

Project 2

1 Thread

The screenshot shows the NetBeans IDE 8.1 interface. The top menu bar includes File, Edit, View, Navigate, Source, Refactor, Run, Debug, Profile, Team, Tools, Window, and Help. The toolbar contains icons for file operations, navigation, and execution. The left sidebar shows the Project, Files, Services, and Navigator views. The main editor window displays the source code of project2.c. The code defines NUM_ARRAY as 20000 and NUM_THREAD as 1. It includes a runner function and a runner_struct. The main function uses clock_t to measure execution time. The output window shows the results of the program execution, including thread calculations and a successful run message.

```
#define NUM_ARRAY 20000 /* number of elements (numbers) for the array */
#define NUM_THREAD 1 /* number of threads for the program */

int numbers[NUM_ARRAY]; /* array is shared by all threads */
int sum; /* stores the sum of all the elements in the array */
void *runner(void *param); /* threads call this function */
/* this struct stores variables that will be passed into the runner */
struct runner_struct{
    int *array; /* pointer to the numbers array */
    int id; /* for printing purposes, irrelevant to computation */
    int min; /* stores the minimum index for a thread to traverse */
    int max; /* stores the the maximum index for a thread to traverse */
    int sum; /* stores the thread's component of the array's total sum */
};

/*
 *
 */
int main(void) {
    clock_t t; /* used to measure the execution time */
    t = clock(); /* mark the current time */
```

amendoza123_CSC_341_01_C (Build, Run) × amendoza123_CSC_341_01_C (Run) ×

```
Thread 0, Element 19997: 11136 + 22 = 11158
Thread 0, Element 19998: 11158 + 3 = 11161
Thread 0, Element 19999: 11161 + -91 = 11070
sum = 11070, run time = 204.000000 milliseconds.
Have a nice day!

RUN SUCCESSFUL (total time: 3s)
```

Run successful.

5 Threads

amendoza123_CSC_341_01_C - NetBeans IDE 8.1

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help

Debug

project2.c

Source History

```

#define NUM_ARRAY 20000 /* number of elements (numbers) for the array */
#define NUM_THREAD 5 /* number of threads for the program */

int numbers[NUM_ARRAY]; /* array is shared by all threads */
int sum; /* stores the sum of all the elements in the array */
void *runner(void *param); /* threads call this function */
/* this struct stores variables that will be passed into the runner */
struct runner_struct{
    int *array; /* pointer to the numbers array */
    int id; /* for printing purposes, irrelevant to computation */
    int min; /* stores the minimum index for a thread to traverse */
    int max; /* stores the the maximum index for a thread to traverse */
    int sum; /* stores the thread's component of the array's total sum */
};

/*
 *
 */
int main(void) {
    clock_t t; /* used to measure the execution time */
    t = clock(); /* mark the current time */

```

Output

amendoza123_CSC_341_01_C (Build, Run) × amendoza123_CSC_341_01_C (Run) ×

```

Thread 4, Element 19997: 4000 + 22 = 4022
Thread 4, Element 19998: 4022 + 3 = 4025
Thread 4, Element 19999: 4025 + -91 = 3934
sum = 11070, run time = 187.000000 milliseconds.
Have a nice day!

RUN SUCCESSFUL (total time: 4s)

```

Run successful.

10 Threads

amendoza123_CSC_341_01_C - NetBeans IDE 8.1

File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help

Debug

project2.c

Source History

```

#define NUM_ARRAY 20000 /* number of elements (numbers) for the array */
#define NUM_THREAD 10 /* number of threads for the program */

int numbers[NUM_ARRAY]; /* array is shared by all threads */
int sum; /* stores the sum of all the elements in the array */
void *runner(void *param); /* threads call this function */
/* this struct stores variables that will be passed into the runner */
struct runner_struct{
    int *array; /* pointer to the numbers array */
    int id; /* for printing purposes, irrelevant to computation */
    int min; /* stores the minimum index for a thread to traverse */
    int max; /* stores the the maximum index for a thread to traverse */
    int sum; /* stores the thread's component of the array's total sum */
};

/*
 *
 */
int main(void) {
    clock_t t; /* used to measure the execution time */
    t = clock(); /* mark the current time */

```

Output

amendoza123_CSC_341_01_C (Build, Run) × amendoza123_CSC_341_01_C (Run) ×

```

Thread 9, Element 19997: 1259 + 22 = 1281
Thread 9, Element 19998: 1281 + 3 = 1284
Thread 9, Element 19999: 1284 + -91 = 1193
sum = 11070, run time = 186.000000 milliseconds.
Have a nice day!

RUN SUCCESSFUL (total time: 5s)

```

Run successful.