

# COSC 501

## Lab 5

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### **(30 points) Program 1: Reading a user input character by character**

Write a C++ program that reads each character from a user input, extracts the character if it is a digit, and calculates the sum of all the digits. The program stops reading the user input when the new line character ‘\n’ is encountered. For the output of the program, you should print each digit extracted from the user input and the sum of all the digits.

(\*The main difference between “cin >> c” and “**cin.get(c)**” is that “cin >> c” skips the whitespace characters such as a tab (\t), blank, newline (\n). But “**cin.get(c)**” extracts every character including the whitespace characters.)

#### **What to use:**

- **cin.get(c)** // Extracts a single character from the standard input stream (cin)  
// c is a char type variable where the extracted value is stored.

- **ASCII Table**

int	char	int	char
48	‘0’	53	‘5’
49	‘1’	54	‘6’
50	‘2’	55	‘7’
51	‘3’	56	‘8’
52	‘4’	57	‘9’

#### **Sample Output:** Red colored texts are user inputs. Other texts are the output of the program.

Enter any texts: q1w2e3r4t5y6u7i8o9p0

1 2 3 4 5 6 7 8 9 0

Sum of all the digits is: 45

## ( 30 points) Program 2: Reversing a number

Write a C++ program that reverses a number. This program reverses the number entered by the user and then prints the reversed number on the screen. For example, if user enter 123 as input then 321 is printed as output.

Writing a function that reverses a number is recommended.

```
//Precondition: num is any integer number.  
//Postcondition: reversed number is returned.  
int reversingNumber(int num);
```

### **What To Use:**

- int%10 //returns the digit in ones place
- int/10 //used to move one digit to the right
- int\*10 //used to move one digit to the left

**Sample Output:** Red colored texts are user inputs. Other texts are the output of the program.

```
Enter the number: 1432  
Reverse the number 2341
```

## ( 40 points) Program 3: Grade Calculator

Write a C++ program that computes a student's grade based on the grading criteria below.

Grading		Grading Criteria	
		Grade	Percentage
Assignments	20%	A	90-100
Labs	20%	B	80-89
Midterm Exam	30%	C	70-79
Final Exam	30%	D	60-69
Total	100%	F	0-59

**Input:** Assignment score, Lab score, Midterm score, and Final score.

Test your program with the following input data.

Assignments	95 / 100
Labs	82 / 100
Midterm Exam	93 / 100
Final Exam	85 / 100

**Sample Output:** Red colored texts are user inputs. Other texts are the output of the program.

Enter your assignment score: 95

Enter your lab score: 82

Enter your midterm exam score: 93

Enter your final exam score: 85

Your total score is 88.8 and your grade is B.

### **Submission:**

You should submit your source files (.cpp). Please name your files to include the lab number and program number, e.g. Lab0Program1.cpp. Also create a word or pdf document for the answers to the lab questions and screenshots of running results.