

CMPE 230: Systems Programming
Midterm 2-A, Fall 2001

Problem 1 (7 pts)

What is the output of the following PERL program ?

```
#!/usr/bin/perl
@d = ("ali", "veli", 1..4) ;
$a = "" ;
OUTER:
foreach (@d) {
    $i = 1 ;
    while( $i < 100) {
        unless ($i % 2) {
            next OUTER ;
        }
        $a = $a . "cb" ;
        last if ($i > 9) ;
        $i++ ;
    }
    $a = $a . "b" ;
}
print "$a\n" ;
```

Problem 2 (8 pts)

What is the output of the following PERL program ?

```
#!/usr/bin/perl

$z = "aliye" ;
$q = "z" ;
$p = [ "z", "b", "c", [ "d", "e", [ "f", "i" ] , $$q ], "k" ] ;
print "$$p[3][2][0]\n" ;
$p->[3][2][1] = [ "z" , "y" ] ;
print "$p->[3][3]\n" ;
```

Problem 3 (10 pts)

What is the output of the following PERL program ?

```
#!/usr/bin/perl

$y = 4 ;
$x = 4 ;

$s1 = sub { local $x ; $x = 5 ; print "$x $y\n" ; &s2 } ;

&$s1 ;
@_ = ( "veli" ) ;
&s2 ;

sub s2 { print "$y $x @_[0]\n" ; }
```

Problem 4 (25 pts)

The following A86 program inputs a string (terminated by 'return' key). It then searches this string to see if ali is a substring of this input string. If it is, it prints y (for yes) and otherwise, it prints n (for no). Fill in the blanks in the code.

```
code segment
    mov ah,01h
    mov bp,iword
    mov bx,ali
    xor di,di
input:
    int 21h
    mov ----- ; /* (a) */
    inc di
    cmp al,13d
    jne input
loop1:
    mov si,0
compare:
    ----- ; /* (b) */
    mov al,[bx+si-1]
    cmp ----- ; /* (c) */
    jne nextpos
    cmp si,3d
    jne compare
    jmp found
nextpos:
    inc bp
    dec di
    ----- ; /* (d) */
notfound:
    mov dl,'n'
    jmp pprint
found:
    ----- ; /* (e) */
pprint:
    mov ah,02h
    int 21h
    int 20h
ali:
    db 'ali'
iword:
    db ?
code ends
```

Problem 5 (25 pts)

The following C program was compiled by gcc to generate GNU assembler code.

```
#include <stdio.h>

main()
{
    int i ;
    int a[4] ;

    for(i=3 ; i >= 0 ; i--) {
        a[i] = i ;
    }

    printf("%d %d %d %d\n",a[2],a[1],a[3],a[0]) ;
}
```

The GNU assembler code is given below. Fill in the blanks:

```
        .file    "ex.c"
        .version    "01.01"
gcc2_compiled.:
.section    .rodata
.LC0:
        .string "%d %d %d %d\n"
.text
        .align 4
.globl main
        .type    main,@function
main:
    pushl %ebp
    movl $3,%ecx
    movl %esp,%ebp
    subl $24,%esp
    leal -16(%ebp),%eax
    .p2align 4,,7
.L21:
    movl %ecx,(%eax,_____,_____)    /* (a,b) */
    decl %ecx
    jns .L21
    movl -16(%ebp),%eax
    addl $-12,%esp
    pushl %eax
    movl _____,%eax    /* (c) */
    pushl %eax
    movl _____,%eax    /* (d) */
    pushl %eax
    movl _____,%eax    /* (e) */
    pushl %eax
    pushl $.LC0
    call printf
    movl %ebp,%esp
```

```
        popl %ebp
        ret
.Lfe1:
        .size    main, .Lfe1-main
```

Problem 6 (25 pts)

You are given a datafile called `IPfile` which contains IP numbers of eligible users on each line. Implement a PERL CGI program that prints a form consisting of :

- Name and a text box for input
- Password and password box for input

When the form is submitted, the same CGI program should do the following:

1. Check to see whether the user's IP number is valid (i.e. whether it is in the `IPfile`).
2. If the IP number is in `IPfile`, then the program should print the name and the password encoded using MD5 in a paragraph. If the IP number is NOT in the `IPfile`, then it should print, "you are not authorized to use this service".
3. After printing (2) above, the program should print the form again.