Lab Assignment 7

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CPSC1150 - Section 1

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Exercise Title: Arrays Lab

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**Program Arrays Lab**

File Name: Lab07.java

Purpose: To solve some problems using java arrays:

* + - Fill an array with random numbers.
    - Print out an array.
    - Reverse an array.
    - Print the sum of an array in an interesting way.
    - Fill an array with random numbers from a chosen min to a chosen max value.
    - Count the number of occurrences of a number in an array.
    - Create an array of characters from keyboard input.
    - Print out an array of characters, but replace spaces with newline characters.

Input: Will be done as the program runs, but currently the only input is a string to turn into an array of characters

Output: Various outputs:

* 10 digit array with random numbers from 1 – 10.
* The previous array reversed.
* The an array with numbers equal to the sum of the reversed array up to the counter/iterator
* 50 digit array with random numbers from 10 – 20
* The number of occurrences of each number in the previous array
* User inputted character array printed out so that spaces are replaces by newlines

Technical Information:

Compiler: Java SDK 1.7

Computer: Intel Celeron 2955U 1.4GHz, 2.00 GB of RAM

Language: Java

Source Code:

Attached

Program Logic (Pseudocode)

**reverseArray**

(definitions)

0.1 Input ← array passed to function

0.2 Output ← new array with same length as Input

0.3 Length(arr) ← length of an array

START

1. Count1 ← 0
2. Count2 ← length(input) – 1
3. While count2 >= 0
   1. Output[Count2] ← Input[Count1]
   2. Count1 ++
   3. Count2 –
4. Return Output

END

**sumArray**

(definitions)

* 1. Input ← array passed to function
  2. Input2 ← array passed to function (should be same length as Input, but full of 0’s)

START

1. For each number in Input (Count)
   1. Count2 ← 0
   2. For each number from 0 to Count (Count2)
      1. Sum += Input[Count2]
   3. Print Sum

END

**countArray**

(definitions)

0.1: Input ← Array passed to function

0.2: Number ← A single number in the input array

START

1. Min ← max int value (2^32 – 1)
2. Max ← min int value (-2^32)
3. Count ← 0
4. For each number in input
   1. If number < min
      1. Min ← Number
   2. If number > max
      1. Max ← Input
5. For number in range (Min, max)
   1. Count ← 0
   2. For item in Input
      1. If item equals number
         1. Count ++
   3. Print number and count

END

**printOneInLine**

(definitions)

0.1: Input ← Array passed to function

0.2: Item ← A single character in the input array

START

1. For each item in input
   1. If item equals ‘ ‘
      1. Print *newline*
   2. Else
      1. Print item

END

**Test Cases:**

FORMAT: *Italic text: User input*

(Test cases start on next page)

Test Case 1:

Initialized an array of length: 10 and filled it with random numbers from 1 to 10:

4

3

5

8

6

1

6

7

8

8

Array1 reversed:

8

8

7

6

1

6

8

5

3

4

The sum of Array1 reversed up to the digit in the loop:

8

16

23

29

30

36

44

49

52

56

Initialized an array of length: 50 and filled it with random numbers from 10 to 20:

The number of occurrences of 10 is: 5

The number of occurrences of 11 is: 5

The number of occurrences of 12 is: 5

The number of occurrences of 13 is: 6

The number of occurrences of 14 is: 3

The number of occurrences of 15 is: 3

The number of occurrences of 16 is: 4

The number of occurrences of 17 is: 6

The number of occurrences of 18 is: 3

The number of occurrences of 19 is: 1

The number of occurrences of 20 is: 9

Please enter a string to be put into an array: *ABC123 ZYX321*

Your array split based on spaces:

ABC123

ZYX321

Test Case 2:

Initialized an array of length: 10 and filled it with random numbers from 1 to 10:

6

3

8

1

2

10

2

7

6

3

Array1 reversed:

3

6

7

2

10

2

1

8

3

6

The sum of Array1 reversed up to the digit in the loop:

3

9

16

18

28

30

31

39

42

48

Initialized an array of length: 50 and filled it with random numbers from 10 to 20:

The number of occurrences of 10 is: 6

The number of occurrences of 11 is: 5

The number of occurrences of 12 is: 3

The number of occurrences of 13 is: 7

The number of occurrences of 14 is: 3

The number of occurrences of 15 is: 6

The number of occurrences of 16 is: 7

The number of occurrences of 17 is: 4

The number of occurrences of 18 is: 1

The number of occurrences of 19 is: 5

The number of occurrences of 20 is: 3

Please enter a string to be put into an array: *0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167*

*168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254*

*255*

Your array split based on spaces:

0

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

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80

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82

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84

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86

87

88

Test Case 3:

Initialized an array of length: 10 and filled it with random numbers from 1 to 10:

6

8

10

9

1

10

5

5

1

4

Array1 reversed:

4

1

5

5

10

1

9

10

8

6

The sum of Array1 reversed up to the digit in the loop:

4

5

10

15

25

26

35

45

53

59

Initialized an array of length: 50 and filled it with random numbers from 10 to 20:

The number of occurrences of 10 is: 2

The number of occurrences of 11 is: 4

The number of occurrences of 12 is: 6

The number of occurrences of 13 is: 4

The number of occurrences of 14 is: 8

The number of occurrences of 15 is: 0

The number of occurrences of 16 is: 5

The number of occurrences of 17 is: 5

The number of occurrences of 18 is: 10

The number of occurrences of 19 is: 4

The number of occurrences of 20 is: 2

Please enter a string to be put into an array: *10000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000011*

***NOTE: this number is 10^256 with the last 2 numbers replaced with 1’s. 10^256 is 10 with 256 0’s after it, making it a total of 257 characters. The last 1 should be cut off, but the 2nd last should be kept intact.***

Your array split based on spaces:

1000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000001