1. Compute the value of sin(x) using the below Taylor series expansion. Your program should read number of terms (n>10) and value of x (degrees) as the input and compute the approximate value of sin(x) considering the first n terms of the series. Here user enters x in degrees (0 ≤ x ≤ 360) and you should convert it to radians using r = x * π / 180. You can use macro to define the π value using #define PI 3.14159265 and use it in your program.

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \cdots$$

2. The following scheme is used to compute the student grade of a course from the marks secured out of 100.

| Marks | Grade |
|-------|-------|
| 0-49 | F |
| 50-59 | D |
| 60-69 | C |
| 70-79 | B |
| 80-100 | A |

Compute how many students awarded each grade and display the frequency as a bar chart (horizontal) using single "*" for each student. Use sentinel controlled repetition (-1 as sentinel value) in reading the students marks. Use else-if ladder/switch case to compute the grade and the corresponding frequency.

3. (Optional) Modify the program 2 to print the bar chart vertically.
   Sample bar chart when the class has 7-A, 10-B, 3-C, 7-D and 1-F grades.

```
        Horizontal Bar Chart    Vertical Bar Chart
                                        *
                                        *
                                        *
        A: *******               *   *       *
        B: **********             *   *       *
        C: ***                    *   *       *
        D: *******                *   *       *
        F: *                      *   *   *   *
                                  *   *   *   *
                                  *   *   *   *   *
                                  A   B   C   D   F
```