

Prakhar Saxena

Professor Mark Boady

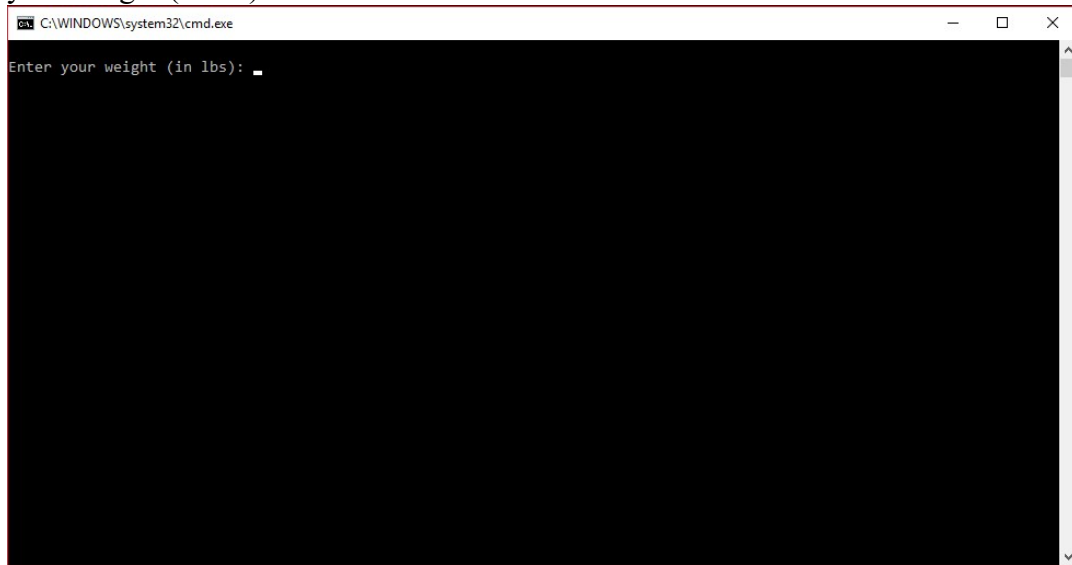
CS 171

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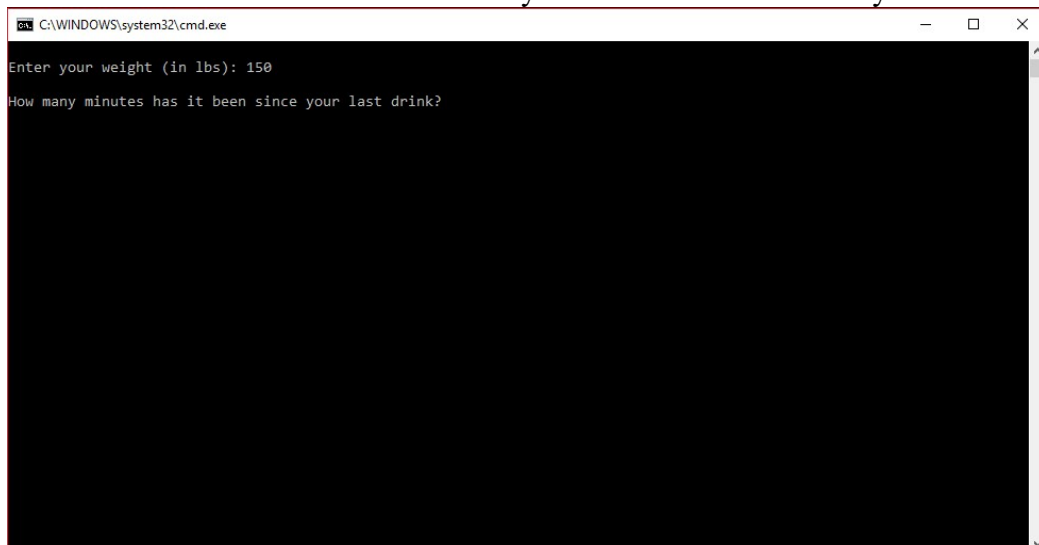
Blood Alcohol Concentration

❖ User Manual

- As soon as one compiles and runs the program, the first line to be seen would be: “Enter your weight (in lbs):”

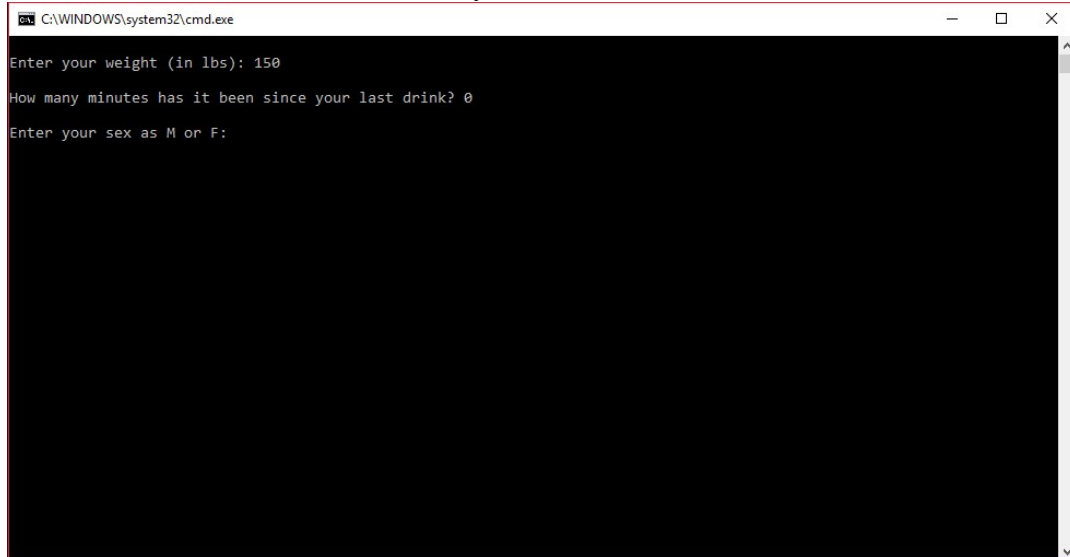


- The user is expected to enter the corresponding value, with the following conditions.
 - The value shouldn't be negative.
 - The value shouldn't exceed 1230.
- On failing to enter the values under the conditions, the program would again ask you to enter the value. It will repeat until an acceptable value is entered.
- Then the next line would be: “How many minutes has it been since your last drink?”



- The user is expected to enter the corresponding value, with the following conditions.
 - The value shouldn't be negative.
 - The value shouldn't exceed 1000.
- On failing to enter the values under the conditions, the program would again ask you to enter the value. It will repeat until an acceptable value is entered.

➤ Then the next line would be: "Enter your sex as M or F:"

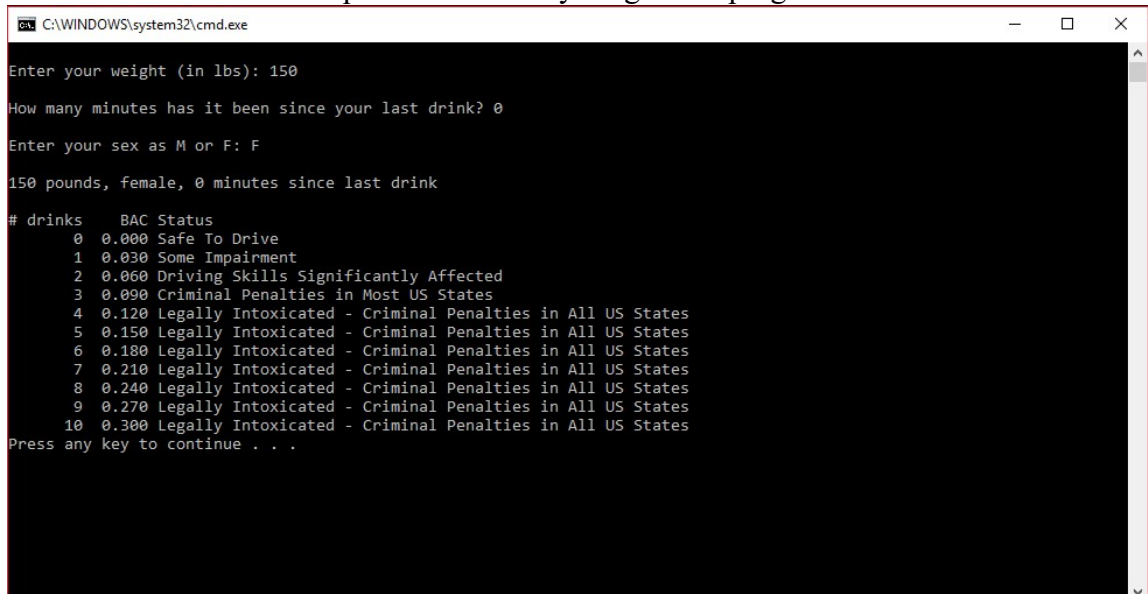


```

C:\WINDOWS\system32\cmd.exe
Enter your weight (in lbs): 150
How many minutes has it been since your last drink? 0
Enter your sex as M or F:
  
```

- The user is expected to enter the corresponding value, with the following conditions.
 - The values must be either of the following values:
 - ◆ 'M'
 - ◆ 'm'
 - ◆ 'F'
 - ◆ 'f'
- On failing to enter the values under the conditions, the program would again ask you to enter the value. It will repeat until an acceptable value is entered.

➤ The user then won't be required to enter anything in the program.



```

C:\WINDOWS\system32\cmd.exe
Enter your weight (in lbs): 150
How many minutes has it been since your last drink? 0
Enter your sex as M or F: F
150 pounds, female, 0 minutes since last drink

# drinks    BAC Status
0 0.000 Safe To Drive
1 0.030 Some Impairment
2 0.060 Driving Skills Significantly Affected
3 0.090 Criminal Penalties in Most US States
4 0.120 Legally Intoxicated - Criminal Penalties in All US States
5 0.150 Legally Intoxicated - Criminal Penalties in All US States
6 0.180 Legally Intoxicated - Criminal Penalties in All US States
7 0.210 Legally Intoxicated - Criminal Penalties in All US States
8 0.240 Legally Intoxicated - Criminal Penalties in All US States
9 0.270 Legally Intoxicated - Criminal Penalties in All US States
10 0.300 Legally Intoxicated - Criminal Penalties in All US States
Press any key to continue . . .
  
```

- The program would print out the user's weight, sex, duration since last drink.
- Then the program would print out # drinks, BAC, and Status in an orderly tabular fashion.

❖ System Manual

- There are 5 functions that I defined, and a main (as usual); In addition to those there are a few constants I used.
- Here is the list of Constants used:
 - `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!";`
- The first function created is **computeBloodAlcoholConcentration()**:
 - It is a void function, i.e. it returns nothing.
 - It takes 5 arguments in total. 3 integer type and 2 double.
 - First parameter is for Number of Drinks; integer type.
 - Second parameter is for weight; integer type.
 - Third parameter is for duration; integer type.
 - Fourth parameter is for male BAC; double type; reference variable.
 - Fifth is for female BAC; double type; reference variable.
 - There is no new variable declared/defined within the function.
 - The function simply calculates the male BAC and female BAC using the following operations:
 - `maleBAC = ((static_cast <double>(numDrinks) / static_cast <double>(weight))* 3.8) - (static_cast <double>(duration)* 0.01);`
 - `femaleBAC = ((static_cast <double>(numDrinks) / static_cast <double>(weight))* 4.5) - (static_cast <double>(duration)* 0.01);`
 - If the maleBAC or femaleBAC comes out to be negative, the function automatically assigns 0 to those variables.

- The next function created is **impairment()**:
 - It returns a string data type value.
 - It takes an double data type value as an argument. This argument is for the Blood Alcohol Concentration.
 - There is no new variable declared/defined within the function.
 - The only function used in this function is if-else-if to check the value of bac and return string values accordingly:

BAC	0.00	0.00-0.04	0.04-0.08	0.08-0.10	≥0.10	>0.30
Description	Safe to Drive	Some Impairment	Driving Skills Significantly Affected	Criminal Penalties in Most US States	Legally Intoxicated – Criminal Penalties in All US States	Death is Possible

- The next function created is **promptForInteger()**:
 - It returns a integer data type value.
 - It takes 3 arguments, 1 string and 2 integer data type.
 - The String type is the message it will print out in a loop.
 - The other 2 parameters are for checking the condition of the loop.
 - There is just one variable declared, checkvar. Used for taking input from the user.
 - There is one do-while loop in the function
 - Condition of the loop is that if the integer is Not greater than or equal to lower and not less than or equal to upper.
 - It returns the integer if the condition is false.
- The next function created is **promptForMorF()**:
 - It returns a character data type value.
 - It takes just one string type argument.
 - The string type is the message.
 - It checks if the input value form the user is either 'f', 'F', 'M' or 'm'.
 - If it is not it calls the function again (recursion).
- The next function created is **showImpairmentChart()**:
 - It is a void function, i.e. it doesn't return anything.
 - It takes 3 arguments, 2 integer and 1 Boolean data type.
 - One integer variable is for weight, the other is for duration.
 - The Boolean argument is for the sex of the user, if the user is male the value should be true; if female then it should be false.
 - This function essentially calls the function computeBloodAlcoholConcentration() inside a loop.
- The next thing is **main()**:
 - There are several variables in main, just to pass them as argument in the corresponding functions
 - The following is the list of the variables defined:
 - bac: double type; for assigning the Blood Alcohol Concentration
 - mbac: double type; male BAC
 - fbac: double type; female BAC

- stat: string type; Status to print out
- sexop: string type; sex to print out
- isMale: Boolean type; true if sex is male false if female
- weight: integer type; uses the function promptForInteger() for assignment.
- duration: integer type; uses the function promptForInteger() for assignment.
- sex: character type; uses the function promptForMorF() for assignment
- Ultimately the function showImpairmentChart() is called, weight, duration and isMale are the arguments passed.

❖ Test Log

```

C:\WINDOWS\system32\cmd.exe

Enter your weight (in lbs): 150
How many minutes has it been since your last drink? 0
Enter your sex as M or F: F
150 pounds, female, 0 minutes since last drink

# drinks    BAC Status
0 0.000 Safe To Drive
1 0.030 Some Impairment
2 0.060 Driving Skills Significantly Affected
3 0.090 Criminal Penalties in Most US States
4 0.120 Legally Intoxicated - Criminal Penalties in All US States
5 0.150 Legally Intoxicated - Criminal Penalties in All US States
6 0.180 Legally Intoxicated - Criminal Penalties in All US States
7 0.210 Legally Intoxicated - Criminal Penalties in All US States
8 0.240 Legally Intoxicated - Criminal Penalties in All US States
9 0.270 Legally Intoxicated - Criminal Penalties in All US States
10 0.300 Legally Intoxicated - Criminal Penalties in All US States
Press any key to continue . . .

```

```

C:\WINDOWS\system32\cmd.exe

Enter your weight (in lbs): 305
How many minutes has it been since your last drink? 25
Enter your sex as M or F: F
305 pounds, female, 25 minutes since last drink

# drinks    BAC Status
0 0.000 Safe To Drive
1 0.009 Some Impairment
2 0.023 Some Impairment
3 0.038 Some Impairment
4 0.053 Driving Skills Significantly Affected
5 0.068 Driving Skills Significantly Affected
6 0.082 Criminal Penalties in Most US States
7 0.097 Criminal Penalties in Most US States
8 0.112 Legally Intoxicated - Criminal Penalties in All US States
9 0.127 Legally Intoxicated - Criminal Penalties in All US States
10 0.141 Legally Intoxicated - Criminal Penalties in All US States
Press any key to continue . . .

```

```
C:\WINDOWS\system32\cmd.exe

Enter your weight (in lbs): 449

How many minutes has it been since your last drink? 75

Enter your sex as M or F: M

449 pounds, male, 75 minutes since last drink

# drinks    BAC Status
0 0.000 Safe To Drive
1 0.000 Safe To Drive
2 0.000 Safe To Drive
3 0.007 Some Impairment
4 0.015 Some Impairment
5 0.024 Some Impairment
6 0.032 Some Impairment
7 0.040 Driving Skills Significantly Affected
8 0.049 Driving Skills Significantly Affected
9 0.057 Driving Skills Significantly Affected
10 0.066 Driving Skills Significantly Affected

Press any key to continue . . .
```