Assignment on the Promising Semantics (PS)

For each program below, tell whether the behavior in question is allowed in the promising semantics. If yes, point out the execution that produces the behavior. Otherwise, just say no. (Assume that all the accesses to shared variables are relaxed accesses.)

(a)

```
Initially, x = 0.

r1 = x; || r2 = x;
x = 1;  || x = 2;
```

Behavior in question: `r1 = 2, r2 = 1`.

(b)

```
Initially, x = y = 0.

x = 1; || r1 = x; || r3 = y;
y = 1; || r2 = y; || r4 = x;
```

Behavior in question: `r1 = 1, r2 = 0, r3 = 1, r4 = 0`.

(c)

```
Initially, x = y = 0.

r1 = x;                  || r3 = y;
r2 = 1 + r1 * r1 - r1;   || x = r3;
y = r2;                  ||
```

Behavior in question: `r1 = r2 = 1`.

(d)

```
Initially, x = y = z = 0.

r1 = x;          || do {
if (r1 == 0)     ||     r2 = y;
    y = 1;       ||     r3 = z;
else             || } while (r2 + r3 == 0);
    z = 1;       || x = 1;
```

Behavior in question: `r1 = r3 = 1, r2 = 0`.

(e)

```
   Initially, x = y = z = w = 0.
r1 = z;  ||  r4 = w;
w = r1;  ||  r3 = y;
r2 = x;  ||  z = r3;
y = r2;  ||  x = 1;
```

Behavior in question: `r1 = r2 = r3 = r4 = 1`.

(f)

```
  Initially, x = y = 0.
x = 1;  ||  y = 1;
y = 2;  ||  x = 2;
r1 = y; ||  r2 = x;
```

Behavior in question: `r1 = r2 = 1`.

(g)

```
  Initially, x = y = 0.
r1 = x;        ||  r2 = y;
if (r1 == 1)   ||  if (r2 == 0)
    y = 1;     ||      x = 1;
```

Behavior in question: `r1 = r2 = 1`.