CALIFORNIA STATE POLYTECHNIC UNIVERSITY

Department of Computer Science

CS 2560

N.D.

Midterm

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GITHUB URL:

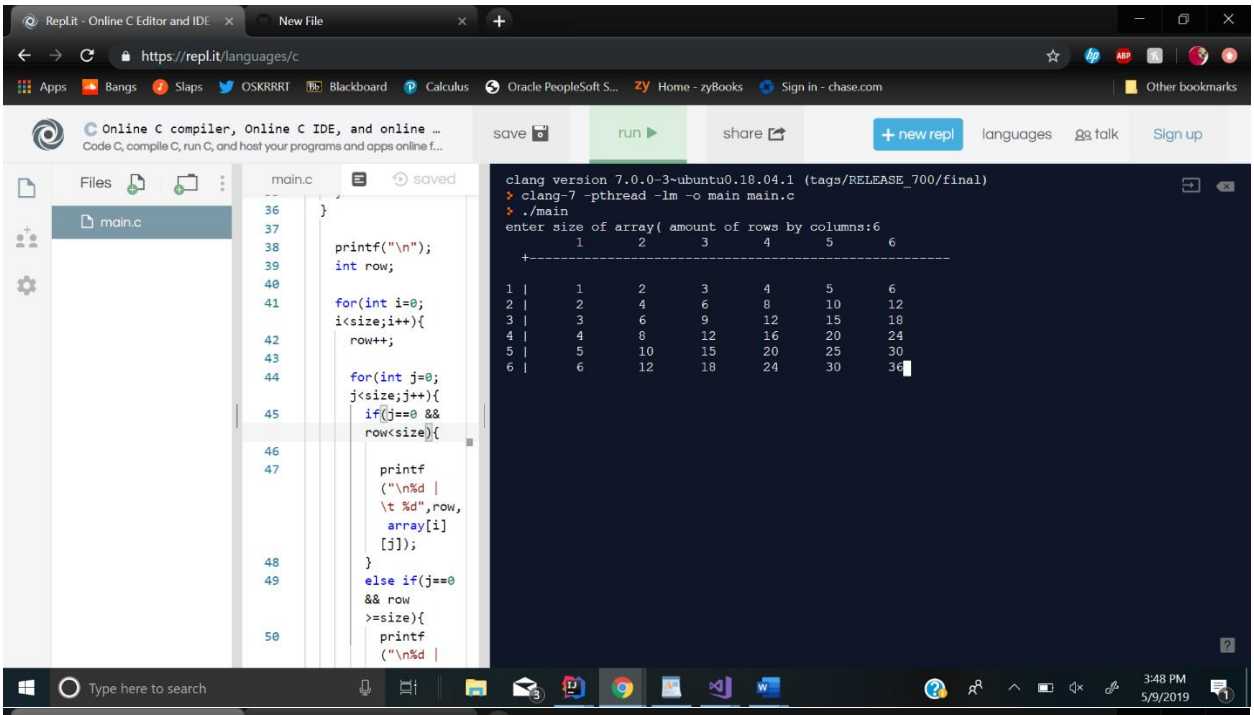
C Programming Assignments

NOTE: Use C libraries that have functions printf(), scanf()…etc

1) Write a program to print a multiplication table for integers.
   The program should input a single number from the user that corresponds to the row and column size. Additionally, the table should show rows, columns and symbols as shown below.

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

int main(int argc, char **argv) {
  //declarations
  int size;


  //user input
  printf("enter size of array( amount of rows by columns:");
  scanf("%d", &size);

int array[size][size];

  for (int i = 0; i < size; i++)
  {
    for (int j = 0; j < size; j++)
    {
      array[i][j] = (i + 1)*(j + 1);
    }
  }

  for(int i=0; i<size; i++){
    if(i==0){
```

```
    printf("\t\t %d", i+1);
  } else{
    printf("\t\t %d", i+1);
  }
}
for(int i=0;i<size+1; i++){
  if(i==0){
    printf("\n  +");
  } else{
    printf("---------");
  }
}

  printf("\n");
  int row;

  for(int i=0;i<size;i++){
    row++;

    for(int j=0; j<size;j++){
      if(j==0 && row<size){

        printf("\n%d |  \t %d",row, array[i][j]);
      }
      else if(j==0 && row >=size){
        printf("\n%d |   \t %d",row, array[i][j]);

      }
      else{
        printf("  \t %d", array[i][j]);
      }
       }
  }
  return 0;


  }
```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Online C compiler, Online C IDE, and online …
Code C, compile C, run C, and host your programs and apps online f…
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run
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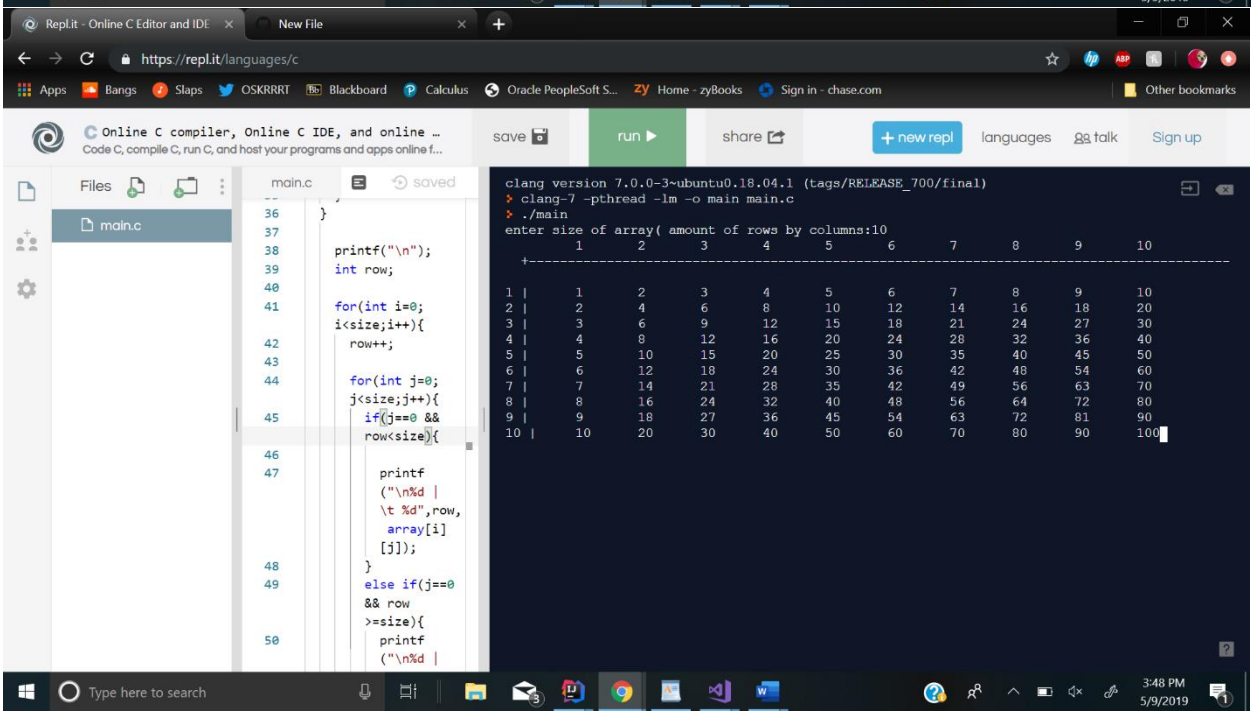
talk
Sign up
Files
main.c
saved
clang version 7.0.0-3~ubuntu0.18.04.1 (tags/RELEASE_700/final)
clang-7 -pthread -lm -o main main.c
./main
enter size of array(amount of rows by columns:6
1 2 3 4 5 6
1 | 1 2 3 4 5 6
2 | 2 4 6 8 10 12
3 | 3 6 9 12 15 18
4 | 4 8 12 16 20 24
5 | 5 10 15 20 25 30
6 | 6 12 18 24 30 36
Type here to search
3:48 PM
5/9/2019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New File
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Online C compiler, Online C IDE, and online …
Code C, compile C, run C, and host your programs and apps online f…
save
run
share
+ new repl
languages
talk
Sign up
Files
main.c
saved
clang version 7.0.0-3~ubuntu0.18.04.1 (tags/RELEASE_700/final)
clang-7 -pthread -lm -o main main.c
./main
enter size of array(amount of rows by columns:10
1 2 3 4 5 6 7 8 9 10
1 | 1 2 3 4 5 6 7 8 9 10
2 | 2 4 6 8 10 12 14 16 18 20
3 | 3 6 9 12 15 18 21 24 27 30
4 | 4 8 12 16 20 24 28 32 36 40
5 | 5 10 15 20 25 30 35 40 45 50
6 | 6 12 18 24 30 36 42 48 54 60
7 | 7 14 21 28 35 42 49 56 63 70
8 | 8 16 24 32 40 48 56 64 72 80
9 | 9 18 27 36 45 54 63 72 81 90
10 | 10 20 30 40 50 60 70 80 90 100
Type here to search
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Show contents of RAM

2) Given the following program show the contents of **RAM** when stack is at **maximum** size.

NOTE: *you must show all 4 segments!*

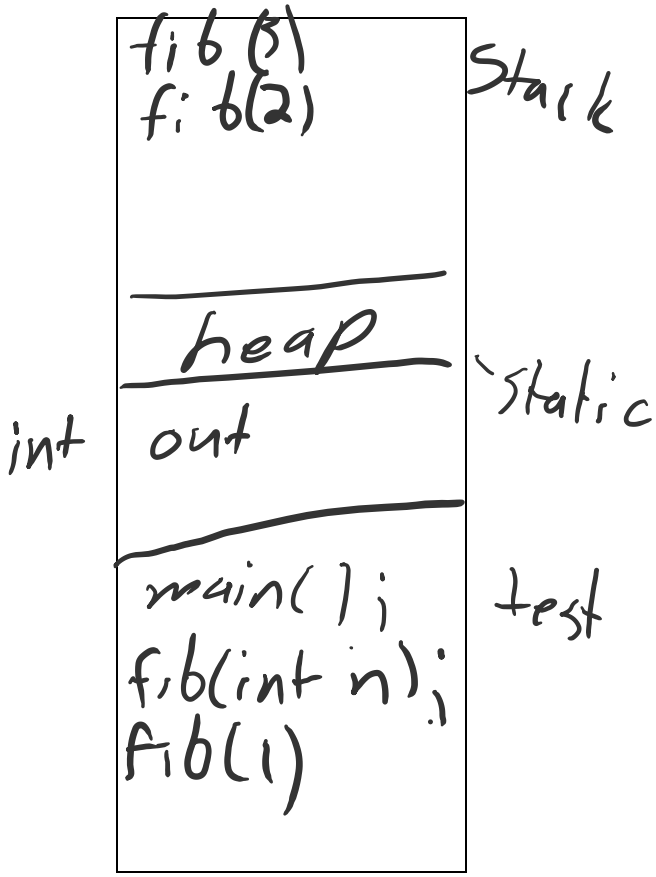
```
int main(){
    static int out;
    int x = 3;

    out = fib(x);

    out = 5;
    return 0;
}

int fib(int n){
    if(n<=1)
    {
        return 1;
    }
    else
    {
        return ( fib(n-1) + fib(n-2) );
    }
```

RAM



C++ Programming Assignments

3) Design a **class** that has an array of floating-point numbers.

   a. The **constructor** should accept an integer and dynamically allocate the array to hold that many numbers.
   b. The **destructor** should free the memory held by the array.

   In addition, there should be **member functions** to perform the following operations:

   c. Store a number in any element of the array
   d. Retrieve a number from any element of the array
   e. Return the highest value stored in the array
   f. Return the lowest value stored in the array

CODE

```
#include <iostream>
using namespace std;

class FloatArray {


private:
	int size;
	float farray[];



public:
	FloatArray() {
		size = 4;
		farray[0] = 0;
	}

	FloatArray(int it) {
		size = it;
		for (int i = 0; i < size; i++) {
			farray[i] = 0;
		}
	}
	~FloatArray() {
		delete[]farray;
	}

	float getLow() {
		float low = farray[0];
		for (int i = 0; i < size; i++) {
			if (farray[0] > farray[i]) {
				low = farray[i];
			}
		}
		return low;
	}
```

```
	float getHigh() {
		float hi = farray[0];

		for (int i = 0; i < size; i++) {
			if (farray[0] < farray[i]) { hi = farray[i]; }
		} return hi;
	}
	void setArraySize(int size) {
		farray[size];
	}
	void setValue(int index, float numb) {
		farray[index] = numb;
	}
	float getValue(int index) {
		return farray[index];
	}

};

int main() {
	FloatArray test(10);
	test.setValue(0,2);
	test.setValue(1, 3);
	test.setValue(2, 5);

	cout << "Get Value: " << test.getValue(2) << endl;
	cout << "Lowest: " << test.getLow() << endl;
	cout << "Highest: " << test.getHigh() << endl;
	return 0;
}
```