C Programming
Lab 6: Functions and Array

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Outline

Narcissus number

- Work out Narcissus number of 3 digits ($100 \sim 999$)
- 3 digits number satisfies: $153 = 1^3 + 5^3 + 3^3$
  1. function should be defined as 'int isNarcNum(int a)'
  2. Call it in main function to check numbers from 100 to 999
  3. Print out all Narcissus number in this range
  4. Two numbers in each line

Print out Palindrome numbers

- Define a function ?? ispld(int n)
- Judge whether number n is a palindrome number
- Define a function ?? isqr(int n)
- Judge whether number n is a square number
- Call this function in the main() function
- To print out all the Palindrome numbers in a given range [a, b]
- For example, 0, 1, 4, 9, 121, 484, 676, 10201, 12321
- Requirements
  1. Function ispld(int n) returns 1 if n is a palindrome number
  2. Otherwise return 0
  3. You should allow user to input a and b
  4. If a $\geq$ b or either of them is negative, output "invalid input!"

Convert Number String to Integer: the interface

```
1  ?? ispld(int n)
2  {
3     //filling your code here
4  }
5
6  ?? isqr(int n)
7  {
8     //filling your code here
9  }
10
11 int main()
12 {
13     int i = 0;
14     for(i = 0; i < 10000; i++)
15     {
16         //filling your code here
17     }
18     return 0;
19 }
```

Outline

Convert Number String to Integer: the problem

- Given a string char a[]="312"
- Convert it to number 312
- Put it as a function int str2num(char a[])
- General steps:

1. Calculate the length of the string
2. From lower bit to higher bit do
3. Convert each bit to number
4. Add each bit up
5. End-loop

- Hints
  1. Call int strlen(char a[]) in <string.h>
  2. Example: sz = strlen(a);

Convert Number String to Integer: the interface

```c
int str2num(??)
{
  //filling your code here
}


int main()
{
    char str[]="215";
    int num = 0;
    num  = str2num(str);
    printf("Num is: %d\n", num);
    return 0;
}
```

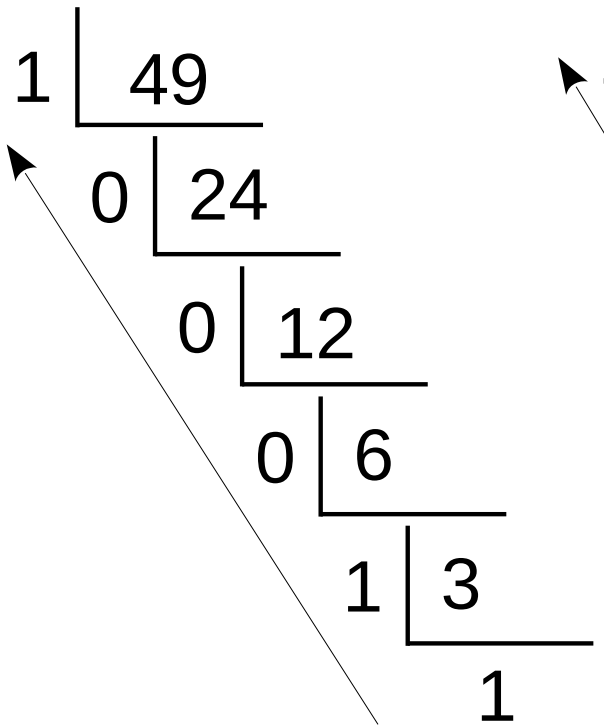
Convert Decimal to its Hexadecimal: the problem

- Given an integer: 361005
- Convert the number to its hexadecimal: 0x5822D
- Put it as a function void dec2hexa(int n)
- General steps:

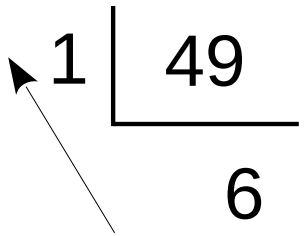
1. Divide integer n with 16 recursively
2. Keeps the modular in each time
3. End-loop
4. Map the resulting modulars to characters $'0' \sim '9', 'A' \sim 'F'$
5. Print the string inside void dec2hexa(int n)

A Friendly Reminder: decimal to hexadecimal

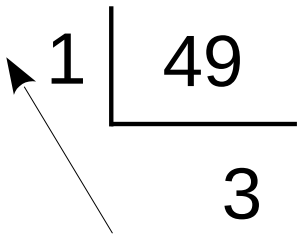
Decimal to binary



Decimal to octal



Decimal to hexadecimal



10 → A
11 → B
12 → C
13 → D
14 → E
15 → F

- Hints: define a string char hmap[] = "0123456789ABCDEF"