Who wants to be a C programmer

Preparation for midterm

Game 2

Question 1. 500 points

```
int main() {
    int contestants[] = {1, 2, 3, 4};
    int *choice = contestants;
    contestants[0] = 2;
    contestants[1] = contestants[2];
    contestants[2] = *choice;
    printf("I'm going to pick contestant number %i\n", contestants[2]);
    return 0;
}
```

What contestant was picked by our automated system?

A	3	C	2
B	1	D	4

Question 1. 500 points

```
int main() {
    int contestants[] = {1, 2, 3, 4};
    int *choice = contestants;
    contestants[0] = 2;
    contestants[1] = contestants[2];
    contestants[2] = *choice;
    printf("I'm going to pick contestant number %i\n", contestants[2]);
    return 0;
}
```

What contestant was picked by our automated system?

A 3	C 2
B 1	D 4

The correct answer is C.

Question 2. 1,000 points

ln myfile yourfile

What is the result of executing the command above?

A	Copy of *myfile* is created and is called *yourfile*
B	*myfile* is renamed to *yourfile*
C	The same file *myfile* now can be accessed though a different file name
D	A new file which combines content of both files is created

Question 2. 1,000 points

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What is the result of executing the command above?

A	Copy of *myfile* is created and is called *yourfile*
B	*myfile* is renamed to *yourfile*
C	The same file *myfile* now can be accessed though a different file name
D	A new file which combines content of both files is created

The correct answer is C.

Question 3. 2,000 points

```
int x = 10;
void func() {
    int a = 0;
    int *p = &a;
    
    p = &x;
    p = malloc (5* sizeof (int) );
}
```

Variable *int *p* is declared on the stack. What memory segment it points to when the program reaches the place indicated by a star?

A	Heap
B	Stack

C	Constants
D	Globals

Question 3. 2,000 points

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A	Heap
B	Stack

C	Constants
D	Globals

The correct answer is B.

Question 4. 3,000 points

```
int x = 10;
void func() {
    int a = 0;
    int *p = &a;
    p = &x;
    *
    p = malloc (5* sizeof (int) );
}
```

Variable *int *p* is declared on the stack. What memory segment it points to when the program reaches the place indicated by a star?

A	Globals	C	Heap
B	Stack	D	Constants

Question 4. 3,000 points

```
int x = 10;
void func() {
    int a = 0;
    int *p = &a;
    p = &x;
    *
    p = malloc (5* sizeof (int) );
}
```

Variable *int *p* is declared on the stack. What memory segment it points to when the program reaches the place indicated by a star?

A	Globals	C	Heap
B	Stack	D	Constants

The correct answer is A.

Question 5. 5,000 points

```
int x = 10;
void func() {
    int a = 0;
    int *p = &a;
    p = &x;
    p = malloc (5* sizeof (int) );
    
}
```

Variable *int *p* is declared on the stack. What memory segment it points to when the program reaches the place indicated by a star?

A	Stack
B	Heap

C	Constants
D	Globals

Question 5. 5,000 points

```
int x = 10;
void func() {
    int a = 0;
    int *p = &a;
    p = &x;
    p = malloc (5* sizeof (int) );
    *
}
```

Variable *int *p* is declared on the stack. What memory segment it points to when the program reaches the place indicated by a star?

A	Stack	C	Constants
B	Heap	D	Globals

The correct answer is B.

Checkpoint 1 reached!

You have 5,000 points

Question 6. 7,500 points

```
int *fun (char *p) {
    int *int_ptr = malloc (sizeof (int) );
    if (p [0] == 'Z') {
        *int_ptr = 1;
    } else {
        *int_ptr = 5;}
    return int_ptr;
}
```

```
int main() {
    char letters[10] = "abc";
    int *x;
    x = fun (letters);
    return 0;
}
```

How much new memory is allocated when program executes line , and where is it allocated?

A	sizeof (int) on the heap
B	sizeof (int) on the stack
C	sizeof (int *) on the stack and sizeof (int) on the heap
D	2*sizeof (int) on the heap

Question 6. 7,500 points

```
int *fun (char *p) {
    int *int_ptr = malloc (sizeof (int) );
    if (p [0] == 'Z') {
        *int_ptr = 1;
    } else {
        *int_ptr = 5;}
    return int_ptr;
}
```

```
int main() {
    char letters[10] = "abc";
    int *x;
    x = fun (letters);
    return 0;
}
```

How much new memory is allocated when program executes line , and where is it allocated?

A	sizeof (int) on the heap
B	sizeof (int) on the stack
C	sizeof (int *) on the stack and sizeof (int) on the heap
D	2*sizeof (int) on the heap

The correct answer is C.

Question 7. 10,000 points

```
int *fun (char *p) {
    int *int_ptr = malloc (sizeof (int) );
    if (p [0] == 'Z') {
        *int_ptr = 1;
    } else {
        *int_ptr = 5;}
    return int_ptr;
}
```

```
int main() {
    char letters[10] = "abc";
    int *x;
    x = fun (letters);
    return 0;
}
```

How much new memory is allocated when program executes line , and where is it allocated?

A	10*sizeof (char) on the stack and 4*sizeof(char) in constants
B	10*sizeof (char) on the stack
C	sizeof (char *) and 10*sizeof (char) on the stack
D	10*sizeof (char) in Constants

Question 7. 10,000 points

```
int *fun (char *p) {
    int *int_ptr = malloc (sizeof (int) );
    if (p [0] == 'Z') {
        *int_ptr = 1;
    } else {
        *int_ptr = 5;}
    return int_ptr;
}
```

```
int main() {
    char letters[10] = "abc";
    int *x;
    x = fun (letters);
    return 0;
}
```

How much new memory is allocated when program executes line , and where is it allocated?

A	10*sizeof (char) on the stack and 4*sizeof(char) in constants
B	10*sizeof (char) on the stack
C	sizeof (char *) and 10*sizeof (char) on the stack
D	10*sizeof (char) in Constants

The correct answer is B.

Question 8. 15,000 points

```
int depth = 4;
int *p3 = &depth;
int x;
x = *p3 + 5;
```

```
depth = 1;
```

What are the values stored in variables *depth*, *x*, and **p3* at the moment of execution indicated by a star?

A	depth: 4, x: 4, *p3: 4
B	depth: 4, x: 9, *p3: 4

C	depth: 9, x: 9, *p3: 9
D	depth: 4, x: 9, *p3: 9

Question 8. 15,000 points

```
int depth = 4;
int *p3 = &depth;
int x;
x = *p3 + 5;
```

```
depth = 1;
```

What are the values stored in variables *depth*, *x*, and **p3* at the moment of execution indicated by a star?

A	depth: 4, x: 4, *p3: 4
B	depth: 4, x: 9, *p3: 4

C	depth: 9, x: 9, *p3: 9
D	depth: 4, x: 9, *p3: 9

The correct answer is B.

Question 9. 25,000 points

```
int depth = 4;
int *p3 = &depth;
int x;
x = *p3 + 5;
depth = 1;
```

What are the values stored in variables *depth*, *x*, and **p3* at the moment of execution indicated by a star?

A	depth: 1, x: 9, *p3: 4
B	depth: 1, x: 9, *p3: 1

C	depth: 1, x: 1, *p3: 4
D	depth: 1, x: 1, *p3: 1

Question 9. 25,000 points

```
int depth = 4;
int *p3 = &depth;
int x;
x = *p3 + 5;
depth = 1;
```

What are the values stored in variables *depth*, *x*, and **p3* at the moment of execution indicated by a star?

A	depth: 1, x: 9, *p3: 4
B	depth: 1, x: 9, *p3: 1

C	depth: 1, x: 1, *p3: 4
D	depth: 1, x: 1, *p3: 1

The correct answer is B.

Question 10. 50,000 points

```
char c[6] = "ABCDE";
char *p = c;
char *s = p + 2;
printf("%c\n", p[0]);
printf("%s\n", p + 1);
printf("%c\n", s[0]);
```

What output is printed to stdout?

A	A B C
B	A BCDE B
C	The code will not run because of a compilation error
D	A BCDE C

Question 10. 50,000 points

```
char c[6] = "ABCDE";
char *p = c;
char *s = p + 2;
printf("%c\n", p[0]);
printf("%s\n", p + 1);
printf("%c\n", s[0]);
```

What output is printed to stdout?

A	A B C
B	A BCDE B
C	The code will not run because of a compilation error
D	A BCDE C

The correct answer is D.

Checkpoint 2 reached!

You have 50,000 points

Question 11. 75,000 points

```
char * p;
char a1 [] = “first”;
char a2 [] = “second”;
p = a1;
p [5] = ‘\0’;
```

What happens if we write this code?

A	The code will not compile
B	The code will compile but always produce a run-time error
C	The code will compile and run with no errors
D	The code will compile and run, but sometimes give a run-time error

Question 11. 75,000 points

```
char * p;
char a1 [] = “first”;
char a2 [] = “second”;
p = a1;
p [5] = ‘\0’;
```

What happens if we write this code?

A	The code will not compile
B	The code will compile but always produce a run-time error
C	The code will compile and run with no errors
D	The code will compile and run, but sometimes give a run-time error

The correct answer is C.

Question 12. 150,000 points

```
char * p;
char a1 [] = “first”;
char a2 [] = “second”;
p = a1;
a2 = p;
```

What happens if we write this code?

A	The code will compile but always produce a run-time error
B	The code will not compile
C	The code will compile and run with no errors
D	The code will compile and run, but sometimes give a run-time error

Question 12. 150,000 points

```
char * p;
char a1 [] = “first”;
char a2 [] = “second”;
p = a1;
a2 = p;
```

What happens if we write this code?

A	The code will compile but always produce a run-time error
B	The code will not compile
C	The code will compile and run with no errors
D	The code will compile and run, but sometimes give a run-time error

The correct answer is B.

Question 13. 250,000 points

```
$ mkdir -
$ expr 9 * 4
```

What is printed when we execute these two shell commands?

A	36
B	The output depends on what other files are in the current directory
C	5
D	Error: non-integer argument

Question 13. 250,000 points

```
$ mkdir -
$ expr 9 * 4
```

What is printed when we execute these two shell commands?

A	36	C	5
B	The output depends on what other files are in the current directory	D	Error: non-integer argument

The correct answer is B.

Question 14. 500,000 points

```
int * ip;
long * lp;
double *dp;
printf (“%ld\n”,sizeof (ip));
printf (“%ld\n”,sizeof (lp));
printf (“%ld\n”,sizeof (dp));
```

What is printed on the 32-bit system?

A	4 8 8
B	4 8 4
C	4 4 4
D	8 8 8

Question 14. 500,000 points

```
int * ip;
long * lp;
double *dp;
printf ("%ld\n",sizeof (ip));
printf ("%ld\n",sizeof (lp));
printf ("%ld\n",sizeof (dp));
```

What is printed on the 32-bit system?

A	4 8 8
B	4 8 4
C	4 4 4
D	8 8 8

The correct answer is C.

Question 15. **One million points!**

```
int double1 (int x) {
    x = x + x;
    return x;
}
int double2 (int *x) {
    *x = (*x) + (*x);
    return *x;
}
```

```
int main() {
    int i = 10;
    int j = 0;
    j = double1(i);
    printf ("i = %d, j = %d\n", i, j);
    i = 10;
    j = double2(&i);
    printf ("i = %d, j = %d\n", i, j);
    return 0;
}
```

What is the output of this program?

A	i = 10, j = 20 i = 10, j = 20		C	i = 10, j = 20 i = 20, j = 20
B	i = 10, j = 10 i = 20, j = 20		D	i = 20, j = 20 i = 20, j = 20

Question 15. **One million points!**

```
int double1 (int x) {
    x = x + x;
    return x;
}
int double2 (int *x) {
    *x = (*x) + (*x);
    return *x;
}
```

```
int main() {
    int i = 10;
    int j = 0;
    j = double1(i);
    printf ("i = %d, j = %d\n", i, j);
    i = 10;
    j = double2(&i);
    printf ("i = %d, j = %d\n", i, j);
    return 0;
}
```

What is the output of this program?

A	i = 10, j = 20 i = 10, j = 20		C	i = 10, j = 20 i = 20, j = 20
B	i = 10, j = 10 i = 20, j = 20		D	i = 20, j = 20 i = 20, j = 20

The correct answer is C.

Well done!

You are ready for the midterm