STUDY UNION WORK SHEET

Topics done in the first quarter of the semester:

Data types and their specifiers

Data type		Format specifier
Integer	short signed	%d or %I
	short unsigned	%u
	long singed	%ld
	long unsigned	%lu
	unsigned hexadecimal	%x
	unsigned octal	%o
Real	float	%f
	double	%lf
Character	signed character	%c
	unsigned character	%c
String		%s

%p → address

Variable naming

Q: Which of the following is a valid variable name?

a. B'day
b. int
c. $hi
d. #SI_ROCKS
e. Dot.
f. Number
g. totalArea
h. _main

i. temp_in_Deg
j. variable-name
k. nam%
l. salary

Using printf and scanf

Q: Is there an error?

1. #include <stdio.h>

```
int main()
{
int a = 56 ;
float b = 5.56;
   printf(" %d %f %d", a, b + 45, 235);

   return 0;
}
```

2. #include <stdio.h>

```
int main() {
scanf ( %d, %d , %d, a, b, c);
   return 0;
}
```

3. 8 / 2 * 5 – 6 = Number_of_coins;

4. x = (y + 5);

5. volume = a ^ 3

6. x+++;

Arithmetics

Priority	Operators	Description
1st	* / %	multiplication, division, modular division
2nd	+ -	addition, subtraction
3rd	=	assignment

Q: evaluate the following

1. res = 4 * a * y / c – a * y / c;

assume a = 4, y = 1, c = 3 and res is and integer

2. z = 3 % -8 / 2 + 7

Q: what would be the output?

```
# include <stdio.h>
int main (){

int x = 4, y, z;

y = --x;
```

```
z = x--;

printf("%d %d %d", x, y, z);

return 0;

}
```

Q: CODE

1. Lily basic salary is input through the computer. Her rent allowance is 40% of her basic salary and her mom gives her 10% of her basic salary for food. Write a program that calculates her gross income.
2. The length and breadth of a rectangle and radius of a circle are input through the keyboard. Write a program that calculates the area and perimeter of the rectangle, and the area and circumference of the circle.

   Formulas
   Area of rectangle = length * breadth
   Perimeter = 2 (l + b)
   Circumference of circle = 2 * PI * r
   Area of a circle = PI * r ^2

3. 5 digits are inputted through the keyboard. Write a program that finds the sum of each digit and reverses it.

Decision control (Boolean/logical operators, if, else, do-while….)

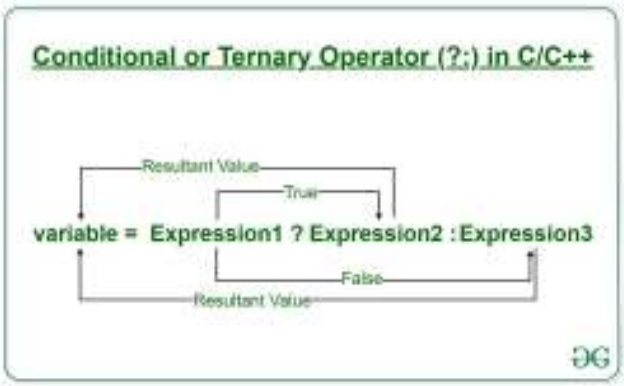
Boolean operators hierachy

Operator	Result
&	Logical AND
|	Logical OR
^	Logical XOR (exclusive OR)
||	Short-circuit OR
&&	Short-circuit AND
!	Logical unary NOT
&=	AND assignment
|=	OR assignment
^=	XOR assignment
==	Equal to
!=	Not equal to

Q: if a = 10, b = 12, c = 0, evaluate the following.

a != 6 && b > 5
a == 9 || b < 3
! (a > 5 && c)
5 && c != 8 || !c

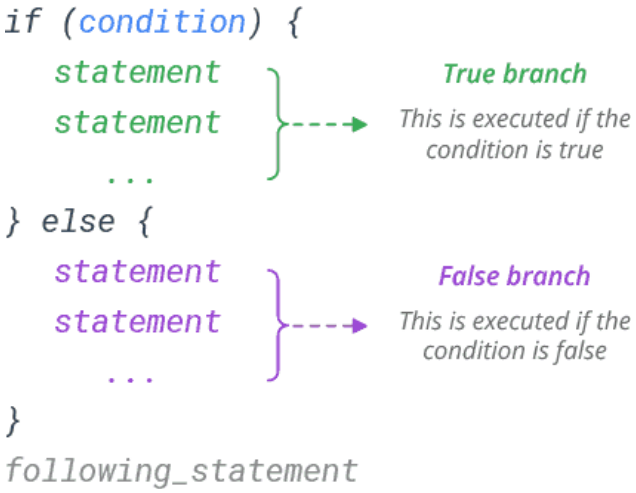
Conditional expression



Q: what would be the output

```
# include <stdio.h>
 int main (){
 int k, num = 30;
 k = (num > 5 ? (num <= 10? 100 : 200) : 500);
 printf("%d", num);
 }
```

If…else format



Q: Express the previous question using if and else.

do-while loops

- The syntax of **do-while** statement in C:

  do
  statement
  while (**loop repetition condition**);
- The *statement* is first executed.
- If the **loop repetition condition** is true, the *statement* is repeated.
- Otherwise, the loop is exited.

Q: What would be the output?

```
# include <stdio.h>
int main (){
int i = 0;

while ( i < 5);
{

Printf("HIIIIII");
```

```
}

Return 0;
}
```

Q: Change to while loop to a for loop and a do-while loop.

Functions

Q: What will be the output?

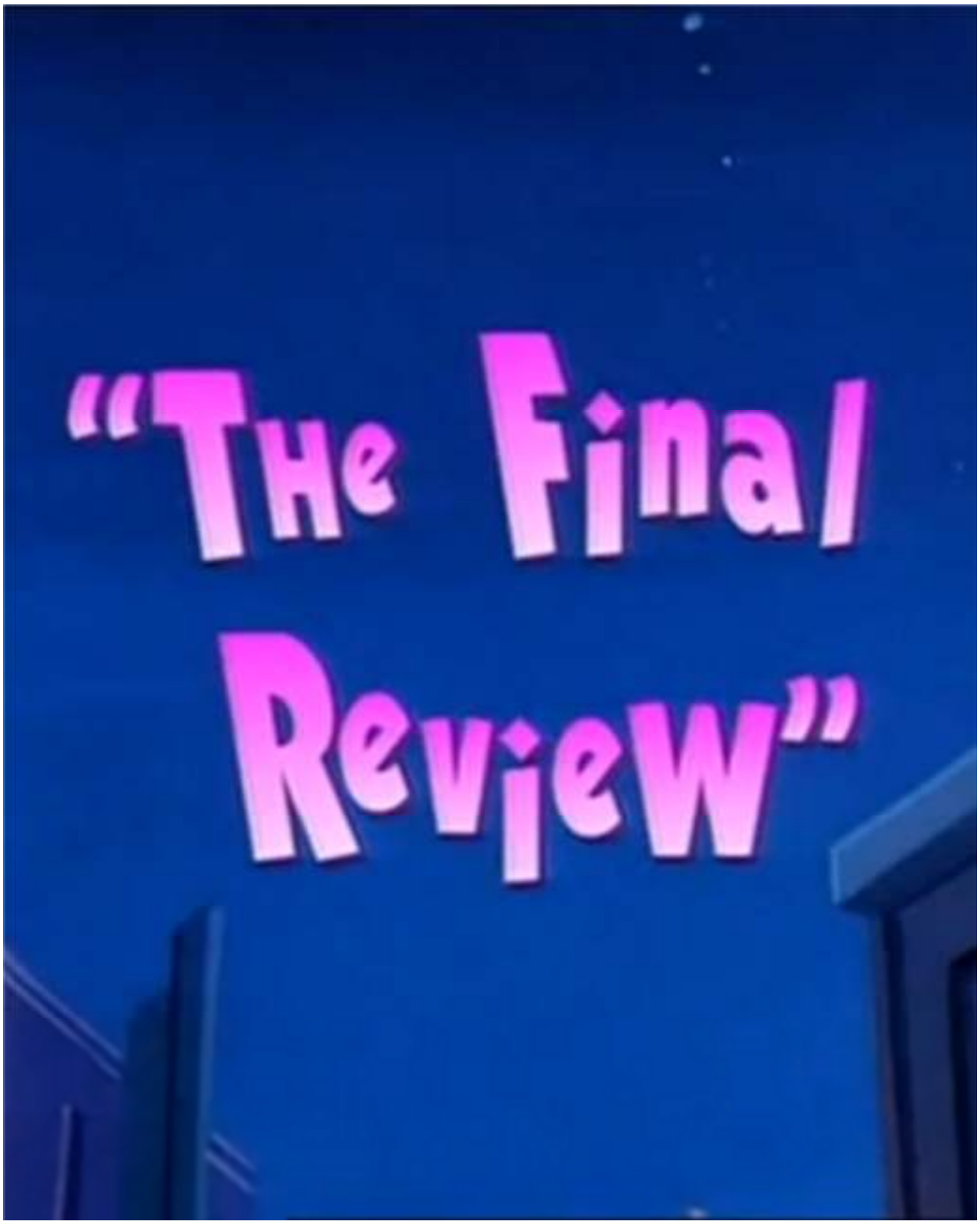
```
# include <stdio.h>
int check (int);

int main ()
{
int i = 45, c;
c = check(i);

printf("%d", c);
return 0;
}

int check (int c)
{
        if (c >= 45)
                return (100);
        else
                return (10 * 11);
}
```

1. Write a program that calculates the overtime pay for 10 employees. Overtime is $10 for every hour worked over 40 hrs.
2. Write a function that calculates the factorial value of a number entered in.
3. Write a program to compute x to the power n using while loop.


"The Final
Review"

Arrays

1. What would be the output?

```
#include <stdio.h>

int main()
{
   int num[26], temp;
   num[0] = 100;
   num[25] = 200;
   temp = num[25];
   num[25] = num[0];
   num[0] = temp;
   printf("%d %d", num[0], num[25]);


   return 0;
}
```

2. Are the array declarations correct?

```
int a(25);
int size = 10, b[size];
int c = {3, 34, 2};
```

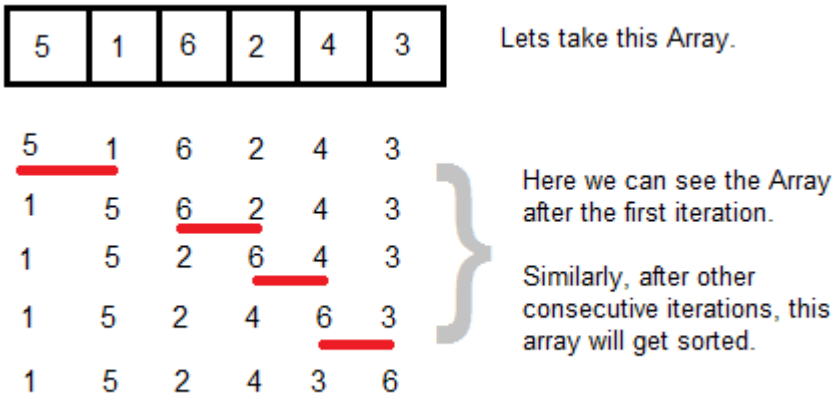
3. How many elements are stored in the array int arr[10]?

4. Write a program that takes in 10 elements to an array and a search key. You program should show the number of times the search keys is found in your array.

5. Write a program to pick the largest number in a 5 x 5 array.

Sorting

Bubble sort



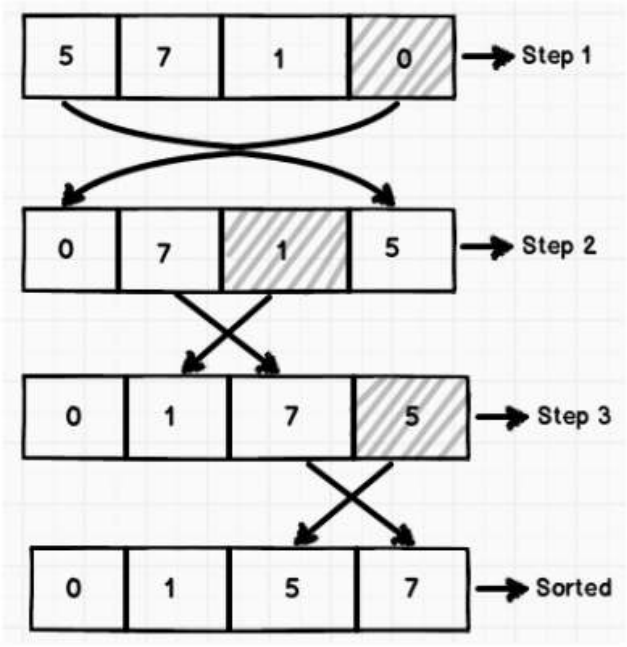
Bubble sort without pointers

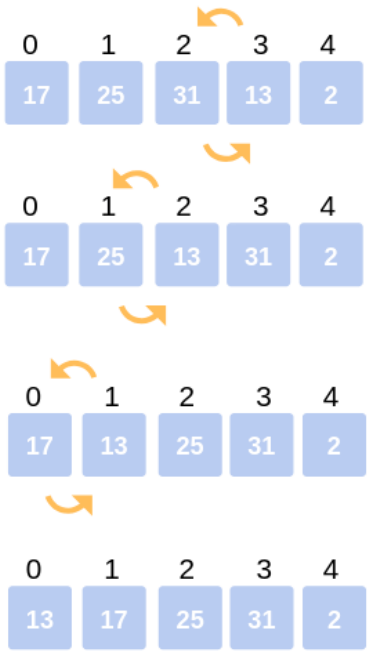
https://repl.it/@TD12/bubble-sort-without-pointers

practice question

1. Sort the numbers above using bubble sort.

Selection sort and insertion sort





1. Sort the above question using selection and insertion sort.

Pointers

1. What data type specifiers are missing in the printf statement and what will be the output?

float a = 19.34;

float *b, *c;

b = &a;

c = b;

//the address of a is 2323

printf("_____", &a, b, c);

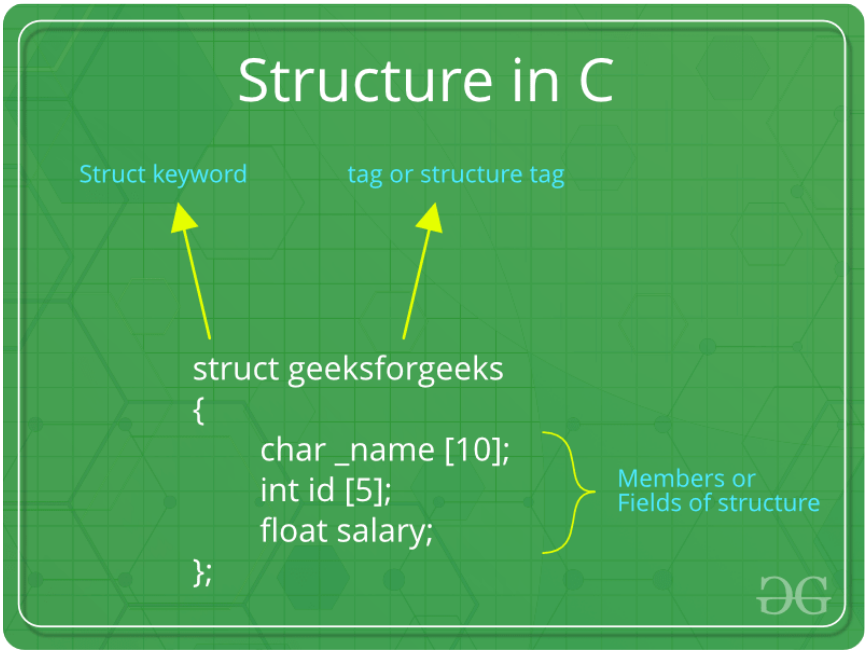
printf("_____", a, *(&a), *&a, *b, *c);

2. Match each to their answers.

```
int x[3][5] = {
                {1, 2, 3, 4, 5},
                {6, 7, 8, 9, 10},
                {11, 12, 13, 14, 15}
              }, *n = &x;
```

1.	*(*(x+2)+1)	a.	9
2.	*(*x+2)+5	b.	13
3.	*(*(x+1))	c.	4
4.	*(*(x)+2)+1	d.	3
5.	*(*(x+1)+3)	e.	2
6.	*n	f.	12
7.	*(n+2)	g.	14
8.	(*(n+3)+1	h.	7
9.	*(n+5)+1	i.	1
10.	++*n	j.	8
		k.	5
		l.	10

Structures



1. All memory in a structure are stored in a continuous memory. True or False.
2. Would you prefer to store 10 floats in an array or structure?
3. What will be the output of the C program?

```
#include<stdio.h>

struct {

    int i;

    float ft;

}decl;

int main()

{

    decl.i = 4;

    decl.ft = 7.96623;

    printf("%d %.2f", decl.i, decl.ft);

    return 0;

}
```

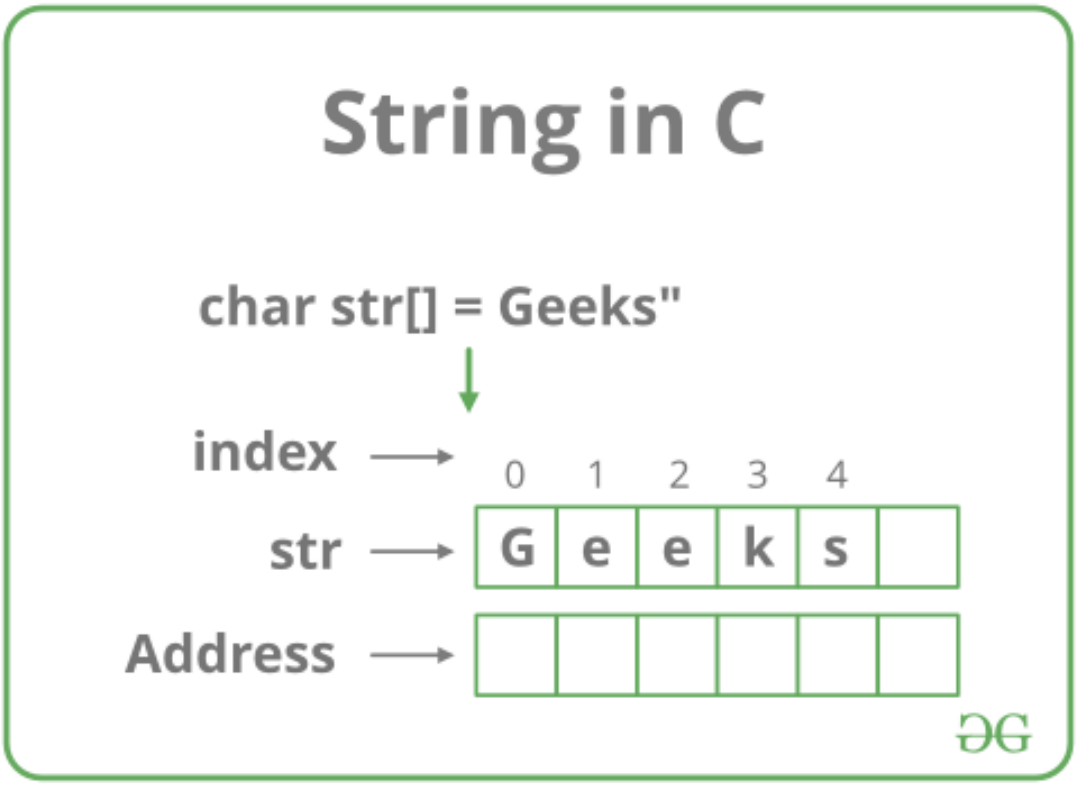
A. 4 7.97

B. 4 7.96623

C. Compilation error

D. None of the above

Strings



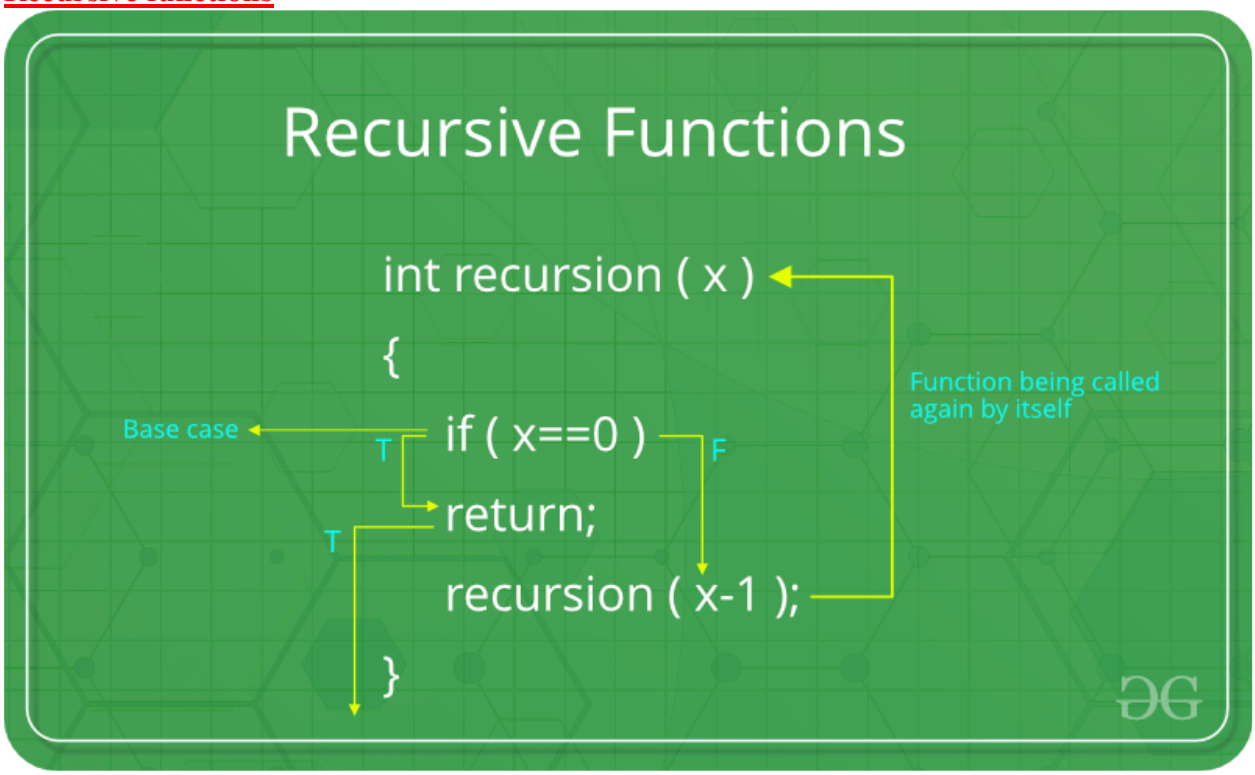
1. “A” is a _____ while ‘A’ is a _____.
2. Strings are terminated with a _____.

Files I/O

Function Name	Operation
fopen()	Creates a new file for use
	Opens a new existing file for use
fclose	Closes a file which has been opened for use
getc()	Reads a character from a file
putc()	Writes a character to a file
fprintf()	Writes a set of data values to a file
fscanf()	Reads a set of data values from a file
getw()	Reads a integer from a file
putw()	Writes an integer to the file
fseek()	Sets the position to a desired point in the file
ftell()	Gives the current position in the file
rewind()	Sets the position to the beginning of the file

1. Write a program to print out the content of a file and create an output file.
2. The FILE structure is defined in which file?
3. Write a function that store the name and roll no of 2 students in a structure, prints it out to a file and onto the terminal.

Recursive functions



1. What would be the output?

```
#include <stdio.h>

int fun1(int x, int y)
{
  if(x == 0)
    return y;
  else
    return fun1(x - 1,  x + y);
}

int main()
{
    printf("%d", fun1(3,2));
    return 0;
}
```

Note that these don't cover everything that will be on your quiz, so make sure you take a look at the material in the lectures and textbook, too. The above materials do not belong to me.

How to study

1. Go over the slides
2. Practice questions
3. Redo the assignments