

16 Lecture - CS201

Important Subjective

1. What is a pointer variable? Give an example of declaring a pointer variable in C.
Answer: A pointer variable is a variable that stores the memory address of another variable.
Example of declaring a pointer variable in C:

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```
int *ptr;
```

2. What is the difference between declaring a pointer variable and initializing a pointer variable?
Answer: Declaring a pointer variable means specifying its type and name. Initializing a pointer variable means assigning a value (i.e., a memory address) to it.
3. What is the difference between pointer arithmetic and normal arithmetic?
Answer: Pointer arithmetic is performed on memory addresses, whereas normal arithmetic is performed on values. In pointer arithmetic, the value of a pointer is incremented or decremented based on the size of the data type that it points to.
4. How do you allocate memory dynamically using the malloc() function in C?
Answer: The malloc() function is used to dynamically allocate memory in C. It takes one argument, which is the size of the memory block to be allocated (in bytes). For example:

c

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```
int *ptr = (int *) malloc (sizeof int );
```

5. What is a null pointer in C?
Answer: A null pointer is a pointer that does not point to any memory address. In C, it is represented by the value 0 or NULL.
6. What is a function pointer in C? Give an example of declaring a function pointer.
Answer: A function pointer is a pointer that points to the memory address of a function. Example of declaring a function pointer:

c

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```
int (*ptr)(int, int);
```

7. What is the difference between a void pointer and a null pointer?

Answer: A void pointer is a pointer that points to memory of any data type, whereas a null pointer is a pointer that does not point to any memory address.

8. How do you use the "->" operator in C to access a member of a structure through a pointer?

Answer: The "->" operator is used to access a member of a structure through a pointer. For example:

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```
struct student { char name[50]; int age; }; struct student *ptr; ptr->age = 20;
```

9. What is a double pointer in C? Give an example of declaring a double pointer.

Answer: A double pointer is a pointer that points to the memory address of another pointer. Example of declaring a double pointer:

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```
int **ptr;
```

10. What is the difference between passing a variable by value and passing it by reference in a function call?

Answer: When a variable is passed by value, a copy of its value is passed to the function, whereas when it is passed by reference, a reference to its memory address is passed to the function. This means that any changes made to the variable inside the function will affect the original variable when passed by reference, but not when passed by value.