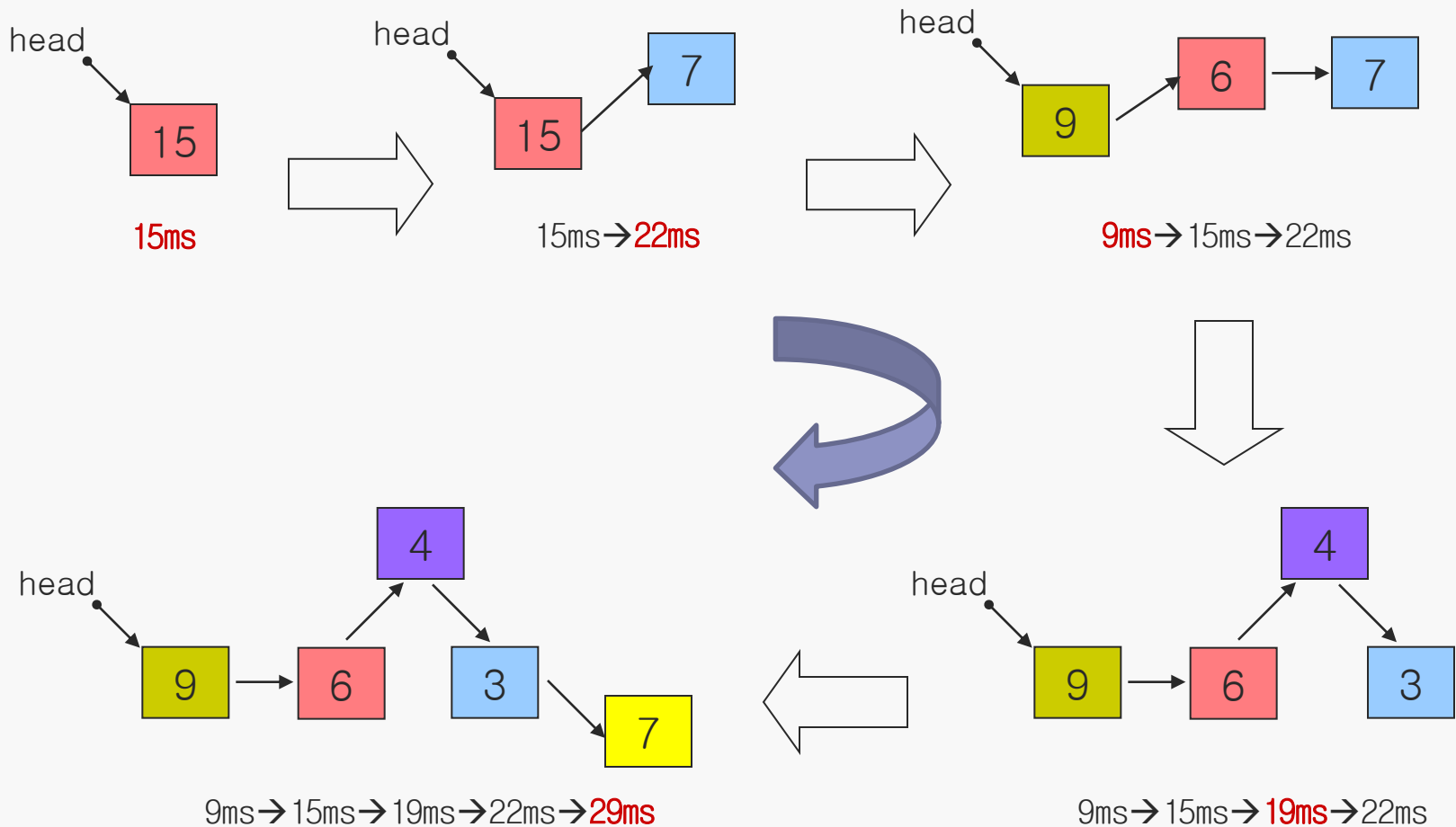


Project #10(Pjt10_timer_linked_list)

◆ Linked List with Cumulative Remaining Time(Timer List)



Project #10(Pjt10_timer_linked_list)

◆ Linked List for Software Callback Timer : Header File

```
struct task {  
    void    (*fun)(void *);  
    char    arg[8];  
};
```

```
struct timer { // node for timer  
    int    time;  
    struct task    task;  
    struct timer    *link;  
};
```

```
extern struct timer *Thead;  
void    insert_timer(struct task *tskp, int ms);  
struct timer *get_timer();  
void    tour_timer(), free_timer();
```

```
struct timer *get_timer()  
{  
    struct timer *tp;  
  
    tp = (struct timer *)malloc(sizeof(*tp));  
    return(tp);  
}
```

Project #10(Pjt10_timer_linked_list)

◆ Linked List for Software Callback Timer

```
struct timer *Thead = NULL;
void insert_timer(struct task *tskp, int ms)
{
    int          total;
    struct timer *tp, *cp, *pp;

    tp = get_timer();
    tp->task = *tskp;
    tp->time = ms;

    if (Thead == NULL) {
        Thead = tp, tp->link = NULL;
        return;
    }
    pp = NULL, total = 0;
    for (cp = Thead; cp; cp = cp->link) {
        total += cp->time;
        if (total >= ms)
            break;
        pp = cp;
    }
    if (pp == NULL) {
        cp->time -= tp->time;
        tp->link = cp, Thead = tp;
    }
    else if (cp == NULL) {
        tp->time -= total; // pp->time
        pp->link = tp;
        tp->link = NULL
    }
    else {
        total -= cp->time; // just before
        tp->time -= total;
        cp->time -= tp->time;
        pp->link = tp;
        tp->link = cp;
    }
}
```

Project #10(Pjt10_timer_linked_list)

◆ Data Structure for Software Timer(Linked List)

```
void tour_timer()
{
    struct timer *cp;
    int    total = 0;

    printf("Wn")
    for (cp = Thead; cp != NULL; cp = cp->link) {
        total += cp->time;
        printf("-->%d(%d) ", cp->time, total);
    }
    printf("Wn")
}

void free_timer()
{
    struct timer *cp;

    for ( ; Thead != NULL; ) {
        cp = Thead;
        Thead = cp->link;
        free(cp);
    }
}
```

Project #10(Pjt10_timer_linked_list)

◆ Sample Task to Test Timer Linked List

```
void app_timer(char *ap)
{
    char          buf[8];
    int           ms;
    struct task    tsk;

    while(1) {
        printf(">> ");
        if (fgets(buf, 8, stdin) == NULL || (ms = atoi(buf)) == 0)
            break;

        insert_timer(&tsk, ms);
    }
    tour_timer();
    free_timer();
}
```

Project #10(Pjt10_timer_linked_list)

◆ Sample Task to Test Linked List

```
void app_list(char *ap)
{
    char          buf[8], how =  'a';
    struct node *np;

    if (ap) how = *ap;
    while(1) {
        printf("> ");
        if (fgets(buf, 8, stdin) == NULL)
            break;
        np = get_node();
        np->data = buf[0];    // use only the first character in buf
        switch(how) {
            case 'h' : insert_node_head(np); break;
            case 't' : insert_node_tail(np); break;
            default : insert_node_ascn(np); //  'a'
        }
    }
    tour_list();
    free_list();
}
```

Project #10(Pjt10_timer_linked_list)

```
int is_prime(int n)
{
    int i;
    for (i = 2; i <= n/2; i++)
        if ((n % i) == 0)
            return(0);
    return(1);
}

void app_prime(char *ap)
{
    int n = 2000, count = 0;

    if (ap) n = atoi(ap);
    for (n = 2; n <= t; n++) {
        if (is_prime(n)) {
            count++;
            printf("%d is a prime number !!!Wn", n);
        }
    }
    printf("count=%dWn", count);
}
```

Project #10(Pjt10_timer_linked_list)

```
#include <stdio.h>
#include <string.h>
main()
{
    char  cmd[128], *cp, *ap;
    int   n = 0;

    uart_init();
    sei();
    while(1) {
        printf( "$ " );
        if (fgets(cmd, sizeof(cmd), stdin) == NULL)
            break;
        if ((cp = strtok(cmd, "WnWrWt ")) == NULL) continue
        ap = strtok(NULL, "WnWrWt ");
        if      (!strcmp(cp, "prime" )) app_prime(ap);
        else if (!strcmp(cp, "list"  )) app_list(ap);
        else if (!strcmp(cp, "timer" )) app_timer(ap);
        else
            printf( "Unknown command...Wn" );
    }
    printf( "logout, good bye !!!Wn" );
    while(1);
}
```