

## HEADER FILE

```
#include <stdio.h>
#include <stdlib.h>

/*
 * Location:Temple University Computer Science
 * Programmer:Robert Bara
 * Class:Introduction to C Programming 1057 Spring 2019 Section 004
 * Assignment:8 UPC.h for lab8
 * Date:March 27, 2019
 * Version:1
 * Description: UPC.h header to store function prototypes and const chars
for standard messages.
 */

int readInUPCCode(int a[12]);
int convert_char_to_int(char c);
int foundDigitsOnly( int a[12] );
int calculateUPCcheckDigit( int a[12] );
void valid_check(int a[11], int check );
void upc_designation(int a[0]);
void upc_type(int a[10]);

const char *MESSAGE_SUCCESSFUL_VALIDATION = "The barcode has been
successfully validated.";
const char *MESSAGE_VALIDATION_FAILURE = "Warning: Barcode error
encountered with barcode.";
```

## DRIVER

```
#include<stdio.h>
#include<stdlib.h>

/*
 * Location:Temple University Computer Science
 * Programmer:Robert Bara
 * Class:Introduction to C Programming 1057 Spring 2019 Section 004
 * Assignment:Lab 8 driver for convert_char_to_int
 * Date:March 27, 2019
 * Version:1
 * Description:A Driver for the function convert_char_to_int used in lab8
 */

int convert_char_to_int(char c);

int main()
{
    char c='4';
    for(;;){
        printf("Enter a digit");
        scanf(" %c", &c);
    }
}
```

```
        printf("%c converted to int is %d.\n", c,
convert_char_to_int(c));
```

```
    }
    return EXIT_SUCCESS;
}
```

```
int convert_char_to_int(char c)
{
    return c - '0';
}
```

```
Script started on Thu 28 Mar 2019 11:50:27 PM EDT
]0;tuj22026@astro:~/lab8  [?1034h[Thu Mar 28 23:50:27
[31mtuj22026@astro [0m:~/lab8 ] $ ./a.out
Enter a digit1
1 converted to int is 1.
Enter a digit2
2 converted to int is 2.
Enter a digit3
3 converted to int is 3.
Enter a digit4
4 converted to int is 4.
Enter a digit^C
]0;tuj22026@astro:~/lab8 [Thu Mar 28 23:50:37
[31mtuj22026@astro [0m:~/lab8 ] $ exit
exit
```

Script done on Thu 28 Mar 2019 11:50:40 PM EDT

## LAB 8

```
#include<stdio.h>
#include<stdlib.h>
#include<stdbool.h>
#include<UPC.h>
#include "../include/cis1057.h"
```

```
/*
 * Location:Temple University Computer Science
 * Programmer:Robert Bara
 * Class:Introduction to C Programming 1057 Spring 2019 Section 004
 * Assignment:8-Barcode (UPC) Scanner
 * Date: March 27, 2019
 * Version:1
 * Description:Reads in a UPC code entered by the user, validates it, and
calculates the check digit.
 */
```

```
int main()
{
    int c,i,check,valid;
    int a[12];
    print_cis1057_banner(8,"UPC Code Scanner");
    readInUPCCode(a);
    if(c==0)
```

```

    {
    printf("UPC Code:\n");
    for (i=0;i<12;i++)
        printf("%d",a[i]);
        puts("\n");
    check=calculateUPCcheckDigit(a);
    valid_check(a,check);
    upc_designation(a);
    upc_type(a);
    }
    else if(c==1)
    {
        return EXIT_SUCCESS;
    }
return EXIT_SUCCESS;
}

/*
 * Function:readInUPCCode
 * Inputs:i-used to initialize the loop
 *         c-stores what the user enters
 * Outputs:*none*
 * Globals:* none *
 * Returns: a-the prompted upc code entered by the user stored in array a, if
the code is valid, otherwise it terminates
 * Description:Prompts the user to enter a 12 digit long array to be read as
a UPC Code
 */

int readInUPCCode(int a[12])
{
    int i;
    char c;

    printf("Enter a UPC code or Q or X to exit:\n");
    scanf(" %c",&c);
    if(c=='Q' || c=='q' || c=='X' || c=='x'){
        for (i=0;i<12;i++)
            return 1;
    }

    a[0]=convert_char_to_int(c);
    for(i=1;i<12;i++){
        scanf(" %c", &c);
        a[i]=convert_char_to_int(c);
    }
    if(foundDigitsOnly(a)==1)
    {
        return 0;
    }

    return 0;
}

/*
 * Function:convert_char_to_int
 * Inputs:char c-prompted characters passed in from readInUPCCode function

```

```

    * Outputs:*none*
    * Globals:* none *
    * Returns:c-'0'-returns an int
    * Description:Takes chars from the prompted array and converts them into
ints
    */

int convert_char_to_int(char c)
{
    return c - '0';
}

/*
    * Function:foundDigitsOnly
    * Inputs:a-the prompted array being passed into this function
    *      i-used to initialize the array for the loop
    * Outputs:0-if the code is invalid
    *      1-if the code is valid
    * Globals:* none *
    * Returns:0-if the code is invalid
    *      1-if the code is valid
    * Description:Checks if the prompted UPC code that was entered in
readInUPCCode is valid
    */

int foundDigitsOnly( int a[ 12 ] )
{
    int i;
    for (i=0;i<12;i++){
        if (a[i]!=0 && a[i]!=1 && a[i]!=2 && a[i]!=3 && a[i]!=4 &&
a[i]!=5 && a[i]!=6 && a[i]!=7 && a[i]!=8 &&
a[i]!=9 )
        {
            printf("Invalid Code\n",a[i]);
            return 0;
        }
        else
        {
            printf("Valid Code\n",a[i]);
            return 1;
        }
    }
}

/*
    * Function:calculateUPCcheckDigit
    * Inputs:odd-the odd positions of a 12 digit long array
    *      even-the even positions of a 12 digit long array
    *      sum-the sum of odd multiplied by 3 and added to the evens
    *      final-the sum mod 10
    * Outputs:*none*
    * Globals:* none *
    * Returns:check-the check digit of the upc code
    * Description:Calculates the UPC check digit from the array passed in
    */

int calculateUPCcheckDigit( int a[12] )
{
    int odd,even,sum,valid, final, check;

```

```

        odd=a[0]+a[2]+a[4]+a[6]+a[8]+a[10];
        printf("The sum of the odd:\t%d\n",odd);
        even=a[1]+a[3]+a[5]+a[7]+a[9];
        printf("The sum of the even:\t%d\n", even);
        sum=(odd*3)+even;
        printf("(Odd*3)+even=\t%d\n", sum);
        final=sum%10;
        printf("The last digit is:\t%d\n",final);
        if (final==0)
        {
            check=0;
            printf("Check Digit:\t%d\n",check);
        }
        else{
            check=10-final;
            printf("Check Digit:\t%d\n",check);
        }
        return check;
    }

/*
 * Function:valid_check
 * Inputs:a[11]-the 12th digit in the array
 * Outputs:A string stored in global constant MESSAGE_SUCCESSFUL_VALIDATION to
say standard message if the code is valid
 *          A string stored in global constant MESSAGE_VALIDATION_FAILURE to
say standard message if the code is invalid
 * Globals:MESSAGE_SUCCESSFUL_VALIDATION-Stores a string for valid, from
UPC.h
 *          MESSAGE_VALIDATION_FAILURE-Stores a string for invalid, from UPC.h
 * Returns:*none*
 * Description:Displays the standard messages for validation of UPC code
 */

void valid_check(int a[12],int check )
{
    if (a[11]==check){
        printf(MESSAGE_SUCCESSFUL_VALIDATION,a);
        puts("\n");
    }
    else{
        printf(MESSAGE_VALIDATION_FAILURE,a);
        puts("\n");
    }
}

/*
 * Function:upc_designation
 * Inputs:a[0]-the 1st digit of the array
 * Outputs:*none*
 * Globals:* none *
 * Returns:*none*
 * Description:Determines what this upc is used for based on the first digit
 */

void upc_designation(int a[0])

```

```

{
    switch (a[0]){
    case 0:
        puts("This UPC is used for most products");
    break;
    case 1:
        puts("This UPC is used for most products\n");
    break;
    case 2:
        puts("This UPC is reserved for local use (store/warehouse), or
for items sold by weight\n ");
    break;
    case 3:
        puts("This UPC is used to determine drugs by National Drug
Code number. Pharmaceuticals in the U.S. have the"
            "remainder of the UPC as their National Drug Code
number.");
    break;
    case 4:
        puts("This UPC is reserved for local use, often for loyalty
cards or store coupons.");
    break;
    case 5:
        puts("This UPC is used for coupons");
    break;
    case 6:
        puts("This UPC is used for most products\n");
    break;
    case 7:
        puts("This UPC is used for most products\n");
    break;
    case 8:
        puts("This UPC is used for most products\n");
    break;
    case 9:
        puts("This UPC is used for coupons");
    break;
    default:
        puts("This UPC does not exist");
    }
}

/*
 * Function:upc_type
 * Inputs:a[11]-the 12th digit of the array
 * Outputs:*none*
 * Globals:* none *
 * Returns: *none*
 * Description:Determines what kind of media product corresponds with this
upc based on the 12th digit
 */

void upc_type(int a[10])
{
    switch (a[10]){
    case 1:

```

```

                puts("This product is either a 12'' LP/Single, or a 12''Video
CDV, you hipster.");
            break;
            case 2:
                puts("This product is a 3'' or 5'' CD, CD-ROM CDI, or VCD,
aren't these obsolete?");
            break;
            case 3:
                puts("This is a VHS tape, you watchin' a VHS??? BROOOO, What
are you stranger things.");
            break;
            case 4:
                puts("Pop out that Walkman, because this is a cassette.");
            break;
            case 5:
                puts("This product is a DCC or Beta (what even are those?));
            break;
            case 6:
                puts("This product is a Laserdisk...thats a big boi");
            break;
            case 7:
                puts("This is a 7'' single");
            break;
            case 8:
                puts("This is ...a mini disc? or 8mm type");
            break;
            case 9:
                puts("This is a Music DVD or Video DVD");
            break;
            case 0:
                puts("Bro i have no idea what kind of media this is because
0's are unassigned");
            break;
        }
    }

```

```

Script started on Fri 29 Mar 2019 12:10:07 AM EDT
]0;tuj22026@astro:~/lab8 [?1034h[Fri Mar 29 00:10:07
[31mtuj22026@astro [0m:~/lab8 ] $ ./a.out 8e.c

```

```

Lab# Assignment 8
UPC Code Scanner
Compiled:      Mar 29 2019      00:09:28
Enter a UPC code or Q or X to exit:
0 7 2 9 7 9 0 0 0 1 8 3
Valid Code
UPC Code:
072979000183

```

```

The sum of the odd:    17
The sum of the even:   26
(Odd*3)+even=    77
The last digit is:     7
Check Digit:    3
The barcode has been successfully validated.

```

This UPC is used for most products

```
This is ...a mini disc? or 8mm type
]0;tuj22026@astro:~/lab8 [Fri Mar 29 00:11:56 [31mtuj22026@astro [0m:~/lab8
] $ ./a.out 8e.c
```

```
Lab# Assignment 8
UPC Code Scanner
Compiled:      Mar 29 2019      00:09:28
Enter a UPC code or Q or X to exit:
    0 3 8 0 0 0 5 5 3 7 5 2
Valid Code
UPC Code:
038000553752
```

```
The sum of the odd:    21
The sum of the even:   15
(Odd*3)+even=    78
The last digit is:     8
Check Digit:    2
The barcode has been successfully validated.
```

```
This UPC is used for most products
This product is a DCC or Beta (what even are those?)
]0;tuj22026@astro:~/lab8 [Fri Mar 29 00:12:22 [31mtuj22026@astro [0m:~/lab8
] $ ./a.out 8e.c
```

```
Lab# Assignment 8
UPC Code Scanner
Compiled:      Mar 29 2019      00:09:28
Enter a UPC code or Q or X to exit:
    0 7 2 7 9 9 3 3 5 2 3 6
Valid Code
UPC Code:
072799335236
```

```
The sum of the odd:    22
The sum of the even:   28
(Odd*3)+even=    94
The last digit is:     4
Check Digit:    6
The barcode has been successfully validated.
```

```
This UPC is used for most products
This is a VHS tape, you watchin' a VHS??? BROOOO, What are you stranger
things.
]0;tuj22026@astro:~/lab8 [Fri Mar 29 00:12:58 [31mtuj22026@astro [0m:~/lab8
] $ ./a.out 8e.c
```

```
Lab# Assignment 8
UPC Code Scanner
Compiled:      Mar 29 2019      00:09:28
Enter a UPC code or Q or X to exit:
    3 0 5 2 1 6 0 8 5      0 0 2
Valid Code
UPC Code:
305216085002
```

```
The sum of the odd:    14
```



```
The sum of the even:    16
(Odd*3)+even=    58
The last digit is:      8
Check Digit:    2
The barcode has been successfully validated.
```

```
This UPC is used to determine drugs by National Drug Code number.
Pharmaceuticals in the U.S. have theremainder of the UPC as their National
Drug Code number.
Bro i have no idea what kind of media this is because 0's are unassigned
]0;tuj22026@astro:~/lab8 [Fri Mar 29 00:13:42 [31mtuj22026@astro [0m:~/lab8
] $ ./a.out 8e.c
```

```
Lab# Assignment 8
UPC Code Scanner
Compiled:      Mar 29 2019      00:09:28
Enter a UPC code or Q or X to exit:
7 0 1 0 7 7 7 0 1 0 7 7
Valid Code
UPC Code:
701077701077
```

```
The sum of the odd:      30
The sum of the even:      7
(Odd*3)+even=    97
The last digit is:      7
Check Digit:    3
Warning: Barcode error encountered with barcode.
```

This UPC is used for most products

```
This is a 7'' single
]0;tuj22026@astro:~/lab8 [Fri Mar 29 00:14:17 [31mtuj22026@astro [0m:~/lab8
] $ ./a.out 8e.c
```

```
Lab# Assignment 8
UPC Code Scanner
Compiled:      Mar 29 2019      00:09:28
Enter a UPC code or Q or X to exit:
0 7 9 4 0 0 8 0 4 5 0 1
Valid Code
UPC Code:
079400804501
```

```
The sum of the odd:      21
The sum of the even:      16
(Odd*3)+even=    79
The last digit is:      9
Check Digit:    1
The barcode has been successfully validated.
```

```
This UPC is used for most products
Bro i have no idea what kind of media this is because 0's are unassigned
]0;tuj22026@astro:~/lab8 [Fri Mar 29 00:15:03 [31mtuj22026@astro [0m:~/lab8
] $ ./a.out 8e.c
```

Lab# Assignment 8

```

UPC Code Scanner
Compiled:      Mar 29 2019      00:09:28
Enter a UPC code or Q or X to exit:
4 1 2 3 4 5 5 4 3 2 1 0
Valid Code
UPC Code:
412345543210

The sum of the odd:      19
The sum of the even:     15
(Odd*3)+even=      72
The last digit is:      2
Check Digit:      8
Warning: Barcode error encountered with barcode.

This UPC is reserved for local use, often for loyalty cards or store coupons.
This product is either a 12'' LP/Single, or a 12''Video CDV, you hipster.
]0;tuj22026@astro:~/lab8 [Fri Mar 29 00:15:34 [31mtuj22026@astro [0m:~/lab8
] $ ./a.out 8e.c

```

```

Lab# Assignment 8
UPC Code Scanner
Compiled:      Mar 29 2019      00:09:28
Enter a UPC code or Q or X to exit:
0 2 4 0 0 0 1 6 2 8 6 0
Valid Code
UPC Code:
024000162860

The sum of the odd:      13
The sum of the even:     16
(Odd*3)+even=      55
The last digit is:      5
Check Digit:      5
Warning: Barcode error encountered with barcode.

This UPC is used for most products
This product is a Laserdisk...thats a big boi
]0;tuj22026@astro:~/lab8 [Fri Mar 29 00:16:06 [31mtuj22026@astro [0m:~/lab8
] $ ./a.out 8e.c

```

```

Lab# Assignment 8
UPC Code Scanner
Compiled:      Mar 29 2019      00:09:28
Enter a UPC code or Q or X to exit:
0 1 1 1 1 0 8 5 6 ^[[20~      8 0 7
Valid Code
UPC Code:
011110856807

The sum of the odd:      16
The sum of the even:     15
(Odd*3)+even=      63
The last digit is:      3
Check Digit:      7
The barcode has been successfully validated.

```

```
This UPC is used for most products
Bro i have no idea what kind of media this is because 0's are unassigned
]0;tuj22026@astro:~/lab8 [Fri Mar 29 00:16:46 [31mtuj22026@astro [0m:~/lab8
] $ ./a.out 8e.c
```

```
Lab# Assignment 8
UPC Code Scanner
Compiled:      Mar 29 2019      00:09:28
Enter a UPC code or Q or X to exit:
0 5 1 0 0 0 1 3 8 1 0 1
Valid Code
UPC Code:
051000138101
```

```
The sum of the odd:      10
The sum of the even:     9
(Odd*3)+even=    39
The last digit is:      9
Check Digit:    1
The barcode has been successfully validated.
```

```
This UPC is used for most products
Bro i have no idea what kind of media this is because 0's are unassigned
]0;tuj22026@astro:~/lab8 [Fri Mar 29 00:17:16 [31mtuj22026@astro [0m:~/lab8
] $ ./a.out 8e.c
```

```
Lab# Assignment 8
UPC Code Scanner
Compiled:      Mar 29 2019      00:09:28
Enter a UPC code or Q or X to exit:
0 7 2 4 3 8 3 4 4 4 5 2
Valid Code
UPC Code:
072438344452
```

```
The sum of the odd:      17
The sum of the even:     27
(Odd*3)+even=    78
The last digit is:      8
Check Digit:    2
The barcode has been successfully validated.
```

```
This UPC is used for most products
This product is a DCC or Beta (what even are those?)
]0;tuj22026@astro:~/lab8 [Fri Mar 29 00:17:38 [31mtuj22026@astro [0m:~/lab8
] $ exit
exit
```

Script done on Fri 29 Mar 2019 12:17:46 AM EDT