Assignment 3

Due Wednesday June 22, 2011 by 11:59pm

- Submit all the deliverables to the Course Management System: <u>https://courses.cs.sfu.ca/</u>
- There is no possibility of turning the assignment in late.
- The solution will be posted soon after it is due in preparation for the midterm.

This assignment is to be done individually. Do not show another student your code, do not copy code found online, and do not post questions about the assignment online. Please direct all questions to the instructor or TA:

- For CMPT125, email <u>cmpt-125-d2-help@sfu.ca;</u>
- For CMPT128, email <u>cmpt-128-help@sfu.ca</u>.
- See the marking guide for details on how each part will be marked.

1. Temperature Scale

Write the program temperatureScale.cpp that creates a table of temperature conversions.

- The program must ask the user for:
 - Minimum and maximum temperatures (Celsius) for the table (read in on one line).
 - Step size for the table (degrees Celsius).
- You do not need to do any error checking on the user's input; assume he/she correctly enter numbers, and that the numbers are fine. For example, you do not have to check if the maximum temperature is less than the minimum temperature, or if the step-size is negative.
- **Using a for loop**, print to the screen a table featuring:
 - Temperature in degrees Celsius (to 1 decimal place)
 - Temperature in degrees Fahrenheit (to 1 decimal place). Formula is: Degrees Fahrenheit = Degrees Celsius * (9 / 5) + 32
 - Description of the temperature ("feels like..."), as per the following table:

Temperature (degrees Celsius)	Descriptive Text
Less than -15'C	VERY cold
Greater than or equal -15'C but less than 5'C	Cold
Greater than or equal 5'C but less than 25'C	Warm
Greater than or equal 25'C but less than 35'C	Hot
Greater than or equal 35'C	VERY hot

- The table must be nicely formatted using the cout formatting manipulators (in iomanip).
 - It is OK if the table does not display the row for the maximum temperature if the maximum is not equal to the minimum plus a multiple of the step size.
 - For example, if the user enters the range 0 to 15 and the step size 10, then it is OK if your program only prints out rows for 0 and 10 (and not 20). You may choose to make your program output the row for 20 in this case if you like.

Code Style:

- Use named constants appropriately: do not use any magic numbers.
- Indent and format your code correctly.
- Comment your code.

Sample Outputs: User input bold and underlined.

```
What temperature range would you like to display?
Enter minimum and maximum separated by a space: -20 50
Enter the steps between values: 10
My very own Celsius to Fahrenheit conversions:
  Celsius Fahrenheit Feels like
  ----- ----- ------
                -4.0 VERY cold
    -20.0
              14.0 Cold
32.0 Cold
   -10.0
0.0
10.0
               50.0 Warm
               68.0 Warm
     20.0
             86.0 Hot
104.0 VERY hot
122.0 VERY hot
     30.0
     40.0
     50.0
```

What tempera Enter minimu Enter the st	ature range um and maxim ceps betweer	would you like to display? mum separated by a space: <u>5</u> <u>10</u> n values: <u>0.5</u>	
My very own	Celsius to	Fahrenheit conversions:	
Celsius H	Fahrenheit	Feels like	
5.0	41.0	Warm	
5.5	41.9	Warm	
6.0	42.8	Warm	
6.5	43.7	Warm	
7.0	44.6	Warm	
7.5	45.5	Warm	
8.0	46.4	Warm	
8.5	47.3	Warm	
9.0	48 2	Warm	
9.0 9.5	10.2 49 1	Warm	
J.J	49.1 E0 0		
T0.0	50.0	Walin	

```
What temperature range would you like to display?

Enter minimum and maximum separated by a space: <u>30.0 45.0</u>

Enter the steps between values: <u>10</u>

My very own Celsius to Fahrenheit conversions:

Celsius Fahrenheit Feels like

<u>30.0 86.0 Hot</u>

40.0 104.0 VERY hot
```

2. Dice Game: Beat The Roll

Write a program named beatTheRoll.cpp which plays the Beat The Roll dice game described below. Note that this game is not a standard game; it was created just for this assignment.

Game Description:

- There is only one player (the user), plus the dealer (the computer).
- The player starts with 100 points. When they reach 200 points they win, but if they drop to 0 points they lose.
- Each round starts with the dealer rolling two dice (and adds them together). The player can see the roll.
- The player then bets a certain number of points.
- The player then rolls two dice (and adds them together).
 - If the player beats the dealer (player's sum is greater than dealer's sum), then the player wins as many points as he or she bet.
 - If the player ties the dealer (player's sum equals the dealer's sum), then no points are won or lost.
 - If the dealer beats the player (player's sum is less than dealer's sum), then the player loses as many points as he or she bet.
- The game continues until the player wins (has 200 or more points) or loses (has 0 points).

Program Description:

- First the program asks the user what the betting limit will be for this game. Must be greater than or equal to 1.
 - This is just the maximum number of points the user will be allowed to bet. For example, the user could choose a low limit like 10, or a high limit like 100 or 200. There is no upper limit.
 - In "reality", this limit would likely be imposed by the cassino.
- Ask the user his or her name (may be multiple words).
- Then the user starts playing rounds of the game (as described above) until he or she wins (>=200 points) or loses (<=0 points):</p>
 - All rolls are done by using pseudo-random numbers. You must randomize by the timer (seed with the timer) to make the game different each time it is played. Note that you should only seed once: only have one call to srand(). That is sufficient to give good pseudo-random numbers when using rand().
 - When betting, ensure that the user's bet is:
 - at least the minimum bet of 1 point;
 - no more than the maximum bet (entered by the user at the start of the program);
 - no more than the user's current number of points.
 - Determine if the user wins each round, and award (or subtract) points from the user if they win (or lose). Only track the store of the user; do not track the score of the dealer.
- When the user wins or loses the game (>=200 points or <=0 points), display an appropriate message and end the game.</p>

- As always, your code must have good style: meaningful comments and use named constant.
 - Note that often you won't need named constants for 0 or 1; however, for this program the minimum bet (1), and the losing score (0) should be named constants because someone might very well want to change those values in the future.
- Sample Winning Output:

```
*****
Welcome to Lucky's house of dice!
What would you like the maximum bet to be? :0
The maximum bet must be greater than 1.
What would you like the maximum bet to be? :-10
The maximum bet must be greater than 1.
What would you like the maximum bet to be? :100
What is your name? : I.L.B. Bach
Round 1 You have 100 points.
Dealer roll: 6 + 5 = 11 Enter your bet: \underline{0}
I.L.B. Bach, your bet must be at least 1.
Enter your bet: <u>-20</u>
I.L.B. Bach, your bet must be at least 1.
Enter your bet: <u>1</u>
I.L.B. Bach rolls: 2 + 6 = 8.
You lost.
Current score: 99.
Round 2 You have 99 points.
Dealer roll: 1 + 3 = 4 Enter your bet: <u>100</u>
I.L.B. Bach, your bet must not be more than your score (99).
Enter your bet: 99
I.L.B. Bach rolls: 5 + 5 = 10.
You won!
Current score: 198.
Round 3 You have 198 points.
Dealer roll: 2 + 2 = 4 Enter your bet: <u>150</u>
I.L.B. Bach, your bet must not be more than the maximum bet (100).
Enter your bet: 50
I.L.B. Bach rolls: 1 + 1 = 2.
You lost.
Current score: 148.
Round 4 You have 148 points.
Dealer roll: 3 + 3 = 6 Enter your bet: 60
I.L.B. Bach rolls: 2 + 6 = 8.
You won!
Current score: 208.
Congratulations I.L.B. Bach! You win with a score of 208!
```

Sample Losing Output:

3. Deliverables

Submit the items listed below to the Course Management System: https://courses.cs.sfu.ca/

- 1. temperatureScale.cpp
- 2. beatTheRoll.cpp

Each of your .cpp files must begin with a comment stating your name, your SFU user ID, and your SFU student number.

Please remember that all submissions will automatically be compared for unexplainable similarities. We will also be comparing assignments against what we can find on the internet. Please review the notes from lecture on the expectations for academic honesty.