

Welcome

To

Dhaka International University DEPARTMENT OF CSE

Instructor : ANTU CHOWDHURY

Batch : 93(1st Semester)

Course Code : 0613-102

Course Title : Structured Programming Languages lab

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Slide Title: Calendar Generator in C

Code

```
#include <stdio.h>

int main() {
    int year, month, daysInMonth, startDay;

    printf("Enter year: ");
    scanf("%d", &year);
    printf("Enter month (1-12): ");
    scanf("%d", &month);

    switch(month) {
        case 1: case 3: case 5: case 7: case 8: case 10: case 12:
            daysInMonth = 31;
            break;
        case 4: case 6: case 9: case 11:
            daysInMonth = 30;
            break;
        case 2:
            if ((year % 4 == 0 && year % 100 != 0) || year % 400 == 0)
                daysInMonth = 29;
            else
                daysInMonth = 28;
            break;
        default:
            printf("Invalid month.\n");
            return 1;
    }
}
```

```
startDay = (year - 1) * 365 + (year + 1) / 4 - (year + 1) / 100 + (year + 1) / 400;
for (int i = 1; i < month; i++) {
    if (i == 2) {
        if ((year % 4 == 0 && year % 100 != 0) || year % 400 == 0)
            startDay += 29;
        else
            startDay += 28;
    } else if (i == 4 || i == 6 || i == 9 || i == 11) {
        startDay += 30;
    } else {
        startDay += 31;
    }
}
startDay %= 7;
printf("\n    %d/%d\n", month, year);
printf(" Su Mo Tu We Th Fr Sa\n");
printf("=====\\n");

for (int i = 0; i < startDay; i++) {
    printf("    ");
}
for (int day = 1; day <= daysInMonth; day++) {
    printf("%3d", day);
    startDay++;
    if (startDay % 7 == 0) {
        printf("\\n");
    }
}
if (startDay % 7 != 0) {
    printf("\\n");
}
return 0;
}
```

Explanation

Code Walkthrough

Variable Declaration:

Declares integer variables year, month, daysInMonth, and startDay to store user



```
int year, month, daysInMonth, startDay;
```

User Input:

Asks the user to input the year and month.



```
// Input year and month
printf("Enter year: ");
scanf("%d", &year);
printf("Enter month (1-12): ");
scanf("%d", &month);
```

→ Determining Days in Month:

Uses a switch-case statement to determine the number of days in the given month based on its value. It handles leap years for February.



```
switch(month) {
    case 1: case 3: case 5: case 7: case 8: case 10: case 12:
        daysInMonth = 31;
        break;
    case 4: case 6: case 9: case 11:
        daysInMonth = 30;
        break;
    case 2:
        if ((year % 4 == 0 && year % 100 != 0) || year % 400 == 0)
            daysInMonth = 29;
        else
            daysInMonth = 28;
        break;
    default:
        printf("Invalid month.\n");
        return 1;
}
```

→ Calculating Start Day:

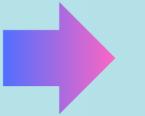
Calculates the day of the week the month starts on using Zeller's Congruence algorithm.



```
startDay = (year - 1) * 365 + (year + 1) / 4 - (year + 1) / 100 + (year + 1) / 400;
for (int i = 1; i < month; i++) {
    if (i == 2) {
        if ((year % 4 == 0 && year % 100 != 0) || year % 400 == 0)
            startDay += 29;
        else
            startDay += 28;
    } else if (i == 4 || i == 6 || i == 9 || i == 11) {
        startDay += 30;
    } else {
        startDay += 31;
    }
}
```

→ Printing Days of the Week:

Prints the names of the days of the week (Su, Mo, Tu, etc.)



```
startDay %5= 7;
```

→ Calendar Header:

Prints the header for the calendar indicating the month and year.



```
printf("\n %d/%d\n", month, year);
printf(" Su Mo Tu We Th Fr Sa\n");
printf("=====\\n");
```

→ Leading Spaces:

Prints leading spaces to align the first day of the month correctly under the appropriate day of the week.



```
for (int i = 0; i < startDay; i++)
    printf(" ");
```

→ Printing Days of the Month:

Prints the days of the month with appropriate spacing. Increments the startDay variable to keep track of the day of the week.



```
for (int day = 1; day <= daysInMonth; day++) {  
    printf("%3d", day);  
    startDay++;  
    if (startDay % 7 == 0) {  
        printf("\n");  
    }  
}
```

→ Newline Handling:

Prints a newline if necessary to ensure the last week of the month is properly formatted.



```
if (startDay % 7 != 0) {  
    printf("\n");  
}
```

→ Return:

Returns 0 to indicate successful execution of the program.



```
return 0;  
}
```

- This code essentially generates a textual representation of a calendar for a given month and year in the console.

OUTPUT:

```
Enter year: 2024  
Enter month (1-12): 3
```

```
3/2024  
Su Mo Tu We Th Fr Sa  
=====  
          1  2  
3  4  5  6  7  8  9  
10 11 12 13 14 15 16  
17 18 19 20 21 22 23  
24 25 26 27 28 29 30  
31
```

```
== Code Execution Successful ==|
```