

C/C++ PROGRAMMING (IT116IU)

Final Lab Exam

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Due date: Please check on Blackboard

Instruction

Please follow the steps:

1. For each question, please make your code clean and make sure that your code is runnable.
2. Open the provided problem sets (.docx file). For each exercise, please capture screenshots of your work and then paste them into the problem sets (.docx file). **DO NOT** create a new answer file!
Please convert this .docx file to .pdf file
3. Submit these files (source code and problem set files) to Blackboard before the deadline.
4. There are a total of 7 Lab Assignments in this course. **3/7** Lab Assignments will be randomly selected to score (~10% of your final score).
5. The final lab exam will be 10% of your final score.

Lab Assignments

Question 1. (30 points)

One large chemical company pays its salespeople on a commission basis. The salespeople receive \$200 per week plus 9% of their gross sales for that week. For example, a salesperson who sells \$5000 worth of chemicals in a week receives \$200 plus 9% of \$5000:

$$200 + 5000 * 9/100 = 650 (\$)$$

Develop a program with functions that will input each salesperson's gross sales for last week and will calculate and display that sales person's earnings. Process one sales person's figures at a time. Here is a sample input/output dialog:

```
Enter sales in dollars ( -1 to end): 5000.00
Salary is: $650.00

Enter sales in dollars ( -1 to end ): 1234.56
Salary is: $311.11

Enter sales in dollars ( -1 to end ): 1088.89
Salary is: $298.00

Enter sales in dollars ( -1 to end ): -1
```

```

1  #include <stdio.h>
2  #include <stdbool.h>
3  int main (void)
4  {
5      float sales, comm, salary;
6      while(true)
7      {
8          printf("Enter sales in dollars (-1 to end): ");
9          scanf("%f", &sales);
10         if (sales == -1)
11         {
12             return 0;
13         }
14         comm = sales / 100 * 9;
15         salary = comm + 200;
16         printf("Salary is: %.2f\n", salary);
17     }
18     return 0;
19 }

```

Terminal Output:

```

Average: 31.000000
PS C:\Works\C C++\26-5> cd "c:\Works\C C++\26-5\" ; if ($?) { gcc 1.c -o 1 } ; if ($?) { .\1 }
Enter sales in dollars (-1 to end): 5000
Salary is: 690.00
Enter sales in dollars (-1 to end): 1234.56
Salary is: 311.11
Enter sales in dollars (-1 to end): 1088.89
Salary is: 298.00
Enter sales in dollars (-1 to end): -1
PS C:\Works\C C++\26-5>

```

Question 2. (30 points) Develop a program with a function using pointers to compute the sum and average of all elements stored in an array of n numbers.

Example:

Enter the number of elements

4

Enter the array elements

34

22

56

12

Sum = 124

Average = 31

```

1  #include <stdio.h>
2  int main (void)
3  {
4      int num, i, sum = 0;
5      printf("Enter the numbers of elements: \n");
6      scanf("%d", &num);
7
8      int arr[num];
9      int *parr = arr;
10     printf("Enter the array elements: \n");
11     for (i = 0; i < num; i++)
12     {
13         scanf("%d", parr + i);
14     }
15     for (i = 0; i < num; i++)
16     {
17         sum = sum + *(parr + i);
18     }
19     float avg = (float)sum / num;
20     printf("Sum: %d", sum);
21     printf("\nAverage: %f", avg);
22     return 0;
23 }

```

Terminal Output:

```

PS C:\Works\C C++\26-5> cd "c:\Works\C C++\26-5\" ; if ($?) { gcc 2.c -o 2 } ; if ($?) { .\2 }
Enter the numbers of elements:
4
Enter the array elements:
34
22
56
12
Sum: 124
Average: 31.000000
PS C:\Works\C C++\26-5>

```

Question 3. (40 points) Write a C program with 3 functions to implement string operations, including compare, concatenate, and string length. You are not allowed to use any libraries except stdio.h and string.h

Example:

```
1.String length
2.string comparision
3.string concatenation
4.quit
-----
enter your choice
1
enter string
HCMIU
the length of string= 6
-----
1.String length
2.string comparision
3.string concatenation
4.quit
enter your choice
2
enter string 1:
HCMIU
enter string 2:
HCMIU
strings are equal
-----
1.String length
2.string comparision
3.string concatenation
4.quit
enter your choice
2
enter string 1:
HCMIU
enter string 2:
ITIU
strings are NOT equal
-----
1.String length
2.string comparision
3.string concatenation
4.quit
enter your choice
3
enter string 1:
I love IU
enter string 2:
VNU-HCM
The Result: "I love IU VNU-HCM"
```

