2 applications of c programming?

1. operating systems; 2, embedded systems. 3, system software, 4, game development, 5, Database systems, 6, high-performance applications, 7, computer networks, 8, compilers & Language interpreters, 9, Desktop applications, 10, cloud & Distributed systems.

Example c program:-

```
#include <stdio.h>
int main()
{
  printf("Hello, word!");
  return 0;
}
```

3 what is variable?

A variable in programming is a named storage location in memory that holds a value, which can change during program execution.

simple definition:-

A variable is a container that stores data for use in a program.

Example in c:-

```
c
int age = 20;
```

here...

int → data type

age → variable name

20 → value stored in the variable.

Key points:-

A variable has a name, types & value.

The value stored in a variable can be updated.

1. what is c Language?

Ans

c is a general-purpose procedural programming language created by Dennis Ritchie in the early 1970s at Bell Labs it is one of the most influential languages in computing

* Key features of c.

fast & efficient → close to hardware, minimal runtime overhead.

portable → c programs can run on many different system with little change.

procedural → focuses on step-by-instructions.

Low-level access → allows working with Memory directly using pointers

foundation for many languages → c++, c# java, Rust, Go & others are influenced by c

-; Example c program;-

```
#include <stdio.h>
int main() {
    printf("Hello, world");
    return 0;
}
```

if you want, I can help you learn c from the basics, explain topics, or help you write code!

The compiler uses the variable's data type to decide how much memory to allocate.

4 What are different data types in c programming.

In c programming data types specify the type of data a variable can store & how much memory it uses.

Here are the main categories:

1: Primary [Basic] Data types.

Data type	Description	Example
int	stores integers	5, 12
float	stores decimal number [single precision]	3.14
double	Decimal number [double precision, more accurate]	12.5678
char	stores a single character	'A', '5'

2 Derived Data types:

Array → collection of elements of the same type.

pointer → stores address of another variable

structure → Group of different types.

union → similar to struct but shares memory

function → Block of reusable code.

3 enumeration data type.

enum → user-defined type with named integral constants.

4 void Data type:-

void → means "no value" or empty (used in function)

5 what is format specifier.

int	%d or %i	printf("%d", age);
float	%f	printf("%f", price);
double	%lf	printf("%lf", amount);
char	%c	printf("%c", letter);
string (char array)	%s	printf("%s name");
Long int	%ld	
Long Long int	%lld	
Usigned int	%u	
hexadecimal	%x or %X	
octal	%o	

Example using format specifiers.

```
int age = 20;
float salary = 4500.50;
char grade = 'A';

printf("age %d\n", age);
print f("salary %.2f\n", salary);
printf("grade %c\n", grade);
```

why format specifiers are important.

- Ensure the correct output format
- prevent errors when printing / reading variables.
- allow formatting like precision (%.2f) width, alignment etc.