Midterm exam

This is a preview of the published version of the quiz

Started: Oct 20 at 10:58am

Quiz Instructions

Question 1 **0 pts**

Honor Pledge

University of Maryland Honor Pledge: The University is committed to Academic Integrity, and has a nationally recognized Honor Code, administered by the Student Honor Council. In an effort to affirm a community of trust, the Student Honor Council proposed and the University Senate approved an Honor Pledge. The University of Maryland Honor Pledge Reads:

"I pledge on my honor that I have not given or received any unau
assistance on this examination (or assignment)"

Please write the exact wording of the Pledge, and sign it by typing your full name, in the space below:

HTML Editor

B I U A A 12pt Paragrap

0 words

Instructions

- The problems are of varying difficulty. The point value of each problem is indicated. Pile up the easy points quickly and then come back to the harder problems.
- You may only submit this quiz once, so make sure you answer all the questions before you do this.
- The quiz is not auto-graded. You will not receive your grade immediately after you finish the exam.
- This exam is OPEN BOOK. You may use any books or notes you like. Obviously, you may also use your computer.
- You may ask clarification questions on the Piazza message board. However, you are not allowed to post any information that would reveal your answer to the exam problems. If you are unsure, feel free to send us a private message on Piazza.
- While the exam quiz is open, you are not allowed to communicate with any of your classmates or to receive assistance from anybody other than the ENEE 140 instructors.

Good luck!

Question 2

15 pts

Below is a C program that prompts the user for a positive number and performs an operation on the number using a for loop, a while loop, and an array. This group of questions tests your knowledge of loops in C and of arrays. Your tasks are to:

a) Edit the code to convert the for loop into a while loop. You only have to edit the for loop and do not have to re-write the entire program.

b) Explain the purpose of the program (i.e. explain the meaning of the output).

```
#include <stdio.h>


int main(){

  unsigned int num, i, a[16];

  printf("Enter a positive number: ");
  scanf("%u", &num);

  for(i = 0; num > 0; i++){
    a[i] = num%4;
    num = num / 4;
  }

  while(i >= 1){
    printf("%u", a[i-1]);
    i--;
  }

  printf("\n");
  return 0;
}
```

HTML Editor

B I U A A Tx ≡ ≡ ≡ ≡ ≡ x² x₂ ≡ ≡

12pt Paragrap

0 words

Question 3

14 pts

The snippet below shows several variables being assigned with numbers, followed by several variables being assigned from mathematical expressions. Examine each of the expressions below for variables num1 through num6, and detail all instances where typecasting occurs. Be sure to specify whether each cast is explicit or implicit.

```
1   float    a = 1.2;
2   int      b = 3;
3   unsigned c = 4;
4   int      d = 5;
5   double   e = 6;
6
7
8   int num1 = b + d;
9   int num2 = c - d;
10  float num3 = d / b;
11  unsigned num4 = a * (float)d;
12  int num5 = e - b;
13  double num6 = d - b;
```

HTML Editor

B I U A A 12pt Paragrap

0 words

Question 4

12 pts

This question tests your knowledge of function behavior and program flow. The below program features a variety of variables and operations. If, after the program is run, r1 = 6, r2 = 7.50, and r3 = 3, what are the input values of x, y, and z?

```c
#include <stdio.h>

float f(float p, unsigned  q, unsigned s);


int main(){

  unsigned x, y, r1, r3;
  float z, r2;


  r1 = x + y;
  r2 = f(z, x, y);
  r3 = r2 / x;
  return 0;
}

float f(float p, unsigned q, unsigned s){
  float value;

  value = (p + q + s)/3;

  return value;
}
```

x =

y =

z =

Question 5

14 pts

This problem tests your knowledge on arrays, scanf, and loops and debugging these programs.

The given program is supposed to scan the size of an array (arraySize) and the maximum number that can be generated (limit), and create an array of size arraySize filled with random numbers less than or equal to limit. Then that array is sorted in ascending order using a sort function (not shown, but it is assumed it works and has no bugs).

YOUR TASK:

Find the bugs in the given code and write the correct line of code where the bug is. There are a total of 7 bugs.

```
#include <stdio.h>
#include <stdlib.h>
#include <time.h>

void sort(int a[], int size);
void printArray(int a[], int size);

int main(){
        int arraySize, limit, count,

        srand(time(0));

        print f("Enter the size of array\n");
        scanf("%d", arraySize);

        int array[arraySize];

        printf("Enter the upper limit\n");
        scanf("%d", &limit);

        count = 0;
        while(count <= arraySize){
                array[count] = (rand() % (limit +
1));
                count++;
        }

        printArray(array, &arraySize);

        sort(array, arraySize);

        printArray(array, arraySize);

        Return 0;
}

void printArray(int a[], int size){
        int i = 0;
        printf("Array: [");
        while(i < size){
                if(i != size - 1){
                        printf("%d, ", a[i]);
                } else {
                        printf("%d]\n", a[i]);
                }
                printf("%d, ", a[i]);
        }
}
```

HTML Editor

B I U A A 12pt Paragrap

0 words

Question 6

10 pts

This problem tests understanding of functions. Given the following code, write the appropriate function prototype for **get_test_result()**.

```
// FUNCTION PROTOTYPE HERE
```

```c
int main()
{
    unsigned UID = 12345;
    char class_code[] = "ENEE";
    int class_number = 140;
    unsigned test_number = 1;

    // determines a student's test score based on UID,
    // class code/number, and test number
    char grade = get_test_result(UID, class_code, class_number, test_n

    return 0;
}
```

HTML Editor

B I U A A 12pt Paragrap

0 words

Question 7

10 pts

For this question use the code snippet below (the same one as the previous problem) and assume that *get_test_result()* returns 'A'. Write a single statement using *printf()* to be inserted in the line above "return 0;" to obtain the following output:

Note: You may not "hard code" the **bold** text in the statement, you must obtain the values from the 4 variables in main().

```
UID: 12345
ENEE140 exam 1 score: A
```

```
// FUNCTION PROTOTYPE HERE

int main()
{
    unsigned UID = 12345;
    char class_code[] = "ENEE";
    int class_number = 140;
    unsigned test_number = 1;

    // determines a student's test score based on UID,
    // class code/number, and test number
    char grade = get_test_result(UID, class_code, class_number, test_n

    // printf() statement HERE

    return 0;
}
```

HTML Editor

B I U A A 12pt Paragrap

0 words

Question 8

15 pts

Write a program that starts by asking the user for a positive integer (you can assume the user will correctly enter a positive integer). Print a total of the numbers between 1 and the user's entered value that are evenly divisible by 5 (x % 5 = 0).

Example:

Enter a number: 27

Result: 5

(you only have to print the above two lines, but the numbers evenly divisible by 5 in this case are 5, 10, 15, 20, 25)

HTML Editor

B I U A A

Question 9

10 pts

The following code snippet is free of errors (issues that will prevent the code from compiling) but it does contain a major bug that will cause the program to hang (not finish running). Identify the problem and create a line of code to fix it.

```
#include <stdio.h>

char get_input();

int main() {
    printf("The user's inputted letter is %c\n", get_input());
    return 0;
}

char get_input() {
    printf("Please enter a letter: \n");
    char input = getchar();
```

```
    while (!(input >= 'a' && input <= 'z') && !(input >= 'A' && input <=
'Z')) {
        printf("You did not enter a letter! Try again\n");
    }

    return input;
}
```

HTML Editor

12pt Paragrap

0 words

Quiz saved at 11:00am

Submit Quiz