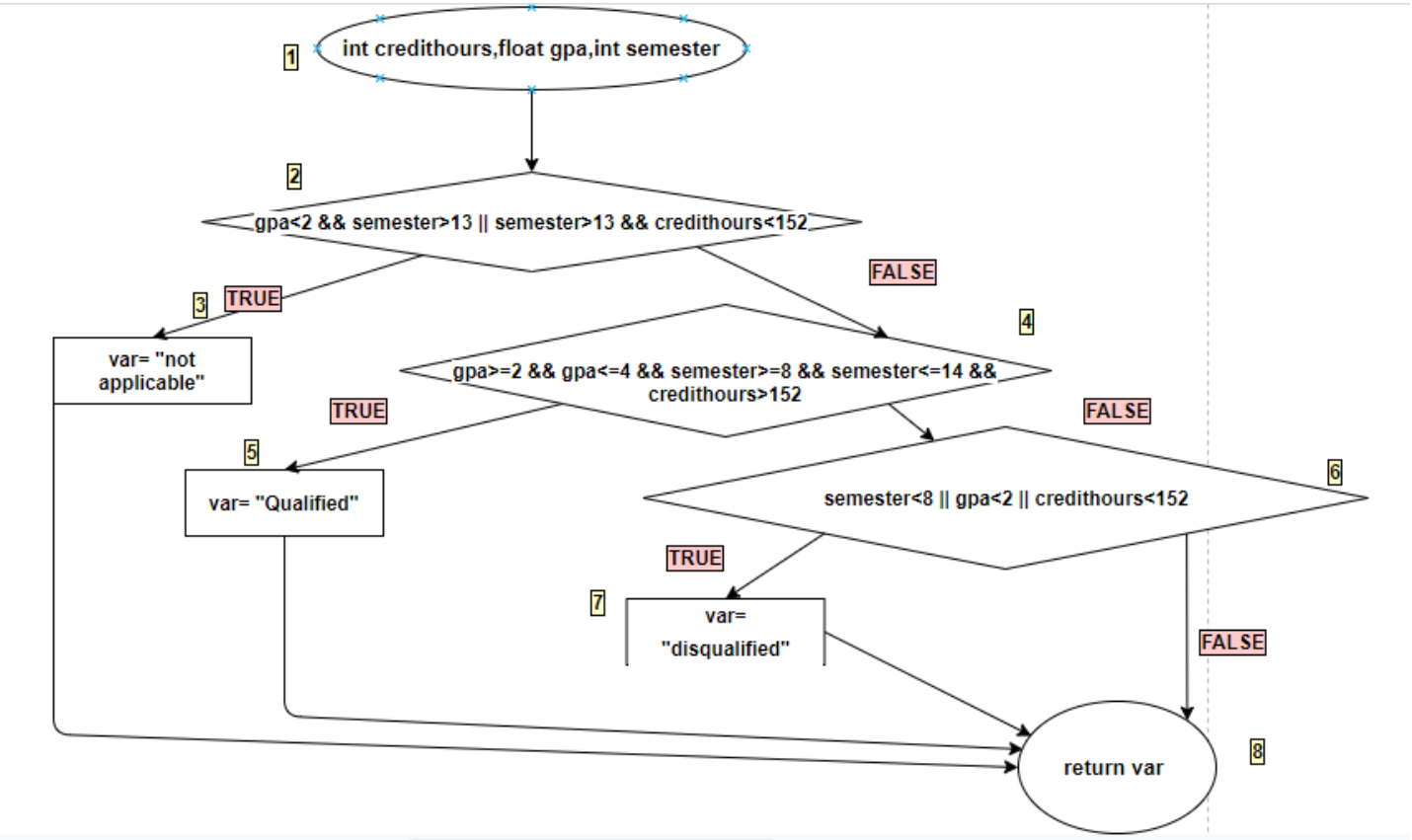
(semester<8 || gpa<2 || credithours<152)

gpa	semester	credithours	output
T	T	T	T
T	T	F	F
T	F	T	F
T	F	F	F
F	T	T	F
F	T	F	F
F	F	T	F
F	F	F	F

With input values:

gpa	semester	credithours	output
2	8	153	T
3	9	130	F
4	1	155	F
2.5	2	120	F
0	10	156	F
1	11	152	F
0.5	15	157	F
1.5	5	123	F

Control Flow Graph :



Path Predicate Expressions:

Number	Path	Path Predicate Expression
1	1 -> 2 -> 3 ->8	gpa<2 && semester>13 || semester>13&& credithours<152
2	1 -> 2 -> 4 -> 5 -> 8	gpa<2 && semester>13 || semester>13&& credithours<152, gpa>=2 && gpa<=4 && semester>=8 && semester<=14 && credithours>152
3	1 -> 2 -> 4 -> 6 -> 7 -> 8	gpa<2 && semester>13 || semester>13&& credithours<152, gpa>=2 && gpa<=4 && semester>=8 && semester<=14 && credithours>152, semester<8 || gpa<2 || credithours<152
4	1 -> 2 -> 4 -> 6 -> 8	gpa<2 && semester>13 || semester>13&& credithours<152, gpa>=2 && gpa<=4 && semester>=8 && semester<=14 && credithours>152, semester<8 || gpa<2 || credithours<152

Test Oracle:

No	Input			Path	Actual Output	Expected Output
	gpa	semester	credithours			
1	1	14	153	1 -> 2 -> 3 ->8	not applicable	not applicable
2	3	8	150	1 -> 2 -> 4 -> 5 -> 8	Qualified	Qualified
3	1	1	140	1 -> 2 -> 4 -> 6 -> 7 -> 8	disqualified	disqualified
4	0	0	0	1 -> 2 -> 4 -> 6 -> 8	disqualified	disqualified