Session A 04

Tuesday, 9 September 2025 9:27 AM

Loops :-

WAP program to Print 1 to 10?

```
#include<stdio.h>
int main()
{
    int x = 1;
    printf("The value of x = %d", x);
    x = x+1;
    printf("The value of x = %d", x);
    x = x+1;
    printf("The value of x = %d", x);
    x = x+1;
```

x [1] + 1

Entry controlled

```
#include<stdio.h>
int main()
{
    int x = 1;
    while (cond)
    {
        printf("The value is %d", x);
        x++;
    }
```

x = [1] 2 3 4 5 6 7 8 9 10 11

```
int addDigits(int num)
{
    while (num >= 10)
    {
        int sum = 0;
        while (num > 0)
        {
            sum = sum + (num % 10);
            num /= 10;
        }
        num = sum;
    }
    return num;
}
```

num = 573

Sum = 3+7 num = 97

Sum = 10+3 num = 0

Sum = 13 num = 13

126

621

Type	Size (bits)	Size (bytes)	Range
char	8	1	-128 to 127
unsigned char	8	1	0 to 255
int	16	2	-2^{15} to $2^{15}-1$
unsigned int	16	2	0 to $2^{16}-1$
short int	8	1	-128 to 127
unsigned short int	8	1	0 to 255
long int	32	4	-2^{31} to $2^{31}-1$
unsigned long int	32	4	0 to $2^{32}-1$
float	32	4	3.4E-38 to 3.4E+38
double	64	8	1.7E-308 to 1.7E+308
long double	80	10	3.4E-4932 to 1.1E+4932

int rev = 0;

Num = 123

while (num > 0)

{

rev = (num%10) + (rev*10);

num = num/10;

}

return (rev);

rev = 0

rev = (num%10) + (rev*10); → rev = 3 + 0

num = num/10; → 12

rev = 2 + 30

num = 1

rev = 1 + (32*10) = 321

num = num/10 → 0

① Storage Classes

② Memory Layout of Program in main Memory

char: ← 8 → Clear (unsigned) 0 to 255

0 0 0 0 0 0 0 0

1 1 1 1 1 1 1 1

⇒ 0 to 255

$2^7 + 2^6 + 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0$

$128 + 64 + 32 + 16 + 8 + 4 + 2 + 1$

char

7 6 5 4 3 2 1 0

MSB (Most Significant Bit) — LSB (Least Significant Bit)

Representation Bit: 0 +ve, 1 -ve

0 → +127

1 → -127

01111111

$2^6 + 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0$

$64 + 32 + 16 + 8 + 4 + 2 + 1$

-127 to +127 ✗ -128 to +127

-2^{n-1} to $+2^{n-1}-1$

-128 to 128-1 = 127