```cpp
#include <iostream>

#define first(L) (L).first
#define next(p) (p)->next
#define info(p) (p)->info

using namespace std;

struct infotype {
    string artis, judul, genre;
    int playtime;
};

typedef struct element *adr;

struct element {
    infotype info;
    adr next;
};

struct listLagu {
    adr first;
};

void createList_1301213232(listLagu &L);
void createElement_1301213232(infotype lagubaru, adr &pLagu);

void insertLast_1301213232(listLagu &L, adr pLagu);
void deleteFirst_1301213232(listLagu &L, adr &pLagu);


void showSemuaLagu_1301213232(listLagu L);
```

```cpp
#include "CLL.h"

void createList_1301213232(listLagu &L) {
    first(L) = NULL;
}


void createElement_1301213232(infotype lagubaru, adr &pLagu) {
    pLagu = new element;
    info(pLagu) = lagubaru;
```

```cpp
        next(pLagu) = NULL;
}


void insertLast_1301213232(listLagu &L, adr pLagu) {
    if (first(L) == NULL) {
        first(L) = pLagu;
        next(pLagu) = first(L);
    } else {
        adr p = first(L);
        while (next(p) != first(L)) {
            p = next(p);
        }
        next(p) = pLagu;
        next(pLagu) = first(L);
    }
}


void deleteFirst_1301213232(listLagu &L, adr &pLagu) {
    if (first(L) != NULL) {
        pLagu = first(L);

        adr lastElement = first(L);
        while (next(lastElement) != first(L)) {
            lastElement = next(lastElement);
        }
        first(L) = next(first(L));
        next(lastElement) = first(L);
        next(pLagu) = NULL;
    }
}


void showSemuaLagu_1301213232(listLagu L) {
    adr p = first(L);
    do {
        cout << "Lagu: " << info(p).judul << " (" << info(p).genre << ") " << "- "
<< info(p).artis << " - Played " << info(p).playtime << " times." << endl;
        p = next(p);
    } while (p != first(L));
}
```

main.cpp

```cpp
#include "CLL.h"

// helper
infotype createInfo(string artis, string genre, string judul, int playtime) {
    return infotype {artis, judul, genre, playtime};
}

int main()
{
    listLagu songs;
    adr song, out;

    createList_1301213232(songs);

    // createElement_1301213232(createInfo("Avenged Sevenfold", "Rock", "M.I.A", 0),
song);
    // insertLast_1301213232(songs, song);

    // createElement_1301213232(createInfo("Jason Mraz", "Pop", "Im Yours", 0),
song);
    // insertLast_1301213232(songs, song);

    // createElement_1301213232(createInfo("Joo Won", "Pop", "Fly Me To the Moon",
0), song);
    // insertLast_1301213232(songs, song);

    for (int i = 0; i < 12; i++) {
        createElement_1301213232(createInfo("Avenged Sevenfold", "Rock", "M.I.A",
i+1337), song);
        insertLast_1301213232(songs, song);
    }

    showSemuaLagu_1301213232(songs);
    cout << endl;

    for (int i = 0; i < 3; i++) {
        deleteFirst_1301213232(songs, out);
        cout << "Deleting " << info(out).judul << " song that you've played " <<
info(out).playtime << " times." << endl;
    }

    cout << endl;
```

```
    showSemuaLagu_1301213232(songs);


    return 0;
}
```

```
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1337 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1338 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1339 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1340 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1341 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1342 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1343 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1344 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1345 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1346 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1347 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1348 times.

Deleting M.I.A song that you've played 1337 times.
Deleting M.I.A song that you've played 1338 times.
Deleting M.I.A song that you've played 1339 times.

Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1340 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1341 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1342 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1343 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1344 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1345 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1346 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1347 times.
Lagu: M.I.A (Rock) - Avenged Sevenfold - Played 1348 times.
```