**CS403/503 Programming Languages  
Spring 2021**Assignment #4

Note: if it asks you to write a program, make sure the program compiles and executes.

1. Write a program in C that uses the qsort function to sort an array of real numbers (double). Paste below only the comparison function passed to qsort as a parameter.

Answer:

int compare (const void \*a, const void \*b) {

if (\*(double \*)a > \*(double \*)b) {

return 1;

}

else {

return -1;

}

}

1. Problem 5 of Chapter 9 on Page 413

Answer:

* Passed by value

The value and list always remain same

Value = 2

List = {1, 3, 5, 7, 9}

* Passed by reference
  + After first swap

Value = 1

List = {2, 3, 5, 7, 9}

* + After second swap

Value = 1

List = {3, 2, 5, 7, 9}

* + After third swap

Value = 2

List = {3, 1, 5, 7, 9}

* Passed by value-result
  + After first swap

Value = 1

List = {2, 3, 5, 7, 9}

* + After second swap

Value = 1

List = {3, 2, 5, 7, 9}

* + After third swap

Value = 2

List = {3, 1, 5, 7, 9}

1. Programming Exercise 8 of Chapter 9 on Page 415

Answer:

template <class Type>

int search(Type\* array, Type key, int size) {

for(int index = 0; index < size; index++) {

if(array[index]== key) {

return index;

}

}

return -1;

}

1. Problem 2 of Chapter 10 on Page 443

Answer:

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| --- | --- | --- |
| ARI for c | Parameter (plums) |  |
| Dynamic link |  |
| Static link |  |
| Return (to b) |  |
| ARI for b | Local (z) |  |
| Local (y) |  |
| Parameter (sum) |  |
| Dynamic link |  |
| Static link |  |
| Return (to a) |  |
| ARI for a | Local (x) |  |
| Dynamic link |  |
| Static link |  |
| Return (to bigsub) |  |
| ARI for bigsub | Local (l) |  |
| Local (mysum) |  |