$CS241 #02 *See C Crash !*

1. What is the C preprocessor? Give 3 examples of its use in a .c file

When is sizeof evaluated?  
What would be a good name for the following macro? What must be true for A?

#define NAME(A) sizeof(A) / sizeof(A[0])

2. Complete the following code to return 1 if the c string contains @ character,0 otherwise.  
Where will the code crash if called with NULL containsAt(NULL);

1. int containsAt(char\* ptr) {

3. Explain how C uses memory from the process address space in each line of the following. (eg. stack, text segment, heap, global). Where do you expect this code to fail?

|  |
| --- |
| 1. int global; 2. void test() { 3. char\* t1 = "hi"; // Initialize a pointer 4. char t2[] = "abcdefgh"; // copies bytes 5. \*t2 = 'A'; 6. \*(t2 + 1) = 'B'; 7. t2[1] = 'B'; 8. \*t1 ='H'; 9. t1 = malloc(123); 10. } |

4. Why is this code broken?

1. #define max(a,b) a<b ? a : b
2. int result = max(10,5) + 1;
3. printf("Result:%d", result);

5. Spot the error(s)

1. double\* f1(int n) {
2. int i;
3. double\* r = malloc( n\* sizeof (double\*) );
4. while( i < n) r[i++] = 12.3;
5. return r;
6. }

6. Is the following line valid?

printf("%p %p", main, malloc);

7. Pointer arithmetic

Write a function to return the number of items in an int array before a value of -1 is found. Tricky: Use pointer arithmetic (no counters allowed!)

1. count\_before(int\* array) {
2. int\* ptr = array;

8. What would you call at line 2 such that p1 can be equal to p2?

1. void\* p1 = malloc( 10 );
2. ??\_\_\_\_\_
3. void \*p2 = malloc(8);

9 What are asprintf sprintf and fprintf?

10. For the start of the program, main(int argc, char\*\* argv)

What is special about argv[0]

What is special about argv[argc]

How do you print out all of the arguments of a program?

1. int main(int argc, char\*\* argv) {

11. Which of the following would print out an address in the stack?

1. int abc = 5;
2. int main() { f1( 10, &abc); return 0;}
3. int f1(int v1, int\* v2) {
4. printf("&v1 is %p \n", &v1);
5. printf("&v2 is %p \n", &v2);
6. printf(" v2 is %p \n", v2);
7. }

12 What are strcpy, strcat, strlen, strcmp ?

13 Which of the following is/are incorrect?

1. const char\* f1() {
2. const char blah[] = "Hello";
3. return blah;
4. }
5. const char\* f2() {
6. const char\* foo = "Hi";
7. return foo;
8. }
9. char\* f3() {
10. char\* yo = malloc(2);
11. strcat(yo, "Hi");
12. return yo;
13. }

14. How do I change your variable? Complete the main function to print the message created by the getMessage function

1. void getMessage(char\*\*magic) {
2. \*magic = malloc(10);
3. strcpy(\*magic, "Amazing C!");
4. }
5. int main() {
6. char\* ptr = NULL;
7. ?
8. puts( \_\_\_\_\_);
9. }