

# MA 511: Computer Programming

## Lecture 5

[http://www.iitg.ernet.in/psm/indexing\\_ma511/y08/index.html](http://www.iitg.ernet.in/psm/indexing_ma511/y08/index.html)

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Semester 1, 2008-09

Mon 10:00-10:55 Tue 11:00-11:55 Fri 9:00-9:55 Class: 1G2

MA512 Lab : Wed 14:00-16:55

# Library Functions

**math.h** : ceil(d), floor(d), sin(d), cos(d), tan(d),  
cosh(d), exp(d), fabs(d), log(d), pow(d1,d2),...

**stdlib.h** : rand(), srand(u), abs(i), tolower(c),  
toupper(c),.....

**stdio.h** : printf(), scanf(), getchar(), putchar(),..

**string.h** : strcpy(s1, s2), strcmp(s1,s2),...

# Random number generator

```
int seed, s;  
double r;  
seed = 10000; // choose a seed value  
srand(seed); //initialize random number generator  
s=rand(); // random integer  
r=((double)rand() / ((double)(RAND_MAX)+(double)(1)));  
// random number in [0, 1)
```

Where `RAND_MAX` may be the largest positive integer the architecture can represent.

# Assignments

1. Write a c-code for generating n arbitrary (random) points in a square of size n, then identify and report which of them are placed
  - i) inside
  - ii) outside and
  - iii) on a given circle (center and radius are given as input parameters).
2. over the above given points calculate distance between all pair of points and report the maximum and minimum distances.

# Input & Output

- Following six functions permits the transfer of information between computer and standard input and output.
  - getchar, putchar, scanf, printf, gets, puts

- **getchar & putchar**

## Example

```
char c;  
printf("Enter any char value: ");  
c = getchar();  
printf("the corresponding uppercase char : ");  
putchar(toupper(c));
```

# scanf

```
scanf("%3d %3d %3d", &a, &b, &c)
```

Input: 1 2 3

Output 1 2 3

Input 123 234 456

Output 123 234 456

Input 123234345

Output 123 234 345

Input 1234 2345 5

Output 123 4 234

```
scanf("%3d, %3d, %3d", &a, &b, &c)
```

# scanf

- float f
- short ix, iy;
- long lx, ly;
- double dx, dy;
- `scanf("%4f %hd %ld %lf", &f, &ix, &lx, &dx);`
- `scanf("%3ho %7lx %15le", &iy, &ly, &dy);`

**o**: octal **x**: hexadecimal **e**: double-precision

**h**: short **l**: long

# scanf

- `char text[80];`
- `scanf(“ %[^\n]”, text);`



# printf

- float x = 123.456
- `printf(“%7f %7.3f %7.1f\n\n”, x,x,x);`
- 123.456000 123.456 123.5
  
- `printf(“%12e %12.5e %12.3e\n\n”, x,x,x);`
- 1.234560e+02 1.23456e+02 1.235e+02