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## System Manual

```
int main()      //*****Main function*****//
{

    int weight,duration;
    char sex;
    string gender;
    bool isMale;

    weight=promptForInteger ("Enter your weight (in lbs): ", 0, 1);
    duration=promptForInteger ("Enter time since last drink (in minutes): ", 0, 1);

    sex =promptForMorF("Enter your sex as M or F: ");

    if(sex=='M')
    {
        isMale=true;
        gender="male";
    }
    else
    {
        isMale=false;
        gender= "female";
    }

    cout<<weight << " pound, " << gender<<endl;

    showImpairmentChart(weight, duration, isMale);

}
```

The main function gets the users input for weight, sex, and time since last drink. The main program calls the promptForInteger, promptForMorF and showImpairmentChart function. It also tests the return function from the promptForString, and creates a Boolean variable if the function is male or female.

```
int promptForInteger (string const &message, int lower, int upper)
{

    do
    {
        cout<<message;
        cin>>upper;
```

```

    if(upper>=lower)
        return upper;
    }while(upper<lower);
    return upper;
}

```

The promptForInteger function takes in a message and two variables. It then determines if the upper variable is smaller then the lower variable . If so the program keeps prompting the user to enter a variable that is greater than zero. This is to keep the user from entering in a weight or time that is below zero.

```

char promptForMorF(string const &message)
{
    char sex;

    do
    {
        cout<<message;
        cin>>sex;
    }
    while(sex!='M' && sex!='F');

    return sex;
}

```

The promptForMorF function accepts a message and returns a char variable. The user is prompted to enter their gender and only returns a value of M or F, otherwise is continually prompted.

```

string impairment(double bac)
{
    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!";

    if(bac==safe)
    {
        return(SAFE);
    }
    else if(bac<someImpairment)

```

```

    {
        return(SOMEIMPAIR);
    }
    else if(bac<significantAffected)
    {
        return(SIGNIFICANT);
    }
    else if(bac<someCriminalPenalties)
    {
        return(MOST_STATES);
    }
    else if(bac<=deathPossible)
    {
        return(ALL_STATES);
    }
    else
    {
        return(YOURE_DEAD);
    }
}

```

The impairment function determines the output for a blood alcohol content. Depending on the value of the BAC the string value is returned.

```

void computeBloodAlcoholConcentration(int numDrinks, int weight, int duration, double &maleBAC,
double &femaleBAC)
{
    femaleBAC=0;
    maleBAC=0;
    double x= numDrinks;
    float temp;
    float time=duration;
    time= float ((time/40)/100);
    temp= double (x/weight);

    double total = (temp*3.8) - time;
    if(total<0)
        total=0;

    maleBAC = total;

    double total2= (temp*4.5)- time;
    if(total2<0)
        total2=0;

    femaleBAC=total2;
}

```

The `computeBloodAlcoholConcentration` takes four parameters in and returns nothing. It sets passing by reference values for `maleBAC`, and `femaleBAC` so they can be called throughout the program. The function calculates the BAC by taking the number of drinks consumed and dividing that by weight. The time is then calculated for every 40 minutes the BAC decreases by .01. This value is then subtracted from the BAC value.

```
void showImpairmentChart(int weight, int duration, bool isMale)
{
    double maleBAC,femaleBAC;

    if (isMale==true)
    {
        cout<<"#Drinks    BAC status"<<endl;
        for(int x=0; x<=10;x++)
        {
            computeBloodAlcoholConcentration(x, weight, duration,maleBAC,femaleBAC);
            cout<<x << "    "<<setprecision(3)<<maleBAC<<"    "<<impairment(maleBAC) <<endl;
        }
    }
    else
    {
        cout<<"#Drinks    BAC status"<<endl;
        for(int x=0; x<=10;x++)
        {
            computeBloodAlcoholConcentration(x, weight, duration, maleBAC, femaleBAC);
            cout<<x << "    "<<setprecision(3)<<femaleBAC<<"    "<<impairment(maleBAC) <<endl;
        }
    }
}
```

The `showImpairmentChart` accepts three parameters and returns nothing. The program prints out a table by creating a for loop from zero to ten, and getting their corresponding BAC values. They are each calculated depending in their gender, having different BAC between males and females. A print statement is then used to print the BAC value and the number of drinks associated with it.