Assignment 3 for Tutorials (Due Wednesday June 21 at 11:59pm) –

This assignment will focus on the FILE I/O and FUNCTIONS.

- In this assignment, you will need to upload your C++ file (file_name.cpp) to the Blackboard Drop Box.
- There are 4 different topics and each student will be assigned a question. **If you do not do the question that is assigned you will receive a mark of 0 for the entire assignment.**
- The assignment is worth 4% of your final grade and is marked out of 4.
- Your code must run on Visual Studio, **if we (The TA's) cannot run your code you will receive a mark of 0 for all sections but comments**.
- **Evidence of plagiarism and/or cheating will result in a mark of 0 for the assignment.**
- Your code needs to be documented with comments explaining what your code is doing. Improper/No documentation will result in loss of marks.
- You are not allowed to use arrays or features of C++ that are not covered in the course.
- You can use the Math Function.
- All calculations must be carried out in functions.
- Follow the instructions on each topic and deliver what is being asked.
- **The TA's will not be able to provide any assistance in the completion of this project other than clarification to the topics.**

Component	**Poor (0/3)**	**Acceptable (1/3)**	**Good (2/3)**	**Excellent (3/3)**	**Weight**	**Total**
Code Comments	No comments/Incorrect Comments (multiple)	Sparse Comments no errors/ Good comments a single error.	Sparse Comments with no errors	Highly readable and well explained comments	0.5	out of 0.5
FILE I/O	No use of File I/O – (code does not run)	Completes task without FILE I/O	Completes one of the tasks with one of FILE input or File output and other task is completed manually.	Assignment Tasks are completed with both FILE input and output	1	out of 1
Function (Use)	No Use of Function to complete calculations.	Use of function correctly but operation has a major error.	Use of function correctly but operation has a minor error.	Use of Function and correct operation	1	out of 1
Program Completeness	Incomplete Program (Does not run, incorrect assignment)	Program executes but does not perform as outlined by the assignment or has major errors.	Program executes but has only minor errors (too many variables) as outlined by the assignment.	Performs Flawlessly	1.5	out of 2

For Everyone-

assignment3.txt will have the following properties:

- The first line determines the number of entries, this will not be used in your calculations. Using this value in the core calculations will result in incorrect results.
- There will be values from 1 – 100. Only integer values.
- This text file will be common for all students even though there will be four separate topics.

Topic 1 –

Read from the file (assignment3.txt) that is attached on blackboard and calculate the volume of a sphere. The values that you are reading are in centimeters. After this done you will need to evaluate if the volume of the sphere is over 1.250 m^3 you will assign the value of the sphere as large. Others will be assigned a value of small. You will then need to write the properties to a text file. The output should resemble the table below. The volume needs to be output to 2 digits with units. The output file name will be volume.txt.

Number	Volume	Radius	Property
1	2.14m^3	0.80m	Large
2	0.14m^3	0.32m	Small

Topic 2 –

Read from the file (assignment3.txt) that is attached on blackboard and calculate the average of all the grades. The values that you are reading are percentage grades from 1 – 100. After this done you will need to say if the student passed (50 percent and higher). You will then need to write the properties to a text file. The output should resemble the table below (must include % in the output. You will need to print the average at the end of the list. And if the average is a pass/fail and the highest and smallest mark. The output file name is grades.txt.

Student	Grade	Pass/Fail
1	37%	Fail
2	63%	Pass

The average is 50%. The average is a pass. The highest mark was 63 and the lowest mark was 37.

Topic 3 –

Read from the file (assignment3.txt) that is attached on blackboard and identify if the numbers are prime or not. The values that you are reading are integers from 1 – 100. After this done you will need to say if the number is prime. Then you will sum the numbers that are not prime, and sum the numbers that are prime and compare if the total of primes is greater than non primes. The output file name will be primes.txt.

Prime	Number
Yes	97
No	4

The total value of primes is: 97. The total value of non-primes is: 4. The value of primes is larger than non-primes.

Topic 4 –

Read from the file (assignment3.txt) that is attached on blackboard and calculate the perimeter of the fence. The values that you are reading are integers from 1 – 100 in meters, you will need to read in pairs of values. After this done you will need to determine the number of fence posts you will need, the spacing of the posts is no more than 5m. You will then need to output the values into a table with in a text file named fence posts. The output filename will be fence.txt.

Fence	Length	Width	Perimeter	# Posts
1	10	5	30	6
2	2	3	6	4