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#include <stdio.h>
#include <string.h>

#define MAX_COMPONENTS 50
#define MAX_BOXES 3

struct Component {
    char name[50];
    int working;
    int boxIndex; // 0 - Sensors, 1 - Important Box, 2 - Microcontroller Box
};

void initializeInventory(struct Component components[], int *numComponents);
void printInventory(struct Component components[], int numComponents);
void storeInBox(struct Component components[], int *numComponents);
void printBoxContents(struct Component components[], int numComponents, int boxIndex);
void printAllComponents(struct Component components[], int numComponents);
void moveComponent(struct Component components[], int numComponents);
void searchComponent(struct Component components[], int numComponents);

int main() {
    struct Component components[MAX_COMPONENTS];
    int numComponents = 0;

    initializeInventory(components, &numComponents);

    int choice;
    do {
        printf("\n------------------------\n");
        printf("    Inventory System\n");
        printf("------------------------\n");
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        printf("1. Print Inventory\n");
        printf("2. Store Component in Box\n");
        printf("3. Print Box Contents\n");
        printf("4. Print All Components\n");
        printf("5. Move Component to Another Box\n");
        printf("6. Search for a Component\n");
        printf("7. Exit\n");

        printf("Enter your choice: ");
        scanf("%d", &choice);

        switch (choice) {
            case 1:
                printInventory(components, numComponents);
                break;
            case 2:
                storeInBox(components, &numComponents);
                break;
            case 3:
                printf("Select the box to print contents (1 - Sensors, 2 - Important Box, 3 - Microcontroller
Box): ");
                int boxChoice;
                scanf("%d", &boxChoice);
                if (boxChoice >= 1 && boxChoice <= MAX_BOXES) {
                    printBoxContents(components, numComponents, boxChoice - 1);
                } else {
                    printf("Invalid box selection.\n");
                }
                break;
            case 4:
                printAllComponents(components, numComponents);
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            break;
        case 5:
            moveComponent(components, numComponents);
            break;
        case 6:
            searchComponent(components, numComponents);
            break;
        case 7:
            printf("Exiting the program. Thank you!\n");
            break;
        default:
            printf("Invalid choice. Please try again.\n");
      }

   } while (choice != 7);

   return 0;
}

void initializeInventory(struct Component components[], int *numComponents) {
   // Initialize some sample components
   strcpy(components[*numComponents].name, "Sensor1");
   components[*numComponents].working = 1;
   components[*numComponents].boxIndex = 0; // Sensors box
   (*numComponents)++;

   strcpy(components[*numComponents].name, "ImportantComponent");
   components[*numComponents].working = 0;
   components[*numComponents].boxIndex = 1; // Important Box
   (*numComponents)++;
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    // Add more components as needed
}

void printInventory(struct Component components[], int numComponents) {
    printf("\n------------------------\n");
    printf("       Inventory\n");
    printf("------------------------\n");
    printf("Component Name     Working     Box Index\n");
    for (int i = 0; i < numComponents; i++) {
        printf("%-20s%-12s%d\n", components[i].name,
               components[i].working ? "Yes" : "No",
               components[i].boxIndex);
    }
}

void storeInBox(struct Component components[], int *numComponents) {
    if (*numComponents < MAX_COMPONENTS) {
        printf("Enter the component name: ");
        scanf("%s", components[*numComponents].name);

        printf("Is the component working? (1 - Yes, 0 - No): ");
        scanf("%d", &components[*numComponents].working);

        printf("Select the box to store the component (1 - Sensors, 2 - Important Box, 3 - Microcontroller
Box): ");
        scanf("%d", &components[*numComponents].boxIndex);

        if (components[*numComponents].boxIndex >= 1 && components[*numComponents].boxIndex
<= MAX_BOXES) {
            printf("Component stored in the selected box.\n");
            (*numComponents)++;
        } else {
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            printf("Invalid box selection. Component not stored.\n");
        }
    } else {
        printf("Inventory is full. Cannot add more components.\n");
    }
}

void printBoxContents(struct Component components[], int numComponents, int boxIndex) {
    printf("\n------------------------\n");
    printf("    Box Contents\n");
    printf("------------------------\n");
    printf("Component Name     Working\n");
    for (int i = 0; i < numComponents; i++) {
        if (components[i].boxIndex == boxIndex) {
            printf("%-20s%-12s\n", components[i].name,
                   components[i].working ? "Yes" : "No");
        }
    }
}

void printAllComponents(struct Component components[], int numComponents) {
    printf("\n------------------------\n");
    printf("   All Components\n");
    printf("------------------------\n");
    printf("Component Name     Working     Box Index\n");
    for (int i = 0; i < numComponents; i++) {
        printf("%-20s%-12s%d\n", components[i].name,
               components[i].working ? "Yes" : "No",
               components[i].boxIndex);
    }
}
```

```
void moveComponent(struct Component components[], int numComponents) {
    printf("Enter the component name to move: ");
    char componentName[50];
    scanf("%s", componentName);

    int componentIndex = -1;
    for (int i = 0; i < numComponents; i++) {
        if (strcmp(components[i].name, componentName) == 0) {
            componentIndex = i;
            break;
        }
    }

    if (componentIndex != -1) {
        printf("Select the destination box (1 - Sensors, 2 - Important Box, 3 - Microcontroller Box): ");
        int boxChoice;
        scanf("%d", &boxChoice);
        if (boxChoice >= 1 && boxChoice <= MAX_BOXES) {
            components[componentIndex].boxIndex = boxChoice - 1;
            printf("Component moved to the selected box.\n");
        } else {
            printf("Invalid box selection. Component not moved.\n");
        }
    } else {
        printf("Component not found. Please enter a valid component name.\n");
    }
}

void searchComponent(struct Component components[], int numComponents) {
    printf("Enter the component name to search: ");
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    char componentName[50];
    scanf("%s", componentName);

    int found = 0;
    for (int i = 0; i < numComponents; i++) {
        if (strcmp(components[i].name, componentName) == 0) {
            found = 1;
            printf("Component found!\n");
            printf("Name: %s\n", components[i].name);
            printf("Working: %s\n", components[i].working ? "Yes" : "No");
            printf("Box Index: %d\n", components[i].boxIndex);
            break;
        }
    }

    if (!found) {
        printf("Component not found.\n");
    }
}
```