

SE 4367, Software Testing

Homework #12, Control Flow Coverage

For the following program P written in pseudo-code, given the test set T:

$T = \{t_1 = \langle 4, 2 \rangle, t_2 = \langle 9, 1 \rangle, t_3 = \langle 6, 1 \rangle\}$

- 1) What is the domain for statement coverage of P? Do not include syntactical markers.
- 2) What is the statement coverage for T?
- 3) What is the domain for block coverage of P?
- 4) What is the block coverage for T?
- 5) What is the domain for decision coverage of P?
- 6) What is the decision coverage for T?
- 7) What is the domain for condition coverage of P?
- 8) What is the condition coverage for T?

Program P

```
1)  integer X, Y, Z;
2)  input (X, Y);
3)  if (X<0 or X>8 or Y<1 or Y>3)
4)  {
5)      output ("Boundary condition failure.");
6)  } // end if invalid inputs
7)  else
8)  {
9)      Z = 0;
10)     if (X < 5)
11)     {
12)         Z = X + Y;
13)         if (Y == 1)
14)         {
15)             Z = X ^ 2;
16)         } // end if (Y==1)
17)     } // end if (X<5)
18)  else
19)  {
20)      Z = Z - X;
21)      if (Y == 0)
22)      {
23)          Z = Z * Z;
24)      } // end if (Y==2)
25)  else
26)  {
27)      Z = Z + X;
28)  } // end else !(Y==2)
29)  Z = Z + 1;
30)  } // end else !(X<5)
31)  output (X,Y,Z);
32)  } // end else legal inputs
33)  output ("Program ends.");
34)  end;
```

Grading Rubric

Each part is worth 12 points

Each coverage part

- 6 points for numerator and 6 for denominator if in ratio form (preferred)
- missing the infeasible element is worth 6 points on each coverage problem (denominator wrong)

Answers can be either ratios (fractions), decimal numbers $[0,1]$, or percentages for coverage

- if expressed as a decimal, two places is sufficient
- if expressed as a percentage, to the nearest percent is sufficient