Program Slicing

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What statements effect the value of ___ at line ____? (line numbers for discussion only.)

1. c = 4;
2. b = c;
3. a = b + c;
4. d = a + c;
5. f = d + b;
6. a = d + 8;
7. b = f + 30;
8. a = b + c:

How about this one?

```
1.  a = ….;
2.  b = …;
3. if (a <= b)
4.          x = a + b;
5. else
6.          y = a – b ;
7.  ….
```

And this one?

```
1.          while(…) {
2.              e = d;
3.              d = c;
4.              c = b ;
5.              b = a;
6.          }
```

And?

```
1.          c = 0;
2.          while (true) {
3.                  c = 1;
4.          }
5.          c = 2;
```

Minimal???

```
input x;
if (x) {
        // nothing involving x here..

         x = 1;
 }
else x = 2;
```

What about “a”?

```
1.  a = 5;
2.  while (p(k)) {
3.     if (q(c)) then {
4.                        b = a;
5.                        x = 1;
6.              } else { c = b;
7.                           y = 2; }
8.              k = k + 1;
9.  }
10. z = x + y;
```

“The Classic”

```
1.  #define YES 1
2.  #define NO 0
3.  #include <stdio.h>
4.  main() {
5.          int c, nl, nw, nc, inword;
6.          inword = NO;
7.          nl = 0;
8.          nw = 0;
9.          nc = 0;
10.         c = getchar();
11.         while ( c != EOF ) {
12.             nc = nc + 1;
13.             if ( c == '\n') nl = nl + 1;
14.             if ( c == ' ' || c == '\n' || c == '\t')
15.                     inword = NO;
16.             else if ( inword == NO )
17.                 { inword = YES;
18.                   nw = nw + 1; }
19.              c = getchar();
20.         }
21.         printf("%d \n", nl);
22.         printf("%d \n", nw);
23.         printf("%d \n", nc);
24.}
```

Sub-Classic 1

```
1.#include <stdio.h>
2.main() {
3.          int c, nl, nw, nc, inword; /* !! ?? */
4.          nc = 0;
5.          c = getchar();
6.          while ( c != EOF ) {
7.                    nc = nc + 1;
8.                    c = getchar();
9.             }
10.         printf("%d \n", nc);
11.     }
```

Sub-Classic 2

```
1. #include <stdio.h>
2.   main() {
3.         int c, nl, nw, nc, inword;
4.         nl = 0;
5.         c = getchar();
6.         while ( c != EOF ) {
7.             if ( c == '\n') nl = nl + 1;
8.           c = getchar();
9.          }
10.         printf("%d \n", nl);
11.    }
```

Sub-Classic 3

```
1.#include <stdio.h>
2.#define YES 1
3.#define NO 0
4.main() {
5.          int c, nl, nw, nc, inword;
6.          inword = NO;
7.          nw = 0;
8.          c = getchar();
9.          while ( c != EOF ) {
10.           if ( c == ' ' || c == '\n' || c == '\t')
11.                        inword = NO;
12.                else if ( inword == NO )
13.                      { inword = YES;
14.                        nw = nw + 1; }
15.                c = getchar();
16.           }
17.          printf("%d \n", nw);
18.    }
```

Sub-Classic 4

```
1. #include <stdio.h>
2. #define YES 1
3. #define NO 0
4. main() {
5.         int c, nl, nw, nc, inword;
6.         inword = NO;
7.         c = getchar();
8.         while ( c != EOF ) {
9.                 if ( c == ' ' || c == '\n' || c == '\t')
10.                         inword = NO;
11.                 else if ( inword == NO )
12.                         { inword = YES;
13.                          }
14.                 c = getchar();
15.           }
16.     }
```

```
1.  #include <stdio.h>
2.  #define YES 1
3.  #define NO 0
4.  main() {
5.      int c, nl, nw, nc, inword;
6.      c = getchar();
7.      while ( c != EOF ) {
8.          c = getchar();
9.       }
10.  }
```

Files and Functions

```
int rufus,toby;
main ( )  {
  int polar,watergate;
  polar = 1;
  rufus = 2;
  toby = 3;
  watergate = 4;
  ride (toby );
}
print (int critter) {
   printf ("%d",critter );
}
```

```
extern int rufus, toby ;
ride  (int horse) {
  int mule,donkey;

  mule = horse;
  print (rufus );
  donkey = toby + horse;
  print (horse );
  horse++;
  rufus = donkey;
  toby = mule;
}
```

reference variables…

```
1.  int cond();  //  something that returns T   F
2.  main  (  ) {
3.      int w, x, y, z;
4.      int *e, *f, *g, *h, *i, *j ;
5.      int **b, **c, **d;
6.      int ***a;
7.       a = cond ( ) ?  (cond ( ) ? &b : &c ) : &d;
8.       b = cond ( ) ? &e : &f;
9.       c = cond ( ) ? &g : &h;
10.      d = cond ( ) ? &i : &j;
11.      e = cond ( ) ? &i : &j;
12.      f = &x;
13.      g = &y;
14.      h = &z;
15.      i = &w;
16.      j = cond ( ) ? &w : &z;
17.      /* now assign to w, x, y or z */
18.   }
```