C Programming language Practical

Q1.) How to check whether the entered year is leap or not, using if else statement.

Answer.)

```
#include <stdio.h>

int main() {
   int year;

   // Taking input from the user
   printf("Enter a year: ");
   scanf("%d", &year);

   // Checking if the year is a leap year
   if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
      printf("%d is a leap year.\n", year);
   } else {
      printf("%d is not a leap year.\n", year);
   }

   return 0;
}
```

Output

```
Enter a year : 2023
2023 is not a leap year .
```

Output

```
Enter a year : 2024
2024 is a leap year .
```

Q.2) How to swap the values of two variables using pointers.

Answer.)

```
#include <stdio.h>

void swap(int *a, int *b) {
   int temp = *a;
   *a = *b;
   *b = temp;
}

int main() {
   int x, y;

   printf("Enter value for x: ");
   scanf("%d", &x);
   printf("Enter value for y: ");
   scanf("%d", &y);

   printf("Before swapping: x = %d, y = %d\n", x, y);

   // Passing the addresses of x and y to the swap function
   swap(&x, &y);

   printf("After swapping: x = %d, y = %d\n", x, y);

   return 0;
}
```

Output

```
Enter value for x:  27
Enter value for y: 09
Before swapping: x = 27 , y =9
After swapping: x = 9 , y = 27
```

Q.3) How to check an alphabet is vowel or consonant.

Answer.)

```
#include <stdio.h>

int main() {
   char ch;

   // Input a character
   printf("Enter a character: ");
   scanf(" %c", &ch);

   // Check if the entered character is a vowel or consonant
   if ((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z')) {
      if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u' ||
         ch == 'A' || ch == 'E' || ch == 'I' || ch == 'O' || ch == 'U') {
         printf("%c is a vowel.\n", ch);
      } else {
         printf("%c is a consonant.\n", ch);
      }
   } else {
      printf("Invalid input. Please enter an alphabet.\n");
   }

   return 0;
}
```

Output

```
Enter a character: a
a is a vowel .
```

Output

```
Enter a character: g
g is a consonant .
```

Q.4) How to display the fibonacci sequence.

Answer.)

```
#include <stdio.h>

void fibonacci(int n) {
   int first = 0, second = 1, next, i;

   printf("Fibonacci sequence up to %d terms:\n", n);

   for (i = 0; i < n; i++) {
      if (i <= 1) {
         next = i;
      } else {
         next = first + second;
         first = second;
         second = next;
      }
      printf("%d ", next);
   }
   printf("\n");
}

int main() {
   int terms;

   printf("Enter the number of terms: ");
   scanf("%d", &terms);

   // Display the Fibonacci sequence
   fibonacci(terms);

   return 0;
}
```

Output

```
Enter the number of terms:
Fibonacci sequence up to 5 terms:
0 1 1 2 3
```

Q.5) How to transpose a matrix in C programming.

Answer

```
#include <stdio.h>
#define MAX_ROWS 10
#define MAX_COLS 10
void transposeMatrix(int mat[MAX_ROWS][MAX_COLS], int rows, int cols) {
   int transposed[MAX_COLS][MAX_ROWS];
   int i, j;
 // Transpose the matrix
   for (i = 0; i < cols; i++) {
      for (j = 0; j < rows; j++) {
         transposed[i][j] = mat[j][i];
      }
   }
// Display the transposed matrix
   printf("Transposed matrix:\n");
   for (i = 0; i < cols; i++) {
      for (j = 0; j < rows; j++) {
         printf("%d ", transposed[i][j]);
      }
      printf("\n");
   }
}

int main() {
   int matrix[MAX_ROWS][MAX_COLS];
   int rows, cols, i, j;

   printf("Enter number of rows and columns of the matrix: ");
   scanf("%d %d", &rows, &cols);

   printf("Enter elements of the matrix:\n");
   for (i = 0; i < rows; i++) {
      for (j = 0; j < cols; j++) {
         scanf("%d", &matrix[i][j]);
      }
   }
// Display the original matrix
   printf("Original matrix:\n");
   for (i = 0; i < rows; i++) {
      for (j = 0; j < cols; j++) {
         printf("%d ", matrix[i][j]);
      }
      printf("\n");
   }
// Transpose the matrix and display the transposed matrix
   transposeMatrix(matrix, rows, cols);
 return 0;
}
```

Output

```
Enter number of rows and columns of the matrix: 2
3
Enter elements of the matrix:
3
2
2
2
3
2
Original matrix:
3 2 2
2 3 2
Transposed matrix:
3 2
2 3
2 2
```

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