

ANKARA UNIVERSITY
Computer Engineering Department
COM 101B
MIDTERM #1
Date: 13/11/2013
Instructor: Dr. Hacer Yalim Keleş

Student ID:
Name & Surname:

Question #	Total Points	Student Grade
1	10	
2	10	
3	10	
4	15	
5	10	
6	5	
7	10	
8	10	
9	10	
10	10	
	Grade:	

1- (10 points, 2 pts. each)

What are the values of the variables? Write the values of each variable into the table.

x: float, i,j,k = int

	i	j	k	x
(a) x=i=j=k=1; k += - i++ + ++j;				
(b) x=1; i=2; j=3; k=4; x -= k *= j /= i % 5;				
(c) k=0; i=1; j=2; x=3; x /= j = ++i * 2.5;				
(d) k=0; x=0; i=j=10; i %= j = (j=5) % (i=3)				
(e) x=5; i=4; j=3; k=1; x*= 1 + (i %= 1+(j/=-1+++k))				

2- (10 points, 2 pts. each)

Given that x=4, y=2 and z=5, what is the value of the following expressions? Write them into the table.

(a) !(x>y) && !(x-y<=z)	
(b) x>y && x<=z x*y<=z	
(c) !(x*y<=) && x>y	
(d) x>y && (x<=z x*y<=z)	
(e) x>y x*y<=z && x>y	

3- (10 points, 2 pts. each)

For $u=0$, $v=1$, $w=1$; what is the value of the following expressions? Write them into the table.

$--u \ \ --v \ \&\& \ --w$	
$--u \ \&\& \ --v \ \ --w$	
$(u > v ? v : w) * (u < v ? (!u ? v : w) : (w ? v : u + w))$	
$(u < v ? u : v) / (u > v ? (u ? u : v) : (!v ? u : v))$	
$v ? ++v + w++ : u ? u++ : ++v$	

4- (15 points, 5 pts. each) What is the output of the programs shown below? Write the outputs into the table. (Assume that necessary libraries are included)

<pre>int i,j; for(j=2,i=3;i<=8;i+=2) j+=i; printf("%d %d\n",i,j);</pre>	
<pre>int i,j; for(j=2,i=3;i<=8;i+=2) { j+=i; if(j>6) break; } printf("%d %d\n",i,j);</pre>	

<pre> int i,j; for(j=2,i=3;i<=8;i+=2) { if(j==5) continue; j+=i; } printf("%d %d\n",i,j); </pre>	
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5- (10 points) What is the output of the following program? Write the outputs into the table.

<pre> #include <stdio.h> int i=0; void f(void) { int i; i=1; } void g(void) { i=2; } void h(int i) { i=3; } int main() { { int i=4; printf("%d\n",i); } printf("%d\n",i); f(); printf("%d\n",i); g(); printf("%d\n",i); h(i); printf("%d\n",i); return 0; } </pre>	
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6- (5 points) What is the output of the following program? Write the outputs into the table.

<pre>#include <stdio.h> int main() { int x = 0; int y = 0; if(++x ++y) y += x++; printf("%d %d\n",x,y); }</pre>	
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7- (10 points) What is the output of the following program? Write the outputs into the table.

<pre>#include <stdio.h> char mystr[] = "stressed"; int main() { int i,j,c; for(j=0;mystr[j]!='\0';j++) ; for(i=0, j--;i<j;i++,j--) { c=mystr[i]; mystr[i] = mystr[j]; mystr[j] =c; } printf("%s\n",mystr); return 0; }</pre>	
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8- (10 points) What is the output of the following program? Write the outputs into the box below.

```
#include <stdio.h>

int matrix1[4][3] = {{1,1},{1,0,1},{0,1},{1}};
int matrix2[4][3] = {1,1,1,0,0,1,0,1,1,1};
int matrix3[4][3];

int main()
{
    int i,j,c=0;

    for(i=0;i<4;i++)
        for(j=0;j<3;j++)
            matrix3[i][j] = matrix1[i][j] && matrix2[i][j];

    for(i=0;i<4;i++)
    {
        for(j=0;j<3;j++)
        {
            printf("%d ",matrix3[i][j]);
        }
        printf("\n");
    }

    return 0;
}
```

Output:

- 9- (10 points) Write a recursive `digit_sum` function which returns the sum of the digits of a number.
(ex: `digit_sum(2651)` returns $2+6+5+1$, which is 14)

Function definition:

- 10- (10 points) **power** is a function which takes two integer arguments, namely the base and the exponent and returns (integer type) $\text{base}^{\text{exponent}}$. Ex: `power(3,2)` returns 9, which is equivalent to $3*3$. Write power function using recursion and simple arithmetic operations.

Function definition: