

Homework 7 Solution

Problem 1.

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mes!

Problem 2.

Consider the following declaration:

```
short S[5];  
short *T[4];  
int **U[3];  
double V[2];  
char *W[3];
```

And fill in the following blanks:

Array	Size of Element	Size of Array	Start Address	Address of i-th Element
S	2	10	s	$s+2*i$
T	4	16	t	$t+4*i$
U	4	12	u	$u+4*i$
V	8	16	v	$v+8*i$
W	4	12	w	$w+4*i$

Problem 3

Consider the following declaration:

```
short S[5][6];  
int T[4][2];  
float U[3][1];  
char *V[2][0];  
char*((*W[3][4])0)[5];
```

And fill in the following blanks:

Array	Size of Element	Size of Array	Start Address	Element	Element addr
S	2	60	s	$S[i][j]$	$s+2*(i*6+j)$
T	4	32	t	$T[2][1]$	$t+4*(2*2+1)=t+20$
U	4	12	u	$U[1][0]$	$u+4*(1*1+0)=u+4$
V	4	0	v	/	/
W	4	48	w	$W[2][1]$	$w+4*(2*4+1)=w+36$

Problem 4.

A. In line 3, what value is assigned to %ebp

0x80003C

B. Where are local variables x and y stored (Indicate their addresses)

x: 0x800038

y: 0x800034

C. What is the value of %esp after line 10

0x800014

D. Draw a diagram to illustrate the stack frame after scanf returns

addr	Stack content	
0x80003C	0x800060	<- - %ebp
0x800038	0x53	x
0x800034	0x46	y
0x800030		
0x80002C		
0x800028		
0x800024		
0x800020		
0x80001C	0x800038	&x
0x800018	0x800034	&y
0x800014	0x300070	<- - %esp

E. Indicate the unused stack frame of proc(). (p.s. these areas are allocated to improve the performance of high-speed cache)

0x800020 ~ 0x800033 are unused.