**CSE1502 – Intro to Software Dev. with C++**

**Software Development Lab Report**

**Fall 2021**

*By*

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Homework or Lab #3

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# 1. Problem Statement

*Problem 1: The Program instructs the user to guess a number between 1 and 500. If the guessed number is too low, it will tell the user that the guess was too low. If the guessed number is higher than the correct one, it will tell the user that the guess is too high. This continues until the user guesses correctly or runs out of guesses.*

*Problem 2: The program displays a menu of options for SI Unit conversions between units of temperature and units of length.*

# 2. Requirements

*This section lists the functional requirements given for the software. Functional requirements dictate what the software needs to do (i.e., that major functions of the software). Each requirement must be presented using a numbered list. In addition, each requirement must specify one (and only one) function of the system, it must be attainable and verifiable.*

*Problem 1:*

1. *The software shall display a message upon being run*
2. *The software shall prompt for user input*
3. *The software shall compare user input to a predetermined value*
4. *The software shall execute situational code blocks depending on the conditional relation of the user input and the predetermined value.*
5. *The software shall increment a certain value*
6. *The software shall repeat from step 2 until a certain value is incremented to a certain amount.*

*Problem 2:*

1. *The software shall display a menu to receive user input.*
   1. *The user menu shall contain the options for unit conversions.*
   2. *The user menu shall display an option to terminate the program.*
2. *The software shall save the user input.*
   1. *The software shall enter the appropriate conversion.*
3. *The software shall prompt for user input.*
4. *The software shall save user input.*
   1. *The software shall calculate using user input.*
5. *The software shall display the resulting value.*
6. *The software shall repeat requirement 1.*

# 3. Software Construction (C++ Code)

*This section includes the software implementation of the design provided in section 3—it includes annotated explanations of well-formatted and commented C++ code. Students shall follow coding guidelines (given by Faculty/TA) to ensure high-quality software. Example is presented below.*

*Problem 1:*

#include <iostream>

#include <string>

using namespace std;

//Main Program

int main() {

//Declare Variables

string yourInput;

int guess, guesses, answer;

guess = 0;

guesses = 5;

answer = 150;

//Operations

cout << "Welcome to Guessing Game!" << endl;

cout << "Please guess a number from 1 to 500:" << endl;

cin >> guess;

//Loop

for (int g = (guesses - 1); g > 0; g--) {

if (guess < answer && guess > 0) {

cout << "That's too low! (" << g << " guesses left.)" << endl;

}

else if (guess == answer) {

cout << "You got it! Good Job" << endl;

break;

}

else if (guess > answer && guess <= 500) {

cout << "That's too high! (" << g << " guesses left.)" << endl;

}

else {

g++;

cout << "Invalid input. (" << g << " guesses left.)" << endl;

}

cin >> guess;

}

//If lost

if (guess != answer) {

cout << "You lost! Better luck next time." << endl;

}

}

*Problem 2:*

#include <iostream>

#include <string>

#include <cmath>

using namespace std;

int main() {

//Declare Variables

int x;

float fahrenheit;

float kelvin;

float meters;

float yards;

//Single-Time Output

cout << "Welcome to Converter!" << endl;

do {

//Menu Output, Take Input

cout << "Please select from the following conversions." << endl;

cout << "(1) Fahrenheit to Kelvin" << endl;

cout << "(2) Kelvin to Farenheit" << endl;

cout << "(3) Meters to Yards" << endl;

cout << "(4) Yards to Meters" << endl;

cout << "(5) Exit" << endl;

cin >> x;

//Logic

if (x == 1) {

cout << "Fahrenheit to Kelvin- \nEnter a temperature in Fahrenheit." << endl;

cin >> fahrenheit;

cout << fahrenheit << " degrees Fahrenheit is " << ((fahrenheit - 32) / 1.8 + 273.15) << " degrees Kelvin.\n\n";

}

else if (x == 2) {

cout << "Kelvin to Fahrenheit- \nEnter a temperature in Kelvin." << endl;

cin >> kelvin;

cout << kelvin << " degrees Kelvin is " << ((kelvin - 273.15) \* 1.8 + 32) << " degrees Fahrenheight.\n\n";

}

else if (x == 3) {

cout << "Meters to Yards- \nEnter a measurment in meters." << endl;

cin >> meters;

cout << meters << " meters is " << (meters \* 1.094) << " yards.\n\n";

}

else if (x == 4) {

cout << "Yards to Meters- \nEnter a measurment in yards." << endl;

cin >> yards;

cout << yards << " yards is " << (yards / 1.094) << " meters.\n\n";

}

else if (x == 5) {

cout << "Terminating Program...\n\n";

break;

}

else {

cout << "Invalid selection.\n\n";

}

} while (true);

}

# 4. Software Testing

*This section provides information and test cases that are used to verify that all requirements identified in section 1are achieved by the software. Sample screenshots shall be included here.*

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# 5. Self-Reflection

*This section provides information about what the student learned, what challenges were encountered, and what the student did to overcome the challenges and complete the lab. Please make sure that you document any other information that was helpful to you during this assignment.*

(*Note: In case of multiple problems, repeat steps1-5 above for each problem.*)

Problem 1: I didn’t really learn anything, and didn’t have any challenges making this program.

Problem 2: I learned that “else” statements are very good for invalid inputs.

Conclusion: I knew how to do the code, and so neither problem was difficult. The in-class examples and slideshows helped, but mostly I am calling on experience from practical applications in robotics club.