C Programming

Intro

main.c

```
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  int main() {
5
6      printf("Hello world");
7
8      return 0;
9  }
10
```

Preprocessor Directories

Mertheod/ Function

Code Commenting

```
// Single line
/*Multiline
Line 1
Line 2
*/
```

Syntax > // comment

Syntax > /* Comment */

Data Types

int : Integer datatype is used to handle the numbers without decimal points.
float : This datatype is used to handle the numbers with decimal points
double : This datatype is used to handle the numbers with decimal points
char : This datatype is used to handle the characters (only 1 character)

```
#include <stdio.h>
#include <stdlib.h>

int main() {

    int num = 10
    float num2 = 12.34
    char c = 'a'
    double num3 = 1.2E04

    return 0;
}
```

```
int num1 = 5;          double num4 = 987.2324E2E4;
int num2 = -10;        double num5 = -123.1324E5E6E7;
int num3 = 3174;       double num6 = 2932E3;
long int num4 = 2L;
long long int num5 = 4LL;
float num1 = 92.4sdc;  char char1 = '4';
float num2 = -156.25;  char char2 = 'W';
```

char[] - Like a string value

```
char name[] = "my name";
```

Variables

A memory location in the program that can store a value

Syntax

```
Datatype  Variable_name  =  Value  ;
```

Q. Create an integer variable named number and assign a value of 10

```
#include <stdio.h>

int main() {

    int number = 10;

    return 0;
}
```

Format Specifiers

Format specifiers are used when printing values or taking inputs from user

int	%d
float	%f
double	%lf
char	%c

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

    int number = 76;

    printf("Number %d", number);

    return 0;
}
```

using %d format Specifier

T.S. Samples

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    int age = 19;

    printf("%d, I am %d", age);

    return 0;
}
```

Printing Age

```
#include <stdio.h>
#include <stdlib.h>

int main()
{
    float batch = 19.5;

    printf("%f, I am %f", batch);

    return 0;
}
```

Printing batch

Printing String variable in c

%s - string
use this when prinig a character arrays (char name[])

```
#include <stdio.h>

int main() {

    char name[] = "Kavehan";

    printf("My name is %s", name);

    return 0;
}
```

Data Input

Syntax

```
scanf("format_specifier", &variable);
scanf("%d", &num2);
```

Example

```
#include <stdio.h>

int main() {

    int age = 20;

    printf("%d", age);

    printf("My age is %d", age);

    return 0;
}
```

User Input

```
#include <stdio.h>

int main() {

    int age = 20;

    printf("Enter your age: ");

    scanf("%d", &age);

    printf("My age is %d", age);

    return 0;
}
```

More clear for the user

Line break character "\n"

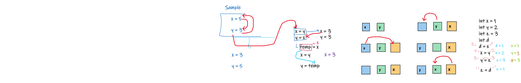
```
printf("Enter your age: \n");
```

Q. Write a program to input two numbers and display
1. The numbers input by the user.

```
#include <stdio.h>

int main() {
    int x;
    int y;

    printf("Enter the first value: ");
    scanf("%d", &x);
    printf("Enter the second value: ");
    scanf("%d", &y);

    printf("The numbers you have entered %d for x and %d
           for y", x, y);
}
```

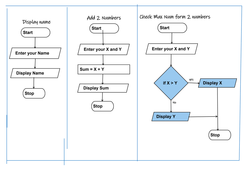
2. Swap the numbers and display the output.

Sample



Flow Chart

Used to describe the flow of a program



Q. Ask the user for the birth year and calculate the age

```
#include <stdio.h>

int main() {
    int b_year;
    int c_year = 2022;
    int age;

    // ask user for the birth year
    printf("Enter your Birth Year ");
    scanf("%d", &b_year);

    // process block
    age = c_year - b_year;

    // output block
    printf("Your age is %d", age);

    return 0;
}
```

Control Structures

Order of Execution

1. Sequence
2. Selection
3. Iteration (Repetition)

Sequence

Statements are executed as for the given order

Selection

* If - else
* Switch

If - Else

Syntax	Description	Sample
>	Larger than	10 > 1
<	Less than	1 < 10
==	Equal	1 == 1
!=	not Equal	1 != 2
>=	Larger than or Equal	10 >= 11 10 >= 10
<=	Less than or Equal	1 <= 10 1 <= 1
&&	AND	(condition) && (condition)
||	OR	(condition) || (condition)
!	NOT	!(condition)

```
#include <stdio.h>

int main() {
    // Variable declaration
    int num = 0;

    // if-else-if-else-if-else-
```