Assignment-5 (strings,structures & unions): -

Strings

- Implement your own functions for reading & printing strings
- Define your own functions for
  a) finding length
  b) copying
  c) concatenation
  d) comparision
  e) reversing in memory
- Study the following functions
  strncpy, strncat, strncmp, strcasecmp, strncasecmp, strchr, strrchr,strstr, strtok
- Explore the following functions used for raw memory operations.
  memcpy, memcmp, memset, bzero
- Implement your own function to convert a string having only digits into an integer and vice versa
- Write a c program to find sum & avg of command line arguments
- In a table of strings swap any two rows, when table is declared as
  a) char tstr[5][20];
  b) char *tstr[5];
- Conver the string in a.b.c.d format into 32 bit unsigned integer (use pointer operations for packing purpose)
- Write recursive functions for
  a)finding string length
  b)displaying string in reverse order
  c)to count no.of occurences of a given character
  d)finding sub string in a main string

Structures & Unions

- Create a structure for student information with the members rollno, names, marks, and perform following operations
  - Creating variables, input, output operations
  - initialization of variables
  - create a pointer of struct type, and assign address of variable
  - access members using arrow operator
  - calculate size of variable, offset of each member
  - create alias for the structure type, pointer type using typedef
- For the following structure calculate overall size, offset of each member.

  How to balance between speed, memory while using such structures.

```
struct A {
    int x;
    char c1;
    double d;
    float f;
   char c2;
    }
```

- Create a Box structure with the members length,breadth,height.Pass the structure variable to a function to calculate volume by value, by reference
  - In the student structure creatd above modify marks member as an array(array of 5 subjects), create array of struct variables and do some input,output operations.(Marks of ith student in jth subject etc)
  - Whats wrong in the following code, suggest a fix for this.

```
strcut A
{
      int x;
      char *str;
};
struct A a1 = { 101, “abc” }
```

struct A s2 = a1;

- Can a function return structure variable?Any better alternatives to this if it is possible or not.
- Create an anonymous structure, create some variables from this (with & without typedef)
- Create a nested structure, access members of inner structure from outer one.
- Bit fields

Unions:-

- Try the following code

```
union A
{
   int x;
   int y;
   char ch;
};
union A a1;
a1.x=0x10;      a1.y=0x1121;      print a1.x, a1.ch
```

- Calculate size of union , offset of members
- Convert ip address between dotted decimal format, 32 bit format using unions
- Anonymous unions, usage of typedef
- Nesting of structures, unions
  - –Union inside a structure
  - –structure inside an union etc.

Miscellaneous:-

Precision problems

- Compare some int, float, double expressions, if getting precision problems

  rectify using the condition fabs(exp1 – exp2) < 1e-5

  eg:- int x = 2; float y = sqrt(4); float z=sqrt(0.1225);

  Check correctness of comparisions like x==y , z==0.35 etc.

Buffered I/O operations

- int a,b,c;

printf(“enter two no.s\n”);

scanf(“”%d%d”,&,&b); //but here give input of 3 no.s separated by space.

printf(“ente ranother number\n”);

scanf(“%d”,&c);

printf(“%d,%d,%d\n”,a,b,c);

What do you observer, if any prob fix it using “ %d” while reading variable c

(or) use __fpurge before reading c

- char c1,c2;

  printf(“enter any character\n”);

  scanf(“%c”,&c1); //you may use getchar(c1); here

  scanf(“%c”,&c2);

  printf(“c1=%d,c2=%d\n”,c1,c2);

  fix any prob using a space before %c or using __fpurge

- int x,y;

  for(int i=1;i<=5;i++)

  {

  printf(“i=%d”,i); //dont use \n at end of printf

  y=1/(x-5);

  }

  What do you observer when you run above code.

  Try the same using \n at the end of printf or by using fflush after printf