C	PYTHON

8.

```c
#include <stdio.h>

int main() {
    int N;
    printf("Enter N: ");
    scanf("%d", &N);
    for (int i = 0; i < N; i++) {
        for (int j = 0; j < N - i; j++) {
            printf("%c", 'A' + i + j);
        }
        printf("\n");
    }
    return 0;
}
```

9.

```c
#include <stdio.h>

int main() {
    int N;
    scanf("%d", &N);
    for (int i = 0; i < N; i++) {
        for (int j = 0; j <= i; j++) {
            printf("%c", 'A' + i + j);
        }
        printf("\n");
    }
    return 0;
}
```

10.

```c
#include <stdio.h>

int main() {
    int N;
    scanf("%d", &N);
    for (int i = 0; i < N; i++) {
        char ch = 'A';
        for (int j = 0; j <= i; j++) {
            printf("%c", ch);
            ch += 2;
        }
        printf("\n");
    }
    return 0;
}
```

11.

```
#include <stdio.h>

int main() {
   int N;
   scanf("%d", &N);
   for (int i = 1; i <= N; i++) {
      for (int j = 1; j <= i; j++) {
         printf("%d", j);
      }
      printf("\n");
   }
   return 0;
}
```

12.

```
#include <stdio.h>

int main() {
   int N;
   scanf("%d", &N);
   for (int i = 0; i < N; i++) {
      for (int j = 0; j < N; j++) {
         printf("%d", (i == j || i + j == N - 1) ? 1 :
0);
      }
      printf("\n");
   }
   return 0;
}
```

13.

```
#include <stdio.h>

int main() {
   int N;
   scanf("%d", &N);
   for (int i = 1; i <= N; i++) {
      for (int space = 0; space < N - i; space++)
printf(" ");
      for (int j = 1; j <= i; j++) printf("%d", j);
      for (int j = i - 1; j >= 1; j--) printf("%d", j);
      printf("\n");
   }
   return 0;
}
```

14.

```
#include <stdio.h>

int main() {
   int N;
   scanf("%d", &N);
   for (int i = 0; i < N; i++) {
      int num = 1;
      for (int space = 0; space < N - i - 1; space++)
printf(" ");
      for (int j = 0; j <= i; j++) {
         printf("%d ", num);
         num = num * (i - j) / (j + 1);
      }
      printf("\n");
   }
   return 0;
}
```

1. Read and display elements of 1D array

```c
#include <stdio.h>

int main() {
   int n;
   printf("Enter the number of elements: ");
   scanf("%d", &n);
   int arr[n];
   printf("Enter %d elements:\n", n);
   for(int i = 0; i < n; i++) scanf("%d", &arr[i]);
   printf("Array elements are:\n");
   for(int i = 0; i < n; i++) printf("%d ", arr[i]);
   return 0;
}
```

2. Read and display elements of 2D array

```c
#include <stdio.h>

int main() {
   int rows, cols;
   printf("Enter rows and columns: ");
   scanf("%d %d", &rows, &cols);
   int arr[rows][cols];
   printf("Enter elements:\n");
   for(int i = 0; i < rows; i++)
      for(int j = 0; j < cols; j++)
         scanf("%d", &arr[i][j]);
   printf("Array elements are:\n");
   for(int i = 0; i < rows; i++) {
      for(int j = 0; j < cols; j++)
         printf("%d ", arr[i][j]);
      printf("\n");
   }
   return 0;
}
```

3. copy the elements of one array into another array.

```c
#include <stdio.h>

int main() {
   int n;
   printf("Enter the number of elements: ");
   scanf("%d", &n);
   int arr1[n], arr2[n];
   printf("Enter elements of the first array:\n");
   for(int i = 0; i < n; i++) scanf("%d", &arr1[i]);
   for(int i = 0; i < n; i++) arr2[i] = arr1[i];
```

1. Read and display elements of 1D array

```python
n = int(input("Enter the number of elements: "))
arr = []
print("Enter the elements:")
for _ in range(n):
   arr.append(int(input()))
print("Array elements are:")
for elem in arr:
   print(elem, end=" ")
```

2. Read and display elements of 2D array

```python
rows = int(input("Enter rows: "))
cols = int(input("Enter columns: "))
arr = []
for i in range(rows):
   arr.append([0] * cols)
print("Enter elements:")
for i in range(rows):
   for j in range(cols):
      arr[i][j] = int(input())
print("Array elements are:")
for i in range(rows):
   for j in range(cols):
      print(arr[i][j], end=" ")
   print()
```

3. copy the elements of one array into another array.

```python
n = int(input("Enter the number of elements: "))
arr1 = []
print("Enter elements of the first array:")
for _ in range(n):
   arr1.append(int(input()))
arr2 = [0] * n
for i in range(n):
   arr2[i] = arr1[i]
print("Elements of the second array:")
for elem in arr2:
```

```
    printf("Elements of the second array:\n");
    for(int i = 0; i < n; i++) printf("%d ", arr2[i]);
    return 0;
}
```

4. count the frequency of each element of an array.

```
#include <stdio.h>
int main() {
    int n;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int arr[n], freq[n];
    printf("Enter the elements:\n");
    for(int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
        freq[i] = -1;
    }
    for(int i = 0; i < n; i++) {
        if(freq[i] != 0) {
            int count = 1;
            for(int j = i + 1; j < n; j++) {
                if(arr[i] == arr[j]) {
                    count++;
                    freq[j] = 0;
                }
            }
            freq[i] = count;
        }
    }
    printf("Frequency of each element:\n");
    for(int i = 0; i < n; i++) {
        if(freq[i] != 0)
            printf("%d occurs %d times\n", arr[i],
freq[i]);
    }
    return 0;
}
```

5. 3 x 3 matrix addition

```
#include <stdio.h>
int main() {
    int a[3][3], b[3][3], sum[3][3];
    printf("Enter elements of the first 3x3
matrix:\n");
    for(int i = 0; i < 3; i++)
        for(int j = 0; j < 3; j++)
            scanf("%d", &a[i][j]);
```

```
    print(elem, end=" ")
```

4. count the frequency of each element of an array.

```
n = int(input("Enter the number of elements: "))
arr = []
print("Enter the elements:")
for _ in range(n):
    arr.append(int(input()))
freq = [-1] * n
for i in range(n):
    if freq[i] != 0:
        count = 1
        for j in range(i + 1, n):
            if arr[i] == arr[j]:
                count += 1
                freq[j] = 0
        freq[i] = count
print("Frequency of each element:")
for i in range(n):
    if freq[i] != 0:
        print(f"{arr[i]} occurs {freq[i]} times")
```

5. 3 x 3 matrix addition

```
a = [[0]*3 for _ in range(3)]
b = [[0]*3 for _ in range(3)]
sum_matrix = [[0]*3 for _ in range(3)]

print("Enter elements of the first 3x3 matrix:")
for i in range(3):
    for j in range(3):
        a[i][j] = int(input())
```

```
   printf("Enter elements of the second 3x3
matrix:\n");
   for(int i = 0; i < 3; i++)
      for(int j = 0; j < 3; j++)
         scanf("%d", &b[i][j]);
   for(int i = 0; i < 3; i++)
      for(int j = 0; j < 3; j++)
         sum[i][j] = a[i][j] + b[i][j];
   printf("Sum of the matrices:\n");
   for(int i = 0; i < 3; i++) {
      for(int j = 0; j < 3; j++)
         printf("%d ", sum[i][j]);
      printf("\n");
   }
   return 0;
}
```

```
print("Enter elements of the second 3x3
matrix:")
for i in range(3):
   for j in range(3):
      b[i][j] = int(input())

for i in range(3):
   for j in range(3):
      sum_matrix[i][j] = a[i][j] + b[i][j]

print("Sum of the matrices:")
for i in range(3):
   for j in range(3):
      print(sum_matrix[i][j], end=" ")
   print()
```

6. largest element in array.

```
#include <stdio.h>
int main() {
   int n;
   printf("Enter the number of elements: ");
   scanf("%d", &n);
   int arr[n];
   printf("Enter the elements:\n");
   for(int i = 0; i < n; i++) scanf("%d", &arr[i]);
   int max = arr[0];
   for(int i = 1; i < n; i++)
      if(arr[i] > max) max = arr[i];
   printf("Largest element: %d\n", max);
   return 0;
}
```

6. largest element in array.

```
n = int(input("Enter the number of elements: "))
arr = []
print("Enter the elements:")
for _ in range(n):
   arr.append(int(input()))
max_elem = arr[0]
for i in range(1, n):
   if arr[i] > max_elem:
      max_elem = arr[i]
print("Largest element:", max_elem)
```

7. sort elements of array in ascending order

```
#include <stdio.h>
int main() {
   int n, temp;
   printf("Enter the number of elements: ");
   scanf("%d", &n);
   int arr[n];
   printf("Enter the elements:\n");
   for(int i = 0; i < n; i++) scanf("%d", &arr[i]);
   for(int i = 0; i < n - 1; i++)
      for(int j = i + 1; j < n; j++)
         if(arr[i] > arr[j]) {
            temp = arr[i];
            arr[i] = arr[j];
            arr[j] = temp;
         }
```

7. sort elements of array in ascending order

```
n = int(input("Enter the number of elements: "))
arr = []
print("Enter the elements:")
for _ in range(n):
   arr.append(int(input()))
for i in range(n - 1):
   for j in range(i + 1, n):
      if arr[i] > arr[j]:
         arr[i], arr[j] = arr[j], arr[i]
print("Sorted array in ascending order:")
for elem in arr:
   print(elem, end=" ")
```

```
    printf("Sorted array in ascending order:\n");
    for(int i = 0; i < n; i++) printf("%d ", arr[i]);
    return 0;
}
```

8. reverse an array.

```
#include <stdio.h>
int main() {
    int n, temp;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter the elements:\n");
    for(int i = 0; i < n; i++) scanf("%d", &arr[i]);
    for(int i = 0; i < n / 2; i++) {
        temp = arr[i];
        arr[i] = arr[n - i - 1];
        arr[n - i - 1] = temp;
    }
    printf("Reversed array:\n");
    for(int i = 0; i < n; i++) printf("%d ", arr[i]);
    return 0;
}
```

8. reverse an array.

```
n = int(input("Enter the number of elements: "))
arr = []
print("Enter the elements:")
for _ in range(n):
    arr.append(int(input()))
for i in range(n // 2):
    arr[i], arr[n - i - 1] = arr[n - i - 1], arr[i]
print("Reversed array:")
for elem in arr:
    print(elem, end=" ")
```

9. split an array

```
#include <stdio.h>
int main() {
    int n;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter the elements:\n");
    for(int i = 0; i < n; i++) scanf("%d", &arr[i]);
    int mid = n / 2;
    printf("First half:\n");
    for(int i = 0; i < mid; i++) printf("%d ", arr[i]);
    printf("\nSecond half:\n");
    for(int i = mid; i < n; i++) printf("%d ", arr[i]);
    return 0;
}
```

9. split an array

```
n = int(input("Enter the number of elements: "))
arr = []
print("Enter the elements:")
for _ in range(n):
    arr.append(int(input()))
mid = n // 2
print("First half:")
for i in range(mid):
    print(arr[i], end=" ")
print("\nSecond half:")
for i in range(mid, n):
    print(arr[i], end=" ")
```

10. merge two arrays

```
#include <stdio.h>
int main() {
    int n1, n2;
    printf("Enter the number of elements in the
first array: ");
    scanf("%d", &n1);
```

10. merge two arrays

```
n1 = int(input("Enter the number of elements in
the first array: "))
arr1 = []
print("Enter elements of the first array:")
for _ in range(n1):
    arr1.append(int(input()))
```

```
   int arr1[n1];
   printf("Enter elements of the first array:\n");
   for(int i = 0; i < n1; i++) scanf("%d", &arr1[i]);

   printf("Enter the number of elements in the
second array: ");
   scanf("%d", &n2);
   int arr2[n2], merged[n1 + n2];
   printf("Enter elements of the second
array:\n");
   for(int i = 0; i < n2; i++) scanf("%d", &arr2[i]);

   for(int i = 0; i < n1; i++) merged[i] = arr1[i];
   for(int i = 0; i < n2; i++) merged[n1 + i] =
arr2[i];

   printf("Merged array:\n");
   for(int i = 0; i < n1 + n2; i++) printf("%d ",
merged[i]);
   return 0;
}
```

```
n2 = int(input("Enter the number of elements in
the second array: "))
arr2 = []
print("Enter elements of the second array:")
for _ in range(n2):
   arr2.append(int(input()))

merged = [0] * (n1 + n2)
for i in range(n1):
   merged[i] = arr1[i]
for i in range(n2):
   merged[n1 + i] = arr2[i]

print("Merged array:")
for elem in merged:
   print(elem, end=" ")
```

11. check an element is present or not in one 1D array.

```
#include <stdio.h>
int main() {
   int n, key, found = 0;
   printf("Enter the number of elements: ");
   scanf("%d", &n);
   int arr[n];
   printf("Enter the elements:\n");
   for(int i = 0; i < n; i++) scanf("%d", &arr[i]);
   printf("Enter the element to search: ");
   scanf("%d", &key);
   for(int i = 0; i < n; i++) {
      if(arr[i] == key) {
         found = 1;
         break;
      }
   }
   if(found) printf("Element is present.\n");
   else printf("Element is not present.\n");
   return 0;
}
```

11. check an element is present or not in one 1D array.

```
n = int(input("Enter the number of elements: "))
arr = []
print("Enter the elements:")
for _ in range(n):
   arr.append(int(input()))
key = int(input("Enter the element to search: "))
found = 0
for i in range(n):
   if arr[i] == key:
      found = 1
      break
if found:
   print("Element is present.")
else:
   print("Element is not present.")
```

12. find the number of even and odd positions elements in 1D array.

```
#include <stdio.h>
int main() {
```

12. find the number of even and odd positions elements in 1D array.

```
n = int(input("Enter the number of elements: "))
arr = []
```

```
    int n, evenCount = 0, oddCount = 0;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter the elements:\n");
    for(int i = 0; i < n; i++) scanf("%d", &arr[i]);
    for(int i = 0; i < n; i++) {
        if((i + 1) % 2 == 0) evenCount++;
        else oddCount++;
    }
    printf("Elements at even positions: %d\n",
evenCount);
    printf("Elements at odd positions: %d\n",
oddCount);
    return 0;
}
```

```
print("Enter the elements:")
for _ in range(n):
    arr.append(int(input()))
even_count = 0
odd_count = 0
for i in range(n):
    if (i + 1) % 2 == 0:
        even_count += 1
    else:
        odd_count += 1
print("Elements at even positions:",
even_count)
print("Elements at odd positions:", odd_count)
```