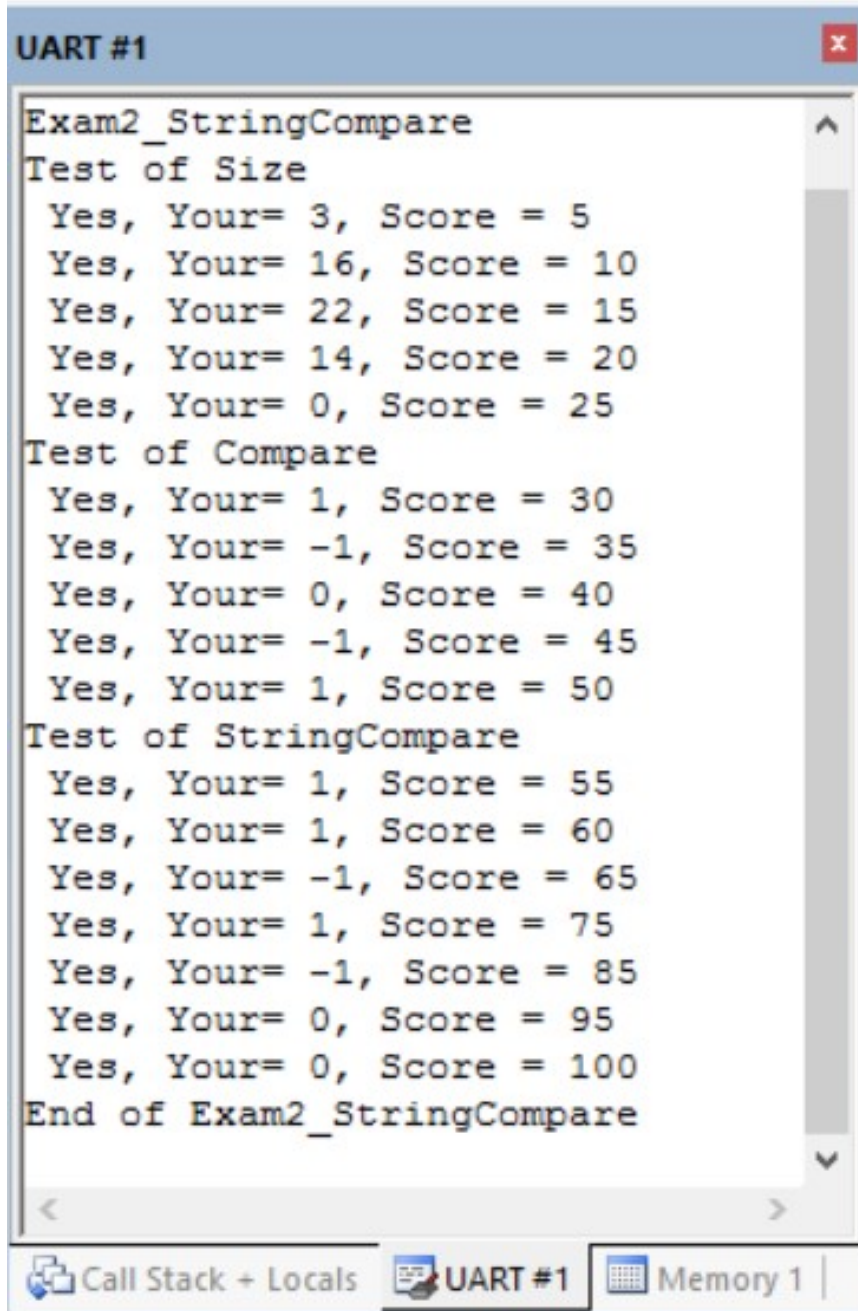


Dhruv Sandesara – Homework 8

Exam2_StringCompare

Time Taken – 26 minutes

Exam2_StringCompare UART#1 Screenshot



The screenshot shows a window titled "UART #1" with a red close button. The window contains the following text output from the program:

```
Exam2_StringCompare
Test of Size
Yes, Your= 3, Score = 5
Yes, Your= 16, Score = 10
Yes, Your= 22, Score = 15
Yes, Your= 14, Score = 20
Yes, Your= 0, Score = 25
Test of Compare
Yes, Your= 1, Score = 30
Yes, Your= -1, Score = 35
Yes, Your= 0, Score = 40
Yes, Your= -1, Score = 45
Yes, Your= 1, Score = 50
Test of StringCompare
Yes, Your= 1, Score = 55
Yes, Your= 1, Score = 60
Yes, Your= -1, Score = 65
Yes, Your= 1, Score = 75
Yes, Your= -1, Score = 85
Yes, Your= 0, Score = 95
Yes, Your= 0, Score = 100
End of Exam2_StringCompare
```

At the bottom of the window, there is a toolbar with three buttons: "Call Stack + Locals", "UART #1" (which is currently selected), and "Memory 1".

Exam2.c code

```
uint32_t Size(const uint8_t *buffer){  
int count = 0;  
while(*buffer != '\0'){  
count++;  
buffer++;  
}  
return(count);  
}
```

```
int32_t Compare(uint8_t first, uint8_t second){  
int result;  
if(first > second) result = -1;  
if(second > first) result = 1;  
if(first == second) result = 0;  
return result;  
}
```

```
int32_t StringCompare(const uint8_t *buffer1, const uint8_t *buffer2){  
char ch1 = *buffer1, ch2 = *buffer2;  
int result = 0;  
while((ch1 != '\0') || (ch2 != '\0')) && (result == 0) {  
if(ch1 > ch2) {result = -1;}  
if(ch2 > ch1) {result = 1;}  

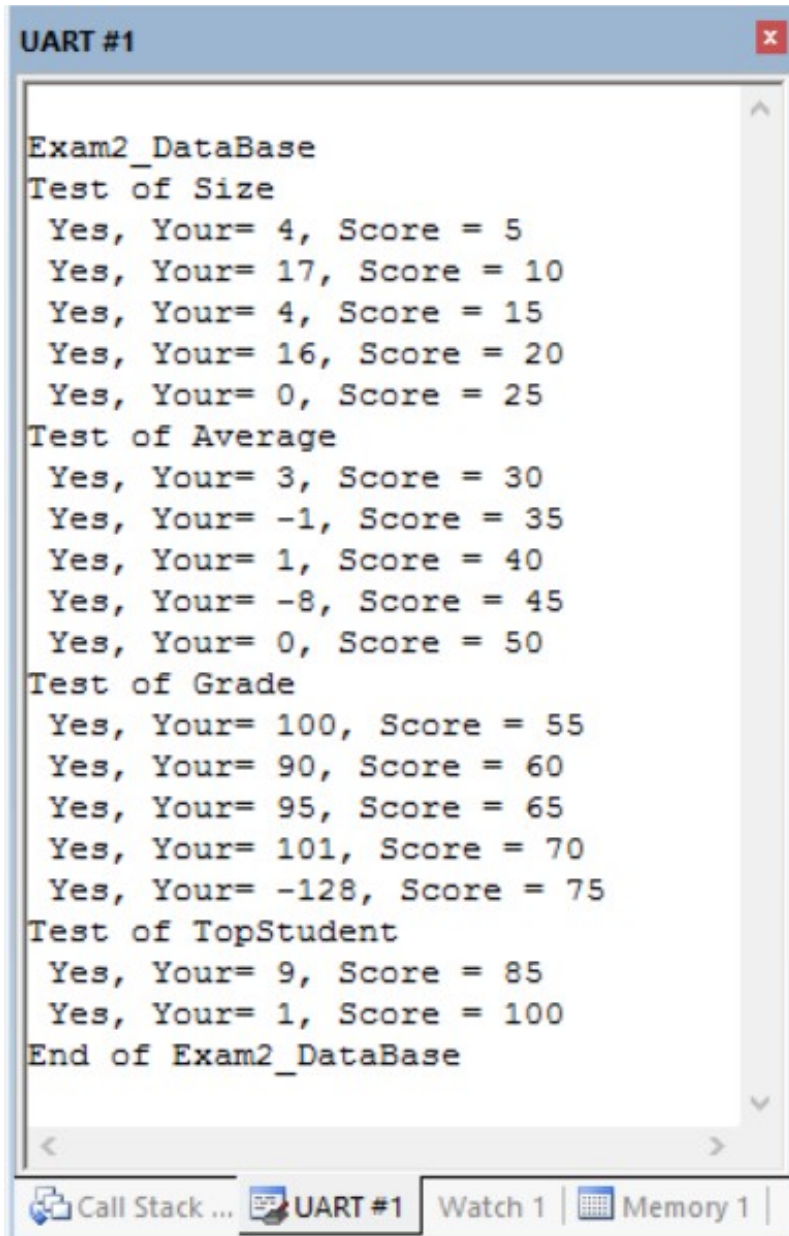
```

```
buffer1++;  
ch1 = *buffer1;  
buffer2++;  
ch2 = *buffer2;  
}  
return(result);  
}
```

Exam2_Database

Time Taken – 37 minutes

Exam2_DataBase UART#1 Screenshot



```
UART #1
Exam2_DataBase
Test of Size
  Yes, Your= 4, Score = 5
  Yes, Your= 17, Score = 10
  Yes, Your= 4, Score = 15
  Yes, Your= 16, Score = 20
  Yes, Your= 0, Score = 25
Test of Average
  Yes, Your= 3, Score = 30
  Yes, Your= -1, Score = 35
  Yes, Your= 1, Score = 40
  Yes, Your= -8, Score = 45
  Yes, Your= 0, Score = 50
Test of Grade
  Yes, Your= 100, Score = 55
  Yes, Your= 90, Score = 60
  Yes, Your= 95, Score = 65
  Yes, Your= 101, Score = 70
  Yes, Your= -128, Score = 75
Test of TopStudent
  Yes, Your= 9, Score = 85
  Yes, Your= 1, Score = 100
End of Exam2_DataBase
```

Exam2.c Code

```
uint32_t Size(const char *string){
    int count = 0;
    while(*string != '\0') {
        count++;
        string++;
    }
    return(count);
}

int8_t Average(uint32_t size, const int8_t *pt){
    int32_t avg = 0;
    int8_t neg;
    if(size == 0) return(0);
    for(int i = 0; i < size; i++){
        if((*pt & 0x80) == 0x00) avg += *pt;
        if((*pt & 0x80) == 0x80) {
            neg = *pt;
            neg ^= 0xFF;
            neg++;
            avg -= neg;
        }
        pt++;
    }
    if(avg < 0) {
```

```
    avg ^= 0xFFFFFFFF;
    avg++;
    avg/=size;
    avg ^= 0xFFFFFFFF;
    avg++;
}
else{
    avg /= size;
}
return(avg);
}
```

```
int8_t Grade(student_t s){
    int avg = 0;
    int count = 8;
    for(int i = 0; i < 8; i++){
        if(s.data[i] == -128) {
            count--;
        }
        else {
            avg += s.data[i];
        }
    }
    if(count == 0) return (-128);
```

```
    avg /= count;
    return(avg);
}
uint32_t TopStudent(const student_t EE319K[10]){
    int arr[10];
    int top;
    int count;
    for(int i = 0; i < 10; i++) {
        arr[i] = Grade(EE319K[i]);
    }
    top = arr[0];
    for(int j = 1; j < 10; j++) {
        if(arr[j] > top) {
            top = arr[j];
            count = j;
        }
    }
    return(count);
}
```