## 93.5 Fall 2013

## CSC 111 Fall 2013 Midterm 2

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7	m	uei	при	all	O U	esti	ons.

- This midterm is closed-books, closed-notes, no calculators, no gadgets, and no electronic devices.
- Turn in your completed midterm in at the front of the class. Show your UVic ID Card.
- Do not leave before 45 minutes after the start of the midterm.

		er consists of two parts: a real (re) and an imaginary (im) part. Which of the following lefines a syntactically correct struct type Complex? [4]
	$\bigcirc$	structure { double re; double im; } Complex;
10		typedef struct {double re, im; } Complex;
7		typedef struct Complex {double re, im }
	$\bigcirc$	struct Complex (double re, im; );
% Whic	h of the follo	owing is true? [4]
1		Each component of a struct is assigned the same area of storage space.
4	$\bigcirc$	The syntax for structs is basically the same as for arrays.
		Each component of a struct must have the same type.
A Principle		Components of structs can have different types.
3. In the	e C program	ming language, how do you refer to a file when you read, write or close a file? [4]
1,		fopen()
4	$\bigcirc$	printf()
		FILE* pointer
	$\bigcirc$	fgetc()
71)		1

4. Consider the following syntactically correct C declarations: [6]

```
#include <string.h>
#define MAX SIZE (300)
```

```
typedef struct {
     char first[MAX SIZE];
     char last[MAX SIZE];
     float mark;
} Person:
Person student;
```

Initialize variable student with your first and last name as well as the mark you hope to get on this midterm. Hint: Use a function defined in the C standard library <string.h> such as strlen(str), strcmp(str1, str2), strcpy(dest, source), or strcat(dest, source).

```
person student;
Stropy (Stodent , first, "Heather");
strepy (student . 1954, "Cape");
 student. mank = 100.0;
```

5. Assume the following syntactically correct C declarations. [4]

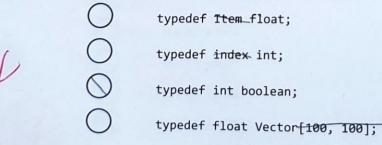
```
#define MAX SIZE (300)
char str[MAX SIZE];
```

Describe the difference between the following two syntactically correct C statements.

```
a) scanf("%s", str); (NO LIMIT
```

scant would get a user inputed string assigned to the array str (this has no characterismit assigned), facts on the other hand, has a limit to the amount of characters it can read about in str. MAX-SIZE is the limit, and the string is obtained Inom Standard input,

6. Which one of these declarations is a syntactically correct C type declaration? [4]



7. What is the output of the following syntactically correct C program? [8]

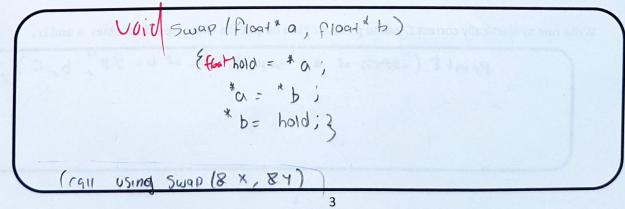
```
#include <stdio.h>
#include <stdib.h>
#define MIN (-4)
#define MAX (4)
#define MOD (3)
int main(void) {
   int k, z;
   for (k=MAX; k > MIN; k--) {
        z = k % MOD;
        printf("%d", z);
   } /*for*/
   printf("\n");
   return EXIT_SUCCESS;
} /*main*/
```

Output:

The following Boolean expression

Assume the following syntactically correct C declarations. Which one of the following Boolean expressions evaluates to false or 0? [4]

9. Write a syntactically correct C function called swap () to exchange the values of two float values accessed via parameters. [8]



10. Consider the following syntactically correct C program called reflection.c. What is the effect when you execute this program? [6]

```
#include<stdio.h>
#include<stdlib.h>
#define MAX (300)
#define FNAME ("reflection.c")
int main(void) {
      char line[MAX];
      FILE *ifp = fopen(FNAME, "r");
      if (ifp == NULL) {
             printf("Input file %s not found\n", FNAME);
             exit(EXIT FAILURE);
      } /*if*/
      int n = 0;
      while(!feof(ifp)) {
             if (fgets(line, MAX, ifp)) n++;
       } /*while*/
      printf("n = %d\n", n);
      fclose(ifp);
      return EXIT SUCCESS;
} /*main*/
             This program will create a new file.
             This program will output the program text of this program.
             This program will count the number of lines in its source file reflection.c
             This program will copy file reflection.c to standard output.
```

11. Consider the following syntactically correct C declarations and assignments. [6]

```
int a;
int *b;
int **c;
a = 17;
b = &a;
c = &b;
```

Write one syntactically correct C call to printf() to output the addresses of variables a and b.



```
(12.) What is the console output of the following syntactically correct C program? [6]
     #include <stdio.h>
     #include <stdlib.h>
     #include <string.h> v v v 5
     #define OUTPUT (" Once upon a time there was a polar\n")
     int main (void) {
           char str[] = OUTPUT; | 0 | U | T | P | U | T | /o
           FILE *ifp;
           FILE *ofp;
                                                        programming is reasy costs.
           ofp = fopen("csclll.txt", "w");
          fputs("Programming is really cool!\n", ofp);
           fclose(ofp);
           ifp = fopen("csc111.txt", "r");
           while (!feof(ifp)) = 1 not at the cood
                if (fgets(str, strlen(str), ifp) != NULL) {
                      printf("%s", str);
                }/*if*/
           }/*while*/2 & 2 3 4
          (printf("My favorite course is CSC 111!\n");
                                                           9 string Find
           fclose(ifp);
                                                          with a total
           return EXIT SUCCESS;
                                                           the limit length
      } /*main*/
                                                           the size of
                                                          OUTPUT and
                Once upon a time there was a polar bear
                                                           puts it in str
                Programming is really cool!
                My favorite course is CSC 111!
                My favorite course is CSC 111!
                Programming is really cool!
                My favorite course is CSC 111!
                Programming is really cool!
```

```
13. What is the output of the following syntactically correct C program? [8]

#include <stdio.h>
#include <stdlib.h>
#define VSize (4)
```

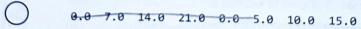
```
typedef int Index;
typedef float Item;
typedef Item Vector[VSize];

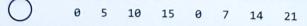
void initVector(Vector V, Index size, Item z) {
    Index k;
    for (k=0; k<size; k++) V[k] = (Item)(k)*z;
} /*initVector*/

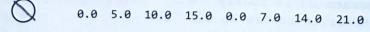
void printVector(const Vector V, Index size) {
    Index k;
    for (k=0; k<size; k++) printf("%.lf ", V[k]);
} /*printVector*/</pre>
```

```
int main(void) {
    Vector Vec;
    initVector(Vec, VSize, 5.0);
    printVector(Vec, VSize);
    initVector(Vec, VSize, 7.0);
    printVector(Vec, VSize);
    printf("\n");
    return EXIT_SUCCESS;
} /*main*/
```









14. Assume the following syntactically correct C code. Write a loop that fills the array with the following repeated character sequence <->. Make sure you don't write past the end of the array. Hint: Use a for loop with if statements inside the for loop. [8]

```
#include <stdio.h>
#include <stdlib.h>
#define MAX (200)
int main(void) {
     char buffer[MAX];
     int k;
     for (K=0; KCMAX-1; K++j)
     for (k=0; k<MAX; k++) printf("%c", buffer[k]);
     return EXIT SUCCESS;
  /*main*/
```

15. What is the output of the following syntactically correct C program? [6]

```
#include <stdio.h>
#include <stdlib.h>
typedef struct {
     int day; int month; int year;
} Date;
void initDate(Date* d) {
     d->day = 19; d->month = 11; d->year = 1999;
} /*initDate*/
int printDate(Date d) {
    printf("Date: %d/%d/%d\n", d.day, d.month, d.year);
     return EXIT SUCCESS;
} /*printDate*/
int main(void) {
     Date bd = \{99, 99, 99\};
     printDate(bd); initDate(&bd); printDate(bd);
    return EXIT SUCCESS;
} /*main*/
```

16. What is the output of the following syntactically correct C program? [8] #include <stdio.h> #include <stdlib.h> #define VSIZE (4) typedef float Vector[VSIZE]; Arst: 1.1 void func1(Vector a, int len) { int k; float first = a[0]; for (k=0; k<len-1; k++) a[k] = a[k+1]; funct a[len-1] = first; } /\*func1\*/ void func2 (Vector a, int len) { for (k=0; k<len; k++) printf("%.1f ", a[k]); printf("\n"); } /\*func2\*/ int main (void) { Vector vec: vec[0] = 1.1; vec[1] = 5.5; vec[2] = 4.4; vec[3] = 3.3;func1(vec, VSIZE); func1(vec, VSIZE); func2(vec, VSIZE); Vec return EXIT SUCCESS; } /\*main\*/ 107 117 4.4 3.3 5.5 4.4 3.3 1.1 5.5 5.5 3.3 1.1 17. What is the output of the following syntactically correct C program? [6] #include <stdio.h> #include <stdlib.h> int main(void) { int z = 0; int n = 13; int k = 1; int\*p = &k;while (\*p <= n) { 2=0 0:0+1 z = z + \*p;n = 13 \*p = \*p + 2;} /\*while\*/ printf("n = %d z = %d\n", n, z); return EXIT SUCCESS; } /\*main\*/ Z=1 2=4 2=9 2=16 7= 35 n = 13 z = 7211:13 1013 h=13 1=13 n = 13 z = 36P=B P= 13 n = 13 z = 662= 49 z = 36 n = 13 z = 49