1. A class of $n$ students, take an examination. The data is to be read as a pair of integers, the first is the roll number and the second, marks obtained. The data is not necessarily ordered. Write a program to do the following jobs.

   (a) Print average marks.
   (b) Find and print the roll numbers with highest marks and lowest marks.
   (c) Print the list of roll numbers which are below average.

2. Write a program to calculate the dot product of two $n$-dimensional vectors, which is defined as
$$\mathbf{A} \cdot \mathbf{B} = \sum_{i=1}^{n} A_i B_i$$

3. Write a program that first inputs the coefficients of a polynomial of degree $n$ and then calculates its value at given $x$ using following formula.
$$P(x) = a_0 + x(a1 + x(a2 + \cdots + x(a_{n-1} + x a_n)) \cdots)$$

4. Write a program to sort a list of $n$ integers.

5. **Optional Problem** Write a program to draw a graph of the function
$$f(x) = 3\sin(x) + 4\cos(x)$$
(where $0 \leq x \leq 1$) on the screen. Assume that your screen has 21 lines and 80 columns. The x axis is along the vertical direction and y axis along horizontal direction. Here are the hints

   (a) Choose $x_i$ values at the interval of 0.05, and $0 \leq i \leq 20$.
   (b) Calculate $y_i = f(x_i)$ for each $i$.
   (c) find the minimum and maximum of $y_i$ and choose the scale for the y axis of the graph.
   (d) Plot of sin(x) is shown here as an example.