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COMP301 Fall 2022 : Lab 2: C Language Basics – If else, loops and arrays

~~~~~~~~~~~~~~<u>Sample Code (compile and run the following code and answer the questions)</u>~~~~~~~~~~~~~~

```c
#include<stdio.h>

int main(){
//If Else Example
  float fever;
  printf("\nPlease enter your temperature: ");
  scanf("%f",&fever);
  if(fever>98.6) {
      printf("You have a high fever\n");
      printf("Take some medicine\n\n");
  }
  else if(fever==98.6)
      printf("Your temperature is normal\n\n"); //Line A
  else
      printf("Your temperature is low\n\n");    //Line B
```

//What is the meaning of the keyword "float" and why is it used?

float is a data type with size = 4 Bytes. It is used to store values having decimal parts.

//Can Line A and Line B execute at the same time? Why or why not?

They both can't be executed at the same time because of if/else statement. if temp == 98.6 then it is A will be printed, if below than 98.6 the B will be printed.

```c
//For Loop Example
  printf("Even numbers from 0 to 10 are: ");
  for(int i=0; i<=10; i+=2) {   //for loop heading "int i=0; i<=10; i+=2"
      //i+=2   same as i=i+2
      printf("%d", i);
      if(i!=10) printf(", ");   //Line C
  }
```

//Explain the 3 parts which are separated by semicolons inside the for() loop heading

(Int i=0) → variable initialised   (i<=10) → value compared after every iteration
(i+=2) → value incremented by 2 after every iteration.

//referring to Line C, is it allowed in C to write the body of the loop (printf) on the
//same line as the condition?

Yes, it is allowed, spaces or placement doesn't matter in C. Only semicolons (;)

//When are we allowed to omit the braces {} from the body of **if** or **for**

if we have only one statement after if or for loop, it will run fine without braces.

```c
//List or Array Example
  int list[5]={18,9,45,36,90};
  char name[8]={"Abdullah"};    //Line D
  printf("\n\n3rd element of list is %d\n",list[2]);
  printf("6th element of array name is %c\n",name[5]);
  printf("The complete string name is %s\n",name);
```

Name _____ Roll No. _____ Date_____

```
//Do we have to specify what type of elements are going to be there in the array? How?
```

Yes, we need to specify the array type. Only those types are allowed then.

```
//what is difference in %c and %s?
```

%c → is used to read single character in input stream
%s → is used to read every character until EOF, whitespace or '\n'.

//While Loop Example
```
  int j=2, FibonacciCount=10-2, f[10]; //list or array to hold Fibonacci numbers
  f[0]=0; f[1]=1;
  printf("\nFirst 10 Fibonacci Numbers are: ");
  printf("%d, %d", f[0], f[1]);
  while(j<FibonacciCount){//Line E
    f[j]=f[j-1]+f[j-2];
    printf(", %d", f[j]);
    j++;
  }
  printf("\n\n");
  return 0;
}
```

```
//How many times will be the while loop condition on Line E checked/executed and why?
```

6 times because as long as j < count (10-2), loop will run; incrementing j.

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Task:
- Write a gcc C program: compile and run in Ubuntu. Create an array "zeta" of size 30 that holds floating point numbers. The first 3 elements are 1.1, 2.2, 3.3. The nth element is calculated using the expression:
$$zeta(n) = 0.5 * zeta(n-3) + 0.3 * zeta(n-2) + 0.2 * zeta(n-1)$$
- Use a loop to print the complete array of 30 elements, each value separated by comma.
- On the next line of the output, the program should print only the numbers in the array that have odd integer part.
    - (The integer part of the number 123.456 is 123.)