**G L Bajaj Institute of Technology & Management**

**Department of Master of Computer Applications**

**List of programs**

**Subject Code: KCA 151 Subject Name: Problem Solving Using C Lab**

**UNIT 1**

1. Write a program to input and add two numbers

2. Write a program to convert Fahrenheit to Celsius and Celsius to Fahrenheit.

3. Write a program to calculate Area of a rectangle

4. Write a program to Calculate Area and Perimeter of a Circle

5. Write a program to determine the roots of quadratic equation

6. Write a program to Calculate Simple Interest

7. Write a program to Calculate Compound Interest

8. Write a program to swap two numbers using third variable, without using third variable, within single statement using comma operator.

9. Write a program to input two numbers and find the greatest number using ternary operator.

10. Write a program to find odd/even number using ternary operator.

11. Write a program to Input three numbers and find greatest number using ternary operator.

12. Enter arithmetic operator from user, perform operation on two numbers according to the operator using ternary operator.

13. Find odd/even number using bitwise operator.

14. Write a program to swap two numbers using bitwise operator.

15. Find exact power of 2 of a given number using bitwise operator.

**UNIT 2**

1. Write a program to input the annual taxable income and compute the tax according to the given condition.

|  |  |
| --- | --- |
| Total Annual Taxable Income | Tax Rate |
| Up to Rs. 1,00,000 | No Tax |
| From 1,00,001 to 1,50,000 | 10% of the income tax exceeding Rs. 1,00,000 |
| From 1,50,001 to 2,50,000 | Rs. 5000 + 20% of the income tax exceeding Rs. 1,50,000 |
| Above 2,50,000 | Rs. 25000 + 30% of the income tax exceeding Rs. 2,50,000 |

2. Write a program to input the marks obtained by student in 3 different subjects. Find the average marks of subject and allocate a grade to the student as per the following rule.

|  |  |
| --- | --- |
| Average Marks | Grade |
| 90 -100 | A |
| 80-89 | B |
| 70-79 | C |
| 60-69 | D |
| 50-59 | E |
| 0-49 | F |

3. Write a program to calculate the monthly telephone bills as per the following rule.

* Minimum Rs. 100 for up to 50 calls
* Plus Rs. 0.80 per call for next 50 calls
* Plus Rs. 0.60 per call for next 100 calls
* Plus Rs. 0.40 per call for any call beyond 200 calls

4. Write a program to find the largest of three numbers using nested if else.

5. Write a program to find the year is leap year or not.

6. Write a program to receive marks of physics, chemistry & math’s from user & check its eligibility for course if

a) Marks of physics > 40

b) Marks of chemistry > 50

c) Marks of math’s > 60

d) Total of physics & math’s marks > 150

or

e) Total of three subjects marks > 200

7. Write a program to perform arithmetic calculation on two integers.

8. Write a currency program that tells you how many 500,200,100,50,20,10,5,2 and 1 Rs. notes will be needed for a given amount of money.

9. Write a program to print pattern...

\*

\* \*

\* \* \*

\* \* \* \*

\* \* \* \* \*

10. Write a program to print the pattern.

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

11. Write a program to print pattern...

1

2 3 2

3 4 5 4 3

4 5 6 7 6 5 4

5 6 7 8 9 8 7 6 5

12. Write a program to calculate the factorial for given number using function

13. Write a program to print area of rectangle using function & return its value to main function.

14. Write a program to find sum of Fibonacci series up to N (where N is entered through

keyboard) using function

15. Write a program to find the factorial of given number using recursion.

16. Write a program to calculate the GCD of given numbers using recursion.

17. Write a program to convert decimal number into binary number.

18. Write factorial function & use the function to find the sum of series S=1! +2!+-----n!.

**Unit 3**

* Write a program to enter 10 integer elements in an array and print their sum, average, highest and lowest element.

**Program:**

#include <stdio.h>

int main()

{

int a[10],i,s=0,g,l;

float avg;

printf("Enter 10 Numbers:\n");

for(i=0;i<10;i++)

{

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

s=s+a[i];

avg=s/10.0;

}

printf("Sum of Array Elements = %d\n",s);

printf("Average of Elements = %.2f\n",avg);

g=a[0];

for(i=0;i<10;i++)

if(a[i]>g)

g=a[i];

printf("Greatest Element = %d\n",g);

l=a[0];

for(i=0;i<10;i++)

if(a[i]<l)

l=a[i];

printf("Lowest Element = %d",l);

return 0;

}

**output:**

Enter 10 Numbers:

1

2

3

4

5

6

7

8

9

10

Sum of Array Elements = 55

Average of Elements = 5.50

Greatest Element = 10

Lowest Element = 1

* Write a program to input 10 elements in an array, reverse them and print the reversed array elements. (Position of the elements should be swapped)

**program:**

#include <stdio.h>

int main() {

int a=0,n=10;

int arr[n],arr1[n];

printf("Enter an array: ");

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

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

}

printf("Reversed array: ");

for (int i = n-1; i>=0; i--){

arr1[a]=arr[i];

printf("%d ", arr1[a]);

a=a+1;

}

return 0;

}

**output**:

Enter an array: 1

2

3

4

5

6

7

8

9

10

Reversed array: 10 9 8 7 6 5 4 3 2 1

* Write a program to input 10 elements in an array and swap alternate elements. For example, is the inputted elements are 1,2,3,4,5,6,7,8,9,10 then the resultant array elements should be 2,1,4,3,6,5,8,7,10,9.

**Program:**

* Write a program to input 10 elements in an array and sort them in descending order.
* Write a program to implement matrix addition.
* Write a program to implement matrix multiplication.
* Write a program to input elements in a square matrix and then interchange any two rows/columns and print back the resultant matrix.
* Write a program in to add two numbers using pointers
* Write a program in to add numbers using call by reference
* Write a program in to store n elements in an array and print the elements using pointer
* Write a program in to swap elements using call by reference
* Write a program in to count the number of vowels and consonants in a string using a pointer
* Write a program to enter and display a string
* Write a program to enter a string and find its length with and without string.h function
* Write a program to reverse a string with and without string.h function
* Write a program to concatenate two strings with and without string.h function
* Write a program to compare two strings with and without string.h function
* Write a program having a function that calculates the number of vowels and consonants in a string which is passed as an argument to it.

**UNIT 4**

* Define a structure that can describe a hotel. It should have the member that includes the name, address, grade, room charge and number of rooms. Write a function to print out hotel of given grade in order of room charges.
* Define a structure called cricket with player name, team name, batting average, for 50 players & 5 teams. Print team wise list contains names of player with their batting average.
* Define a structure called person with age and weight. Input and display the structure elements using a pointer to structure.
* Define a structure organization with data members org\_name, org\_number and employee where employee is itself a structure having data members emp\_id, emp\_name and salary.. Input a display two different organizations having 5 employees each.
* Define a union called DATA with one integer, one float ant one string elements. Input and display DATA along with the size.
* Define a Union and a Structure with one integer, one float and one string element each. Display the memory taken by both. Underline the difference.
* Define and enum called as Days consisting of days of the week. Create a variable for Days, assign it a particular day (for example Wednesday) and print its value (which should be 3 in this case.)
* Define enum fruits{ mango=2, apple=1, strawberry=5, papaya=7, }. Create a variable assign it a value ( say apple) and print its value ( 1 in this case).
* Create a function display, assign a static variable inside display, increase its value by 5 and print. Call this function twice from main to showcase the uses of static variables.

**UNIT 5**

* Assign the memory of an array of 10 integers to a pointer variable using malloc. Input the values using pointer variable and find the sum of all the elements again using pointer variables only.
* Input an integer variable SIZE from keyboard. Assign the memory of an array of size ‘SIZE’ integers to a pointer variable using calloc. Input the values using pointer variable and display them.
* Rewrite the program mentioned in 1 above. Resize the array to 15 elements using realloc function, input values and display them.
* Write a program to copy the contents of a file to another file.
* Write a program to read & write text from file made in 4 above, using fscanf and fprintf.
* Create a structure EMP consisting of elements emp\_name and emp\_number. Input the value of an employee store it in a file using fwrite. Close file. Reopen the file, and read from file using fread and display on screen all the records.
* Write a program to display a line using initgraph and line function
* Write a program to display a rectangle using differently coloured lines.
* Write a program to display circle using circle function.
* Write a program to display a pie-chart distinguished with different colors.