**Roll No…………….. Total No. of Pages:……**

**FUNDAMENTALS OF C PROGRAMMING**

**Time allowed: 90 Minutes Max. Marks: 40**

**General Instructions:**

* **Follow the instructions given in each section.**
* **Make sure that you attempt the questions in order.**

**SECTION-A (10\*1 mark=10 marks)**

***(All questions are compulsory)***

Q1 What is the syntax for declaring an array in C language?

A) int array[10]; \*(Correct option)

B) float array;

C) char array[];

D) None of the above

Q2 What is the use of a pointer in C language?

A) To store the address of a variable \*(Correct option)

B) To store the value of a variable

C) To store data in an array

D) None of the above

Q3 What is the purpose of a function in C language?

A) To break a program into smaller modules

B) To perform specific tasks \*(Correct option)

C) To store data

D) All of the above

Q4 What is the difference between a while loop and a do-while loop in C language?

A) While loops check conditions before execution, do-while loops check conditions after execution \*(Correct option)

B) While loops only execute once, do-while loops execute multiple times

C) While loops cannot handle complex conditions, do-while loops can handle complex conditions

D) None of the above

Q5 What is the difference between a local variable and a global variable in C language?

A) Local variables are only accessible within a function, global variables are accessible throughout the program \*(Correct option)

B) Global variables are only accessible within a function, local variables are accessible throughout the program

C) Local and global variables are the same

D) None of the above

Q6 What is the value of an uninitialized variable in C language?

A) 0

B) Garbage value \*(Correct option)

C) NULL

D) None of the above

Q7 What is the purpose of a break statement in C language?

A) To skip an iteration in a loop

B) To exit a loop \*(Correct option)

C) To exit a function

D) All of the above

Q8 What is the syntax for a while loop in C language?

A) while(condition){}\*(Correct option)

B) do{} while(condition)

C) for(;;){}

D) None of the above

Q9 What is the purpose of a continue statement in C language?

A) To skip an iteration in a loop \*(Correct option)

B) To exit a loop

C) To exit a function

D) All of the above

Q10 What is the difference between a pre-increment and a post-increment operator in C language?

A) Pre-increment increments the value before use, post-increment increments the value after use \*(Correct option)

B) Post-increment increments the value before use, pre-increment increments the value after use

C) Both pre-increment and post-increment are the same

D) None of the above

**SECTION-B (5\*2 mark=10 marks)**

***(All questions are compulsory)***

11.What is the difference between a for loop and a while loop in C?

a) There is no difference, both for and while loops are the same

b) The for loop allows you to specify the number of times the loop will run, while the while loop runs until a certain condition is met \*(Correct option)

c) The while loop allows you to specify the number of times the loop will run, while the for loop runs until a certain condition is met

d) The while loop is faster than the for loop

12. What is the purpose of parameters in a function in C?

a) To specify the return value of the function

b) To receive input data and pass it to the function \*(Correct option)

c) To perform mathematical operations

d) To control the flow of the program

13. What will be the output of the following code?

int x = 10;

int \*ptr1 = &x;

int \*ptr2 = ptr1;

\*ptr1 = 20;

printf("%d %d", \*ptr1, \*ptr2);

a) 20 20 \*(Correct option)

b) 20 10

c) 10 20

d) 10 10

14. What will be the output of the following code?

int arr[5] = {10, 20, 30, 40, 50};

printf("%d", \*(arr+3));

a) 10

b) 20

c) 30

d) 40 \*(Correct option)

15. What will be the output of the following code?

char string1[10] = "WelcomeTo”;

char string2[10] = "ChitkaraUniversity";

strncat(string1,string2, 8);

printf("%s", string1);

a) ' Welcome'

b) ' WelcomeTo'

c) ' WelcomeToChitkaraUniversity'

d) " WelcomeToChitkara" \*(Correct option)

**SECTION-C(Coding Question) (2x5 marks=5 marks)**

Q16. Chaitanya Mom used to give him pocket money every day based on his performance throughout the day. This pocket money can be negative or positive based on his performance. If it is negative that means Chaitanya has to give money back to his mom. If the pocket money is positive that means he performs well today and his mom will give him some money. Your task is to find the maximum pocket money Chaitanya has at any contiguous day.

**Input:**

Given an integer number N representing the number of days.

In the next line, given an array A of size N, where A[i] is the pocket money at the end of each day.

**Constraints:**

1 <= N <= 106

-1000 <= A[i] <= 1000

**Output:**

Print the maximum pocket money Chaitanya has at the end of Nth day.

Sample test Cases

|  |  |  |
| --- | --- | --- |
|  | Input | Output |
| STC1 | 5  8 -10 5 6 7 | 18 |
| STC2 | 5  -2 -3 -11 -5 -10 | -2 |

**Solution 16:**

#include<stdio.h>

int max(int num1, int num2)

{

return (num1 > num2 ) ? num1 : num2;

}

int solve(int A[],int n1) {

int ans =A[0],x=A[0];

for(int i=1;i<n1;i++)

{

x = max(A[i],x+A[i]);

ans = max(x,ans);

}

return ans;

}

int main()

{

int n;

scanf("%d",&n);

int a[n];

for(int i=0;i<n;i++)

{

scanf("%d",&a[i]);

}

printf("%d",solve(a,n));

return 0;

}

Test Cases

|  |  |  |  |
| --- | --- | --- | --- |
|  | Test Case 1 | Test Case 2 | Test Case 3 |
| Input | 5  1 2 3 4 -10 | 9  -2 1 -3 4 -1 2 1 -5 4 | 3  -125 -20 -130 |
| Output | 10 | 6 | -20 |

Q17. Suppose you are given a number in binary form, your job is to convert the binary number to decimal form.

**Input:**

Input n, is the binary number (0 and 1 only). Example 1110

n can be entered maximum to 4 digits

**Output:**

Given n, output is a decimal number. example 14

**Solution:**

#include <stdio.h>

void main()

{

int num, binary\_val, decimal\_val = 0, base = 1, rem;

printf("Enter a binary number(1s and 0s) \n");

scanf("%d", &num);

binary\_val = num;

while (num > 0)

{

rem = num % 10;

decimal\_val = decimal\_val + rem \* base;

num = num / 10 ;

base = base \* 2;

}

printf("The Binary number is = %d \n", binary\_val);

printf("Its decimal equivalent is = %d \n", decimal\_val);

}

|  |  |  |  |
| --- | --- | --- | --- |
|  | Test Case 1 | Test Case 2 | Test Case 3 |
| Input | 1111 | 0000 | 1100 |
| Output | 15 | 0 | 12 |

**SECTION-D (Coding Question)(1x10 mark=10 mark)**

Q18 **Problem Statement: Write a function in C to find the longest common prefix in a set of strings.**

**Sample Input**:

["flower", "flow", "flight"] \\ Number of elements in the array

**Sample Output**:

The longest common prefix is: "fl"

|  |  |  |  |
| --- | --- | --- | --- |
|  | Test Case 1 | Test Case 2 | Test Case 3 |
| Input | ["flower", "flow", "flight"] | ["dog", "racecar", "car"] | ["apple", "ape", "april"] |
| Output | The longest common prefix is: "fl" | The longest common prefix is: "" | The longest common prefix is: "ap" |

**Solution:**

#include <stdio.h>

#include <string.h>

#include <stdbool.h>

char\* longestCommonPrefix(char\*\* strs, int strsSize) {

if (strsSize == 0) {

return "";

}

int i, j;

int minLen = INT\_MAX;

for (i = 0; i < strsSize; i++) {

int len = strlen(strs[i]);

if (len < minLen) {

minLen = len;

}

}

char prefix[minLen + 1];

for (i = 0; i < minLen; i++) {

char current = strs[0][i];

for (j = 1; j < strsSize; j++) {

if (strs[j][i] != current) {

break;

}

}

if (j == strsSize) {

prefix[i] = current;

} else {

break;

}

}

prefix[i] = '\0';

char \*result = prefix;

return result;

}

int main() {

int strsSize;

printf("Enter the number of strings: ");

scanf("%d", &strsSize);

char \*strs[strsSize];

for (int i = 0; i < strsSize; i++) {

strs[i] = malloc(100 \* sizeof(char));

printf("Enter string %d: ", i + 1);

scanf("%s", strs[i]);

}

char \*result = longestCommonPrefix(strs, strsSize);

printf("The longest common prefix is: %s\n", result);

return 0;

}