CS 271 Computer Architecture and Assembly Language
Self-Check for Lecture #15 **SOLUTION**

Given the following data segment:

```
.data
x     DWORD     17
y     DWORD     20
z     DWORD     13
```

Trace the following code fragments:

1.
```
        push    x       ;[esp]←17
        push    y       ;[esp]←20
        pop     x       ; x←20
        pop     y       ; y←17
```
x contains ___20____ y contains ___17____

2. Start over with original values in the data segment.
```
        push    x       ;[esp]←17
        inc     x       ; x←18
        pop     y       ; y←17
        push    x       ;[esp]←18
        inc     x       ; x←19
        pop     z       ; z←18
```
x contains ___19____ y contains ___17____ z contains ___18____

3. Start over with original values in the data segment. **(Shell Game?)**
```
        mov     eax,x       ; eax←17
        push    eax         ;[esp]←17  (17 will be at top when loop terminates)
        mov     ecx,4       ; ecx←4
again:
        push    x       ;[esp]←17   /[esp]←13   /[esp]←20   /[esp]←17
        push    y       ;[esp]←20   /[esp]←17   /[esp]←13   /[esp]←20
        push    z       ;[esp]←13   /[esp]←20   /[esp]←17   /[esp]←13
        pop     x       ; x←13,[esp]←20/x←20,[esp]←17/x←17,[esp]←13/x←13,[esp]←20
        pop     z       ; z←20,[esp]←17/z←17,[esp]←13/z←13,[esp]←20/z←20,[esp]←13
        pop     y       ; y←17,[esp]←17/y←13,[esp]←17/y←20,[esp]←17/y←17,[esp]←17
        loop    again   ; ecx←3  /ecx←2      /ecx←1      /ecx←0

        pop     z           ; z←17
```
x contains ___13____ y contains ___17____ z contains ___17____