

Mohawk College – Computer Engineering Technology

CENG 10003 – Programming

Homework 4

Pointers & Strings

Q1) Write a boolean function called `calculateBox()` that will calculate both the volume and surface area of a box with dimensions of length, width and height in units of cm. The function must accept the three input dimensions for the box and calculate both the volume and surface area using pointer variables. If any of the dimensions is less than or equal to 0 the function should return false through the use of the return statement. If the values are greater than 0 the function must return true. Write a main function that will prompt the user to enter the dimensions of the box and then call the function. If the function returns true then print both the Volume and Surface area of the box. If the function returns false, print an error message to the screen. The function prototype is given below:

```
bool calculateBox (double length, double width, double height, double  
*surfaceArea, double *volume);
```

Q2) Write a dice rolling game. The game should allow a user to toss up to six dice at a time. Each toss of a die will be stored in a six-element integer array. The array will be created in the `main()` function, but passed to a new function called `tossDie()`. The `tossDie()` function will take care of generating random numbers from one to six and assigning them to the appropriate array element number. After the dice are tossed, the `main()` function should display the generated values of the dice.

Q3) Write a program that performs the following operations:

- Uses character arrays to read a user's name from the keyboard
- Tells the user how many characters are in his/her name
- Displays the user's name in uppercase

Q4) Write a program that uses an array of strings to store the following Canadian province names:

- "Ontario"
- "Quebec"
- "Manitoba"
- "Alberta"
- "British Colombia"
- "Nova Scotia"

Using the preceding array of strings, write your own `sort()` function to display each province's name in alphabetical order using the `strcmp()` function.

Prepare a single word document with the full source code and screenshots for all programs. Submit the document to the dropbox on eLearn before the deadline.