System Manual:-

/
****
PROGRAM : Blood_Alcochol_Concentration_Chart_creator.cpp
Coder : Mosfiqur Rahman (mr986@drexel.edu)
Last Modified : 16th Febrruary, 2016.
**********/
Program Purpose:
This program will create a nice BAC [Blood Alcohol Concentration] Chart for both Male and Female persons, which is
strongly correlated with driving impairment. For this reason, the program will take two integer values, [one for
getting the weight of the user, another for having the time(in minutes) since the user had his/her last drink], and a character
value [for getting the information, whether the user is 'M' for male or 'F' for female.] as inputs. After giving all these
information properly as inputs, the program will show a whole detailed BAC chart [for that particular inputs.] as an output.

includes:
iostream
iostream
namespaces:
std
functions:
int main
void computeBloodAlcoholConcentration(int numDrinks, int weight, int duration, double &maleBAC, double &femaleBAC);

string impairment(double bac);

int promptForInteger(string const &message, int lower, int upper);

char promptForMorF(string const &message);

void showImpairmentChart(int weight, int duration, bool isMale);

global constants:
const double safe = 0.00;

const double someImpairment = 0.04;

const double significantAffected = 0.08;

const double someCriminalPenalties = 0.10;

```
const double deathPossible = 0.30;

const string SAFE = "Safe To Drive";

const string SOMEIMPAIR = "Some Impairment";

const string SIGNIFICANT = "Driving Skills Significantly Affected";

const string MOST_STATES = "Criminal Penalties in Most US States";

const string ALL_STATES = "Legally Intoxicated - Criminal Penalties in All US States";

const string YOURE_DEAD = "Death is Possible!";
```

int Main() function:

1.decleares two long integer variable to store the value of the time [since the user had his/her last drink] and the weight of the user
2.declears a character variable to store the gender of the user as either 'M' for males, and 'F' for females
3.decleares a bool variable, which will store particular value based on the gender of the user
The main function calls the

1. promptForInteger

Calls the promptForInteger function, passes the reference message, and the value for the variable lower and upper. Stores the value in the variable victim_weight, which is calculated by the promptForInteger function with the passed value

2. promptForInteger

Calls the promptForInteger function, passes the reference message, and the value for the variable lower and upper. Stores the value in the variable drink_duration, which is calculated by the promptForInteger function with the passed value

3. promptForMorF

Calls the promptForMorF function, passes the reference message. Stores the value in the variable gender, which is calculated by the promptForInteger function with the passed value.

Next:
1.Checks whether the value of the variable gender is 'M' or not
If it's so then continues,and initializes the value for the bool varible isMale or moves to other conditional statement
2.If the previous 'if' statement fails, then the program runs through this statement, and initializes the value for the bool varible isMale

4. showImpairmentChart

Calls the showImpairmentChart function, and passes the value of weight, duration, and isMale through the variables victim_weight, drink_duration, isMale respectively

void computeBloodAlcoholConcentration(int numDrinks, int weight, int duration, double &maleBAC, double &femaleBAC) function:

/***
This function will compute the BAC [Blood Alcohol Concentration] for both males, and females.
@param numdrinks - Number of drinks taken by the user.
@param weight - Weight [in pounds] of the user
@param duration - Time [in minutes] since the user had his/her last drink
@param &maleBAC - The value of BAC [Blood Alcohol Concentration] of a male person
@param &femaleBAC - The value of BAC [Blood Alcohol Concentration] of a female person

***/

1.Decleares and initializes a constant double variable for MALE_CONSTANT
2.Decleares and initializes a constant double variable for FEMALE_CONSTANT
3.Calculates the BAC for a male person through the following algorithm
Step: 1- First multiplying the value of MALE_CONSTANT with the value of [number of drinks / the weight of the user]
Step: 2- Then subtracting the value of [(.01 / 40) * duration since the user had his last drink] from the previous value to get the final value
4. Checks whether the final value of maleBAC is less than 0 or not
If it's so then continues,and initializes the value of maleBAC to 0 or moves to other conditional statement.
5.Calculates the BAC for a female person through the following algorithm
Step: 1- First multiplying the value of MALE_CONSTANT with the value of [number of drinks / the weight of the user]
Step: 2- Then subtracting the value of [(.01 / 40) * duration since the user had his last drink] from the previous value to get the final value
6.Checks whether the final value of maleBAC is less than 0 or not
If it's so then continues,and initializes the value of maleBAC to 0 or moves to other conditional statement.

string impairment(double bac) function:

/***
This function will return different driving impairments in strings under different values of BAC.
@param bac - The value of BAC [Blood Alcohol Concentration] of the user
@return bac_condition_brief - Driving Impairments in a string under the certain value of BAC of the user

***/
1. Decleares a string variable bac_condition_brief to store the Driving Impairments
2. Checks whether the value of bac is equal to the value of any significant global constant string. If one doesn't work, then moves to other conditional statement.
3. At last, returns the value of the variable bac_condition_brief

int promptForInteger(string const &message, int lower, int upper) function:

/***
This function will be used to prompt a passed message, and to get the weight and the time[since the user had his/her last drink] as inputs
@param &message - Message to be prompted
@param lower - Lower limit of the integer input
@param upper - Upper Limit of the integer input
@return integer - The final value of the given input as an integer

***/

1.Decleares a integer type variable to store the integer input from the user
2.Runs a do-while loop to ask the user for a valid integer input. The loop runs repeatedly untill it gets a perfect[i.e. if integer variable != (integer >= lower && integer <= upper)]

char promptForMorF(string const &message) function:

/***
This function will be used prompt a passed message, and to get the gender['M' for male or 'F' for female] of the user.
@param &message - Message to be prompted
@return gender - The final value of the user's gender [i.e. 'M' for male or 'F' for female]

***/

1.Decleares a character variable gender to store the information whether the user isMale as 'M' or Female as 'F'
2.Runs a do-while loop to ask the user for a valid integer input. The loop runs repeatedly untill it gets a perfect[i.e. if gender != (gender == 'M' || gender == 'F')]

void showImpairmentChart(int weight, int duration, bool isMale) function:

/***
This function will generate the final output[i.e. the entire BAC chart] calling
the computeBloodAlcoholConcentration(int numDrinks, int weight, int duration, double &maleBAC, double &femaleBAC) and impairment(double bac) function in it
@param weight - Weight [in pounds] of the user
@param duration - Time [in minutes] since the user had his/her last drink
@param isMale - Particular value based on the gender of the user.[To be more exact- if male isMale = 1, otherwise, isMale = 0]

***/

1.Decleares an integer variable to store the number of drinks taken by the user under some time constraint

2.Decleares a string variable to store the gender of the user in whole words with special output format
3.Checking whether the value of the variable isMale is '1' or not. If it's so then continues,and initializes the string value of gender or moves to other conditional statement.
4.At last, Runs a for loop to print the rest of the parts of the BAC [Blood Alcohol Concentration] Chart
5. Inside the loop, it calls the computeBloodAlcoholConcentration function to compute the and generalize the BAC value and also calls the impairment function
6.Finally, Produces formatted output to show the number of drinks and the BAC status for those different number of drinks on the same line.