Questio	n	[20 Points - 2 Points each]
Write a	C statement or a set of statements to accomplish	each of the following:
1.	Read three integers from the keyboard and store them in the variables \mathbf{x} , $\ \mathbf{y}$ and \mathbf{z}	
2.	Calculate the reminder after ${\bf q}$ is divided by divisor and assign the result to ${\bf q}$.	
3.	Sum the odd integers between 1 and 99 using a for statement. Assume the variables sum and i have been defined.	
4.	Display the value of the 7^{th} element of a character array ${ t f}$.	
5.	Total the number of elements of a floating point array ${\tt c}$ of 100 elements.	
6.	Write a function prototype for a function exchange() that takes two pointers to floating point numbers x, y as parameter and does not return any values.	
7.	Read an integer ${\tt n}$ from the keyboard or a file until end-of-file is read, then print how many entries it read.	
8.	Assume: int array[100]; int *p; Assign the starting address of the array to the pointer p.	

Name:		
9.	Dynamically allocate in the heap, 100 integer	
	memory space and initialize a pointer to the first memory location.	
10.		
	Define a symbolic constant YES to have a value of 1	

Question [20 Points]

Assume you have written the following program largest.c:

```
1 #include <stdio.h>
 2
 3 int main( void ) {
 4
 5
           int i = 0,
 6
                num,
 7
                largest;
 8
9
           while ( fscanf(stdin, "%d", &num) != EOF ) {
                    if ( i == 0 ) largest = num;
10
11
                    if ( number > largest )
12
                            largest = num;
13
                    i++;
14
           Fprintf( stdout, "Largest %d of %d numbers\n", largest, i );
15
16
17
           return 0;
18 }
```

How would you compile this program in a Linux machine? [2 Points]

What will be the name of your executable: [2 Points]

Clearly explain the phases that a C program needs to go through to be executed. It may be easier to explain using a diagram. Identify each phase, indicating what happens in each stage. [6 Points]

CST8234 – C Programming Sample Questions Midterm I Name:
After attempting compilation, you get the following error message:
<pre>largest.c: In function 'main': largest.c:11: error: 'number' undeclared (first use in this function)</pre>
What is this error indicating? From which phase is error is coming? Fix the error. [3 Points]
Assume the above error has been fixed. After attempting compilation, you get the following error message: /tmp/ccQTtFkz.o: In function `main': largest.c:(.text+0x6f): undefined reference to `Fprintf' collect2: ld returned 1 exit status
What is this error indicating? From which phase is error is coming? Fix the error. [3 Points]
Assume the above error has been fixed. You program has successfully compiled. How many numbers will you program read? Explain your answer. [2 Points]

Sample Questions Midterm I Name:
Modify the $largest.c$ program to read the values from a file instead of the keyboard. Clearly explain the modifications you'll do – if any – and the way you will run your program. [2 Points]
Question [20 Points]
Given the following variables declarations. Assumption:
SIZE has been defined as 5 integer is stored in 4 bytes char is stored in 1 byte ASCII value of A is 65 starting address of the array is 1002500
<pre>int num = 78; int *p; int array[SIZE] = { 0, 1, 2, 3, 4 }; char c[SIZE] = { 'A', 'B', 'C', 'D', 'E'};</pre>
Create a memory map, for the above variables, indicate initial values for each of them [6 Points]

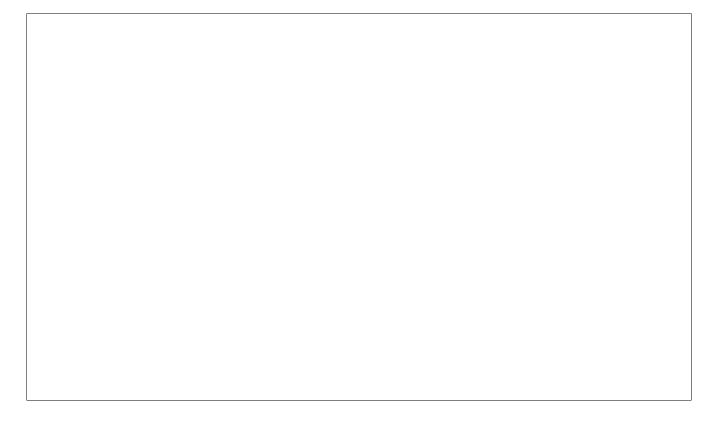
Name:	:
	<pre>p = array[3]; *p = (int) *c;</pre>
Create	a memory map, for the above code, indicate values for each of them [4 Points]
	<pre>p++; array[4] = num;</pre>
	p++;
Create	a memory map, for the above code, indicate values for each of them [6 Points]
	<pre>p = c; p++;</pre>
0	
[4 Poin	a memory map, for the above code, indicate values for each of them – indicate any abnormal behaviour its]
L	

Name:		

Section V [20 Points]

Assume you have the following functions (you can use them, no need to write them).

Write a small function in C-like code $search_array()$ to search for a number n in an array a. $search_array()$ should return the number of times that n was found. Your function should not do any printing. In the function header, indicate which arguments are passed by value and which are passed by reference. [5 Points]



Name:
Write a small function in C-like code $\min_{max_array}()$ to find the minimum and maximum numbers in an array a. $\min_{max_array}()$ should return nothing. Your function should not do any printing. In the function header, indicate which arguments are passed by value and which are passed by reference. [5 Points]

Write a C-like program to do the following – please notice that you may need to use more variables that the ones stated here [10 Points]

- 1. Declare a pointer to an integer
- 2. Allocate memory in the heap for an integer array of size N
- 3. Assign the new memory allocated to the pointer-based
- 4. Find the size of the array
- 5. Initialized the array with random numbers
- 6. Ask the user for a number
- 7. Indicate to the user if the number is part of the array
- 8. Find the minimum and maximum numbers in the array print them
- 9. Print the array

[Use the next page to write your code -- Please notice that marks in the question are independent of what your functions are correct or not.]

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