Submission: Friday, 22 March, 2024 by 11:59 pm (Submit in ELMS)

Q.1 Write a program that **creates a chessboard**, sets all the pieces on it and then displays the contents of the board.

i. Create a **two-dimensional array**, fill it with data and **print a letter** when a piece is on the field and **a space** when there is no piece. Store one letter for one piece. For now, we don't need any information about the color of the pieces.

ii. The **starting positions** (with letters which symbolize each piece) for all pieces are:
- ✓ The **rooks (R)** are placed on the outside corners, right and left edge (white on the 1st and black on the 8th line).
- ✓ The **knights (N)** are placed immediately inside of the rooks.
- ✓ The **bishops (B)** are placed immediately inside of the knights.
- ✓ The **queen (Q)** is placed on the central square of the same color as that of the player: white queen on the white square and black queen on the black square. Both stand on the d rank: **white queen** on the **d1** field and **black queen** on the **d8** field.
- ✓ The **king (K)** takes the vacant spot next to the queen.
- ✓ The **pawns (P - not the official symbol, but you need to print something)** are placed one square in front of all of the other pieces.

Example output

```
R N B Q K B N R
P  P  P P P  P P P




P  P  P P P  P P P
R N B Q K B N R
```

Q.2 The **Fibonacci sequence** is a series of natural numbers built up by a simple formula:

The **first Fibonacci number** is equal to 1;

The **second Fibonacci number** is equal to 1 too;

The **third, fourth and every subsequent Fibonacci number** is equal to the **sum of the two previous numbers**. This means that the first 5 Fibonacci numbers look as follows: 1, 1, 2, 3, 5

Write a **C program** that prints this Fibonacci sequence and two of its subsequent numbers. It should print the **first 10 numbers** from the Fibonacci sequence, and then it should print **only the odd numbers** (1st, 3rd, 5th, 7th and 9th), and after that, **only the even numbers** (2nd, 4th, 6th, 8th and 10th). Your version of the program must print the same result as the expected output.

Example output

```
First 10 Fibonacci numbers: 1 1 2 3 5 8 13 21 34 55

Odd Fibonacci numbers (1st, 3rd, 5th, 7th and 9th): 1 2 5 13 34

Even numbers (2nd, 4th, 6th, 8th and 10th): 1 3 8 21 55
```

Q.3 Check the program below. **Find** all possible **compilation errors** and **logic errors**. **Fix them**. Your version of the program must print the same result as the **expected output**. Before you use your compiler, try to find the errors only by manual code analysis.

```
#include <stdio.h>
int main() {
   int zeros[10] = { 0 };
   int ones[] = { 1, };
   int superOnes[5] = { 1 };
   int fiboSequence[6] = { 1, 1, 2, 3, 5, 8, 13 };
   int i;
   for (i = 0; i<15; i++) {
        printf("%d ", zeros[i]);
   }
   puts("");
   for (i = 0; i<4; i++) {
        printf("%p ", ones[x]);
   }
   puts("");
   for (i = 0; i<5; i++) {
        printf("%e ", superOnes[]);
   }
   puts("");
   for (i = 0; i<6; i++) {
        printf("%q ", fiboSequence[i]);
   }
   puts("");
   return 0;
}
```

Example output

```
0 0 0 0 0 0 0 0 0 0
1 1
1 1 1 1 1
1 1 2 3 5 8
```

Q.4 Write a **C program** to display the following **pattern**:

```
1   6   10   13   15
2   7   11   14
3   8   12
4   9
5
```