# Lab 1

**1.** Write a C++ program which prints the calendar of a month. This program should ask for the following information from user:

Days of month (e.g. 28, 29, 30, 31),

Starting day of week (e.g. 1 for monday, 3 for wednesday, 7 for sunday, etc)

Then, this program should pass these values to a function and this function should display a monthly calendar accordingly.

**Sample Run:**

Enter days of month: **31**

Enter starting day: **3**
```
      1  2  3  4  5
 6  7  8  9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31
```

Enter days of month: **28**
Enter starting day: **6**
```
            1  2
 3  4  5  6  7  8  9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28
```

**2.** When an automobile is moving through the atmosphere, it must overcome a force called drag that works against the motion of the vehicle. The drag force can be expressed as

$$F = \tfrac{1}{2} CD * A * p * V * V$$

where F is the force, CD is the drag coefficient, A is the projected area of the vehicle, p (p = 1.23) is the density of the gas and V is the body's velocity. For an automobile, the range of drag coefficient is from approximately 0.2 to 0.5. Write a program that allows a user to input A and CD interactively and calls a function to compute and return drag force. Your program should call the drag force function, that receives velocity, CD and area values as parameters,

repeatedly and display a table showing drag force for the input shape for a range of velocities from 5 to 40 in increments 5.

**Sample Run:** *(Italics show the hints for the calculations)*

Please enter drag coefficient value : *0.6*

Invalid coefficient value !!!

Please enter drag coefficient value : *0.3*

Please enter projected area : *10*

| Velocity | Drag Coefficient | Area | Force |
|----------|------------------|------|-------|
| 5 | 0.3 | 10 | 46.125 |

Please enter drag coefficient value : *0.4*

Please enter projected area *: 20*

| Velocity | Drag Coefficient | Area | Force |
|----------|------------------|------|-------|
| 10 | 0.4 | 20 | 492 |

**3-** The electric company charges according to the following rate schedule:

   9 cents per kilowatt-hour for the first 300 kwh

   8 cents per kilowatt-hour for the next 300 kwh (up to 600 kwh)

   6 cents per kilowatt-hour for the next 400 kwh (up to 1000 kwh)

   5 cents per kilowatt-hour for all electricity used over 1000 kwh

Write a function that receives necessary parameters to compute the total charge for each customer. Write a main function will input customer number and Kilowatt-hours Used and will call the charge calculation function using the following data:

| Customer Number | Kilowatt-hours Used |
|---|---|
| 123 | 725 |
| 205 | 115 |
| 464 | 600 |
| 596 | 327 |
| 601 | 915 |
| 613 | 1011 |
| 722 | 47 |

**4-** Write a program to model a simple calculator. The input parameters are shown in below.

+      add

-      subtract

*      multiply

/      divide

^      power

q      quit

Your calculator should display the accumulator value after each operation.

**Sample Run:**

Please enter operation symbol and the value: *+ 5*

Result is 5.0

Please enter operation symbol and the value: *^ 2*

Result is 25.0

Please enter operation symbol and the value: */ 2*

Result is 12.5

Please enter operation symbol and the value: *q 0*

Final result is 12.5