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QUESTION:

a.) The CPU handle the request from various devices connected to the system like keyboard, mouse, scanner, printer etc. Whenever a new system arrives, its priority is compared with the priority of request made already and put into a wait list in order of the priority. Evaluate such an environment in C using suitable data structure and explain how the request are handled. Consider the following levels of priority Keyboard -1, mouse-2, Scanner-3, Printer-4, with 1 being the highest and 4 having the lowest priority.

ANSWER

This in C environment the suitable data structure is Queue and the request will be handled as follow:

The System determines the the priority of each new request before adding it to the list in queue the one with the highest priority will be pushed at the position one in the front of the queue and that with lowest priority will be placed at the end of the queue or rear.

Example: index 0 → Keyboard

index 1 → mouse

index 2 → Scanner

index 3 → Printer

b.) Write a routine to insert an element in a stack using linked list with a neat diagram.

ANSWER

1. Create a new node.
2. Add data to the new node.
3. If the stack is empty head is Null set the new node's next to Null and update head to the new node.
4. If the stack is not empty head is not equal to Null set the new node's next to head, and update head to the new node.

c.) Consider the following infix expression $((a+b)^{(c/d)*e})$ and convert it into postfix expression using the values $a=2, b=6, c=3, d=2$ and $e=-2$ using stack.

ANSWER

d.) Write a program to perform deposit and withdraw operations in a bank account using functions.

ANSWER

```
#include <stdio.h>

int balance = 0;

void deposit(int amount) {
    balance += amount;
    printf("Deposited: %d\n", amount);
}

void withdraw(int amount) {
    if (amount > balance) {
        printf("Insufficient funds\n");
    } else {
        balance -= amount;
        printf("Withdrawn: %d\n", amount);
    }
}

int main() {
    deposit(500);
    withdraw(300);
    printf("Final Balance: %d\n", balance);
    return 0;
}
```

OUTPUT

```
astro@pop-os:~/Study/D Programm$ nano bank.c
astro@pop-os:~/Study/D Programm$ gcc bank.c -o bank
astro@pop-os:~/Study/D Programm$ ./bank
Deposited: 500
Withdrawn: 300
Final Balance: 200
astro@pop-os:~/Study/D Programm$
```

e.) Write the suitable routine and explain with example the following operations of linked list.

I. Insertion at the beginning

ANSWER

- First the new node is created
- Then the data will be added at the data node position if the element is the first element the node next will be the head
- If the element is not the first element this done by checking if the head is not empty then new node next will be head and the head updated to be the new node.

II. Insertion at the beginning

ANSWER

- First the new node is created
- Then the head will be checked if is empty if is empty the insertion operation will be as the front insertion operation.
- If the head is not empty then the temp will be created to transverse the list through loop to find the temp next which is Null then temp will be temp next and the loop will finish and temp next will be equal to the new node.