Software Quality Assurance and Testing Technology

2nd Semester, Spring 2022

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```
scanf("%d %d",&x, &y)
if (y < 0)
    pow = -y;
else
    pow = y;
z = 1.0;
while (pow != 0) {
    z = z * x;
    pow = pow - 1;
    }
if (y < 0)
    z = 1.0 / z;
printf ("%f",z);
```

1. Please draw the control flow graph of the following code and provide the cyclomatic complexity V(G) of the control flow graph;
2. Please provide the Basis Path set of the control flow graph;
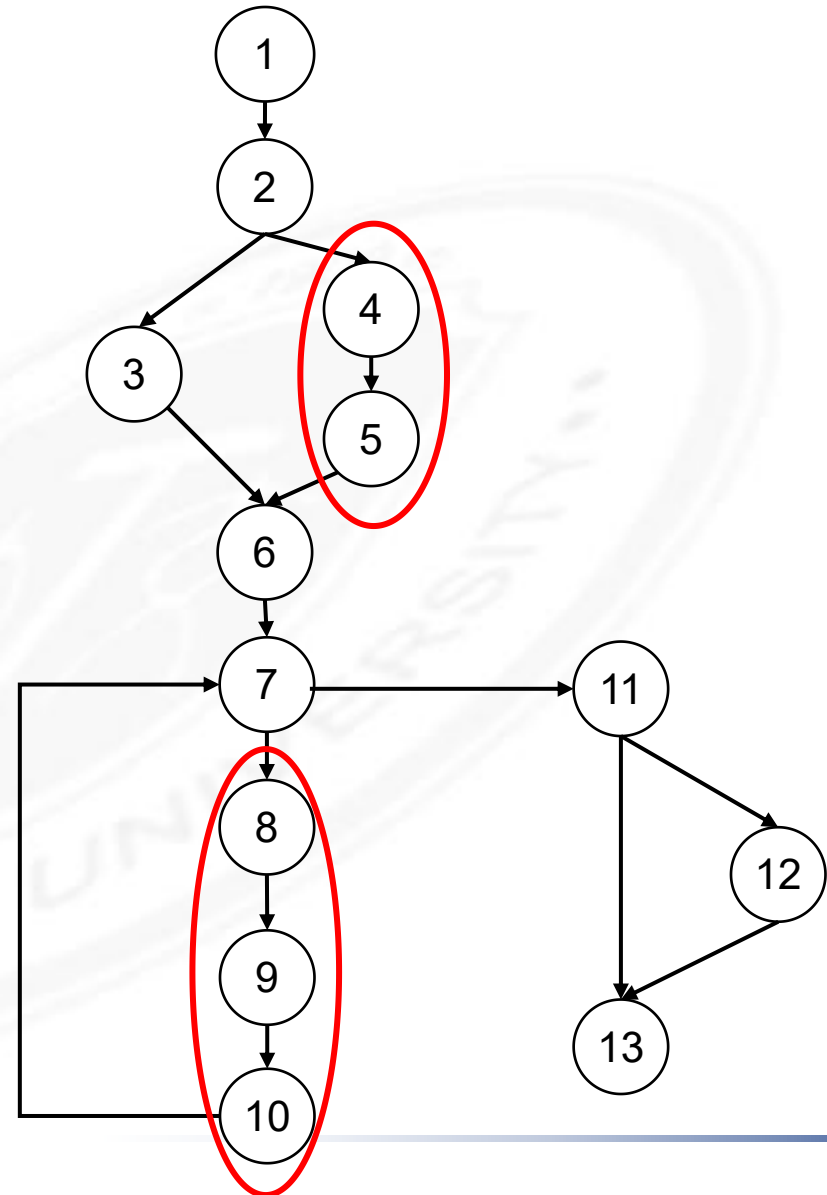
【腾讯文档】Basis path test example 1
https://docs.qq.com/form/page/DSFdHVIlleEZnQnVa
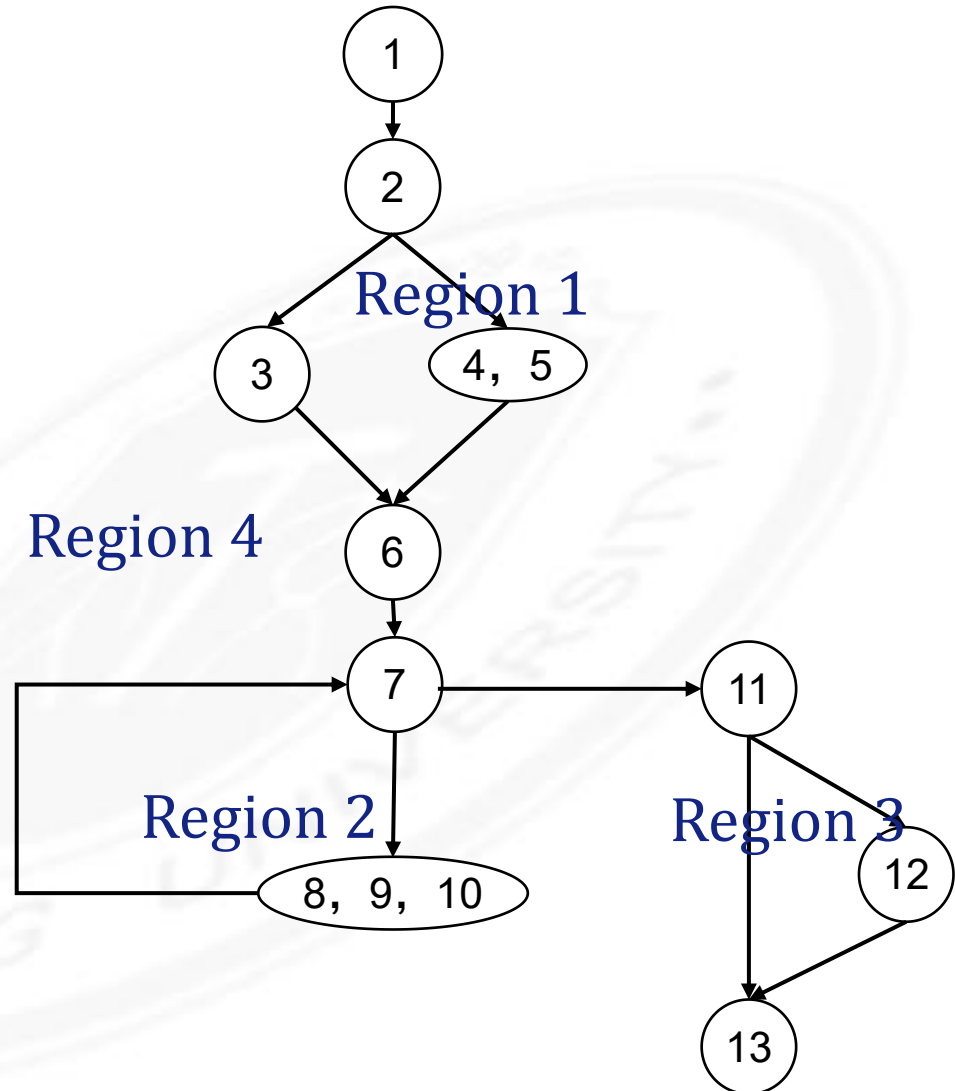
1. scanf("%d %d",&x, &y)
2. if (y < 0)
3.   pow = -y;
4. else
5.   pow = y;
6. z = 1.0;
7. while (pow != 0) {
8.   z = z * x;
9.   pow = pow - 1;
10.   }
11. if (y < 0)
12.   z = 1.0 / z;
13. printf ("%f",z);

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2   **if (y < 0)**
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Region 1

Region 4

Region 2

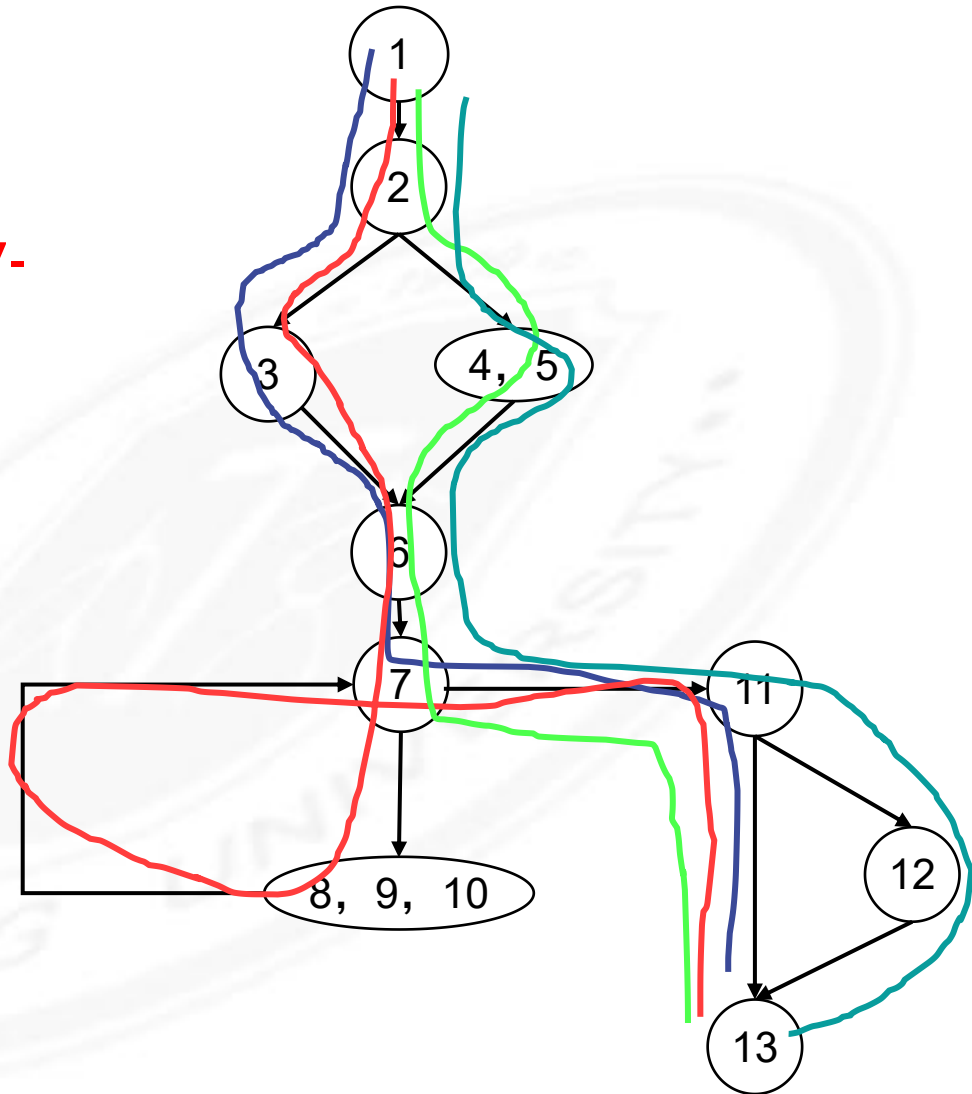Region 3

Path1: 1-2-3-6-7-11-13

Path2: 1-2-3-6-7-8-9-10-7-11-13

Path3: 1-2-4-5-6-7-11-13

Path4: 1-2-4-5-6-7-11-12-13

- you do not need an activity diagram, but the picture will help when you trace component paths

- count each logical test—compound tests count as the number of Boolean operators + 1 (i.e., count each simple predicate)

- basis path testing should be applied to all components, if possible, and to critical components **always**

➡️*Basis path testing does not test all possible combinations of all paths through the code; it just tests every path at least once.*

```
1    for (j=1; j<N; j++)
2    {
3      last = N - j + 1;
4      for (k=1; k<last; k++)
5       {
6        if (list[k] > list[k+1])
7          {
8           temp = list[k];
9           list[k] = list[k+1];
10          list[k+1] = temp;
11          }
12        }
13      }
14  print("Done\n");
```

1. Please draw the control flow graph of the following code and provide the cyclomatic complexity V(G) of the control flow graph;
2. Please provide the Basis Path set of the control flow graph;

【腾讯文档】Basis path test example 2
https://docs.qq.com/form/page/DSEF5cXRY
eUdnTlhY

```
/* COUNT
This program counts the number of characters and lines in a text file.
   INPUT: Text File
   OUTPUT: Number of characters and number of lines.
*/
1        main(int argc, char *argv[])
2        {
3        int numChars = 0;
4        int numLines = 0;
5        char chr;
6        FILE *fp = NULL;
7
8        if (argc < 2)
9           {
10          printf("\nUsage: %s <filename>", argv[0]);
11          return (-1);
12          }
13       fp = fopen(argv[1], "r");
14       if (fp == NULL)
15         {
16         perror(argv[1]);      /* display error message */
17         return (-2);
18         }
19        while (!feof(fp))
20          {
21          chr = getc(fp);        /* read character */
22          if (chr == '\n')      /* if carriage return */
23              ++numLines;
24          else
25              ++numChars;
26          }
27       printf("\nNumber of characters = %d", numChars);
28       printf("\nNumber of lines = %d", numLines);
29       }
```

1. Please draw the control flow graph of the following code and provide the cyclomatic complexity V(G) of the control flow graph;
2. Please provide the Basis Path set of the control flow graph;

【腾讯文档】Basis path test example 3
https://docs.qq.com/form/page/DSGVGSm pkSU1MR25k

```
1.   public class TestBreakContinue {
2.       public static void main(String[] args) {
3.           int total = 0;
4.           System.out.println("Begin");
5.           while (true) {
6.               total++;
7.               int i = (int) Math.round(100 * Math.random());
8.               if (i == 88) {
9.                   break;
10.              }
11.          }
12.          int count = 0;
13.          outer: for (int i = 101; i < 150; i++) {
14.              for (int j = 2; j < i / 2; j++) {
15.                  if (i % j == 0)
16.                      continue outer;
17.              }
18.              System.out.print(i + "    ");
19.          }
20.      }
21. }
```

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【腾讯文档】Basis path test example 4
https://docs.qq.com/form/page/DSFJ0Zmp0cXBxaXRO

To be continued…
See you next week