Lab 4P: Decision Structures and Boolean Logic_ 4P_DSBL

GADDIS Text Pages 152 - 155

Assigned Projects = 4 (85 Pts)

Using the IDLE editor (FILE/New Window)……

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For EACH Project you complete:

1. Create a FLOWCHART for each program and attach a Screenshot(s) of your FLOWCHART.

2. Take one Screenshot of both the EDIT window disiplaying your program and the SHELL window displaying your program results and paste as directed.

Project 1: Roman Numerals (25 Pts)

Input; number = 8

Write a program that prompts the user to enter a number within the range of 1 through 10. The program should display the Roman numeral version of that number. If the number is outside the range of 1 through 10, the program should display an error message. The following table shows the Roman numerals for the numbers 1 through 10:

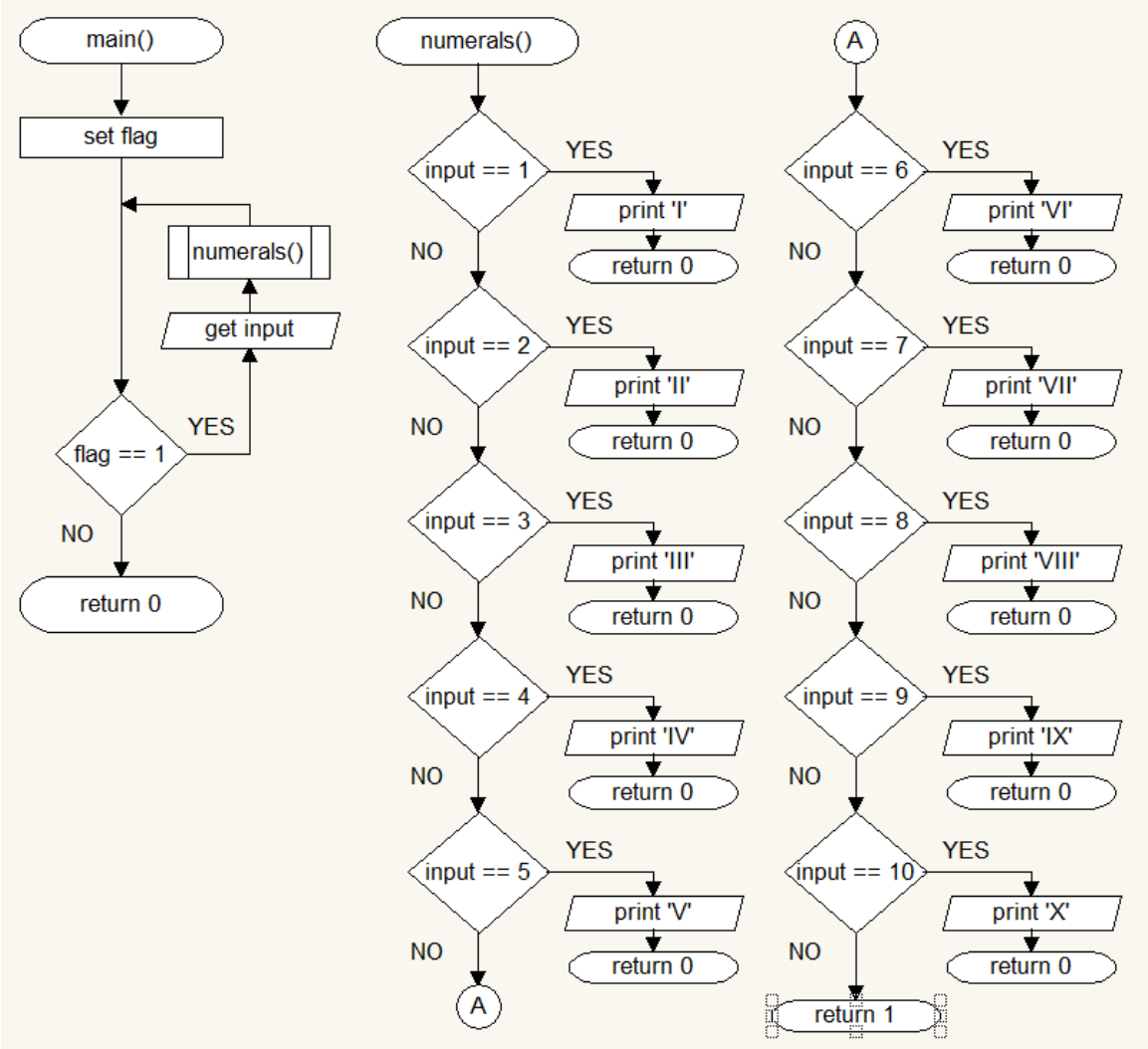
Number	Roman Numeral
1	I
2	II
3	III
4	IV
5	V
6	VI
7	VII
8	VIII
9	IX
10	X

```
def numerals(userInput):
    if userInput == '1':
        print("I")
    elif userInput == '2':
        print("II")
    elif userInput == '3':
        print("III")
    elif userInput == '4':
        print("IV")
    elif userInput == '5':
        print("V")
    elif userInput == '6':
        print("VI")
    elif userInput == '7':
        print("VII")
    elif userInput == '8':
        print("VIII")
    elif userInput == '9':
        print("IX")
    elif userInput == '10':
        print("X")
    else:
        print("Invalid entry value!")
        return 1

def main():
    flag = 1
    while(flag == 1):
        flag = numerals(input("Please enter a number 1-10: "))

main()
```

```
>>>
Please enter a number 1-10: 8
VIII
>>>
```



Project 4: Magic Dates (20 Pts)

Input: Month = 5, Day = 18, Year = 13

The date June 10, 1960, is special because when it is written in the following format, the month times the day equals the year:

6/10/60

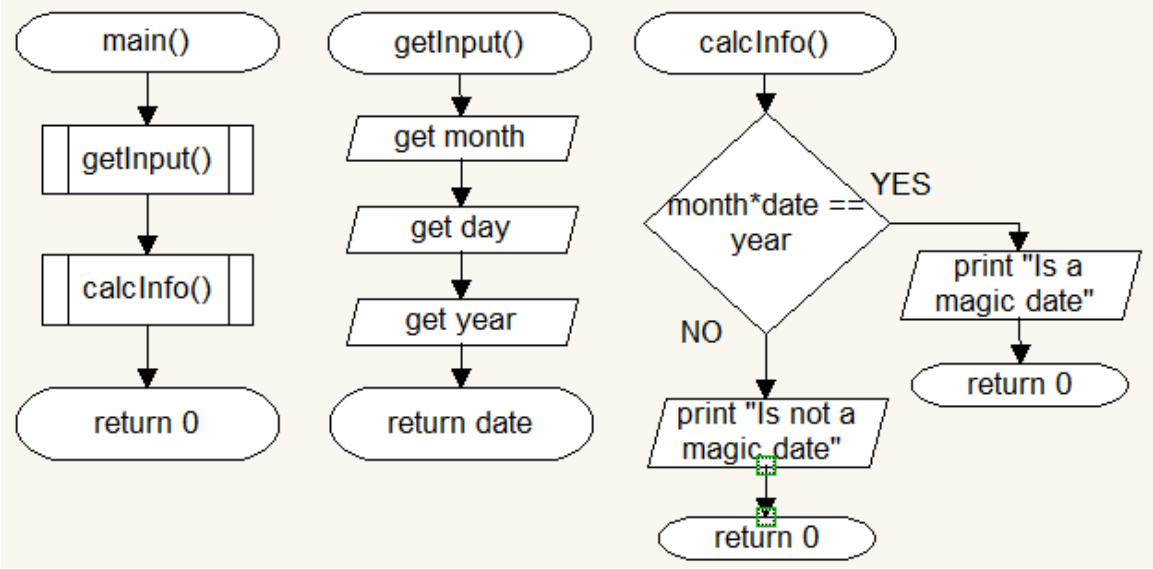
Design a program that asks the user to enter a month (in numeric form), a day, and a two-digit year. The program should then determine whether the month times the day equals the year. If so, it should display a message saying the date is magic. Otherwise, it should display a message saying the date is not magic.

```
def getInput():
    date = {}
    date['month'] = int(input("Enter month: "))
    date['day'] = int(input("Enter day: "))
    date['year'] = int(input("Enter two digit year: "))
    return date

def calcInfo(date):
    if date['month']*date['day'] == date['year']:
        print("That is a magic date!")
    else:
        print("That is not a magic date.")
def main():
    calcInfo(getInput())

main()
```

```
>>>
Enter month: 5
Enter day: 18
Enter two digit year: 13
That is not a magic date.
>>>
```



Project 7: Book Club Points (15 Pts)

Serendipity Booksellers has a book club that awards points to its customers based on the number of books purchased each month. The points are awarded as follows:

- If a customer purchases 0 books, he or she earns 0 points.
- If a customer purchases 1 book, he or she earns 5 points.
- If a customer purchases 2 books, he or she earns 15 points.
- If a customer purchases 3 books, he or she earns 30 points.
- If a customer purchases 4 or more books, he or she earns 60 points.

Write a program that asks the user to enter the number of books that he or she has purchased this month and displays the number of points awarded.

Input: Books = 5

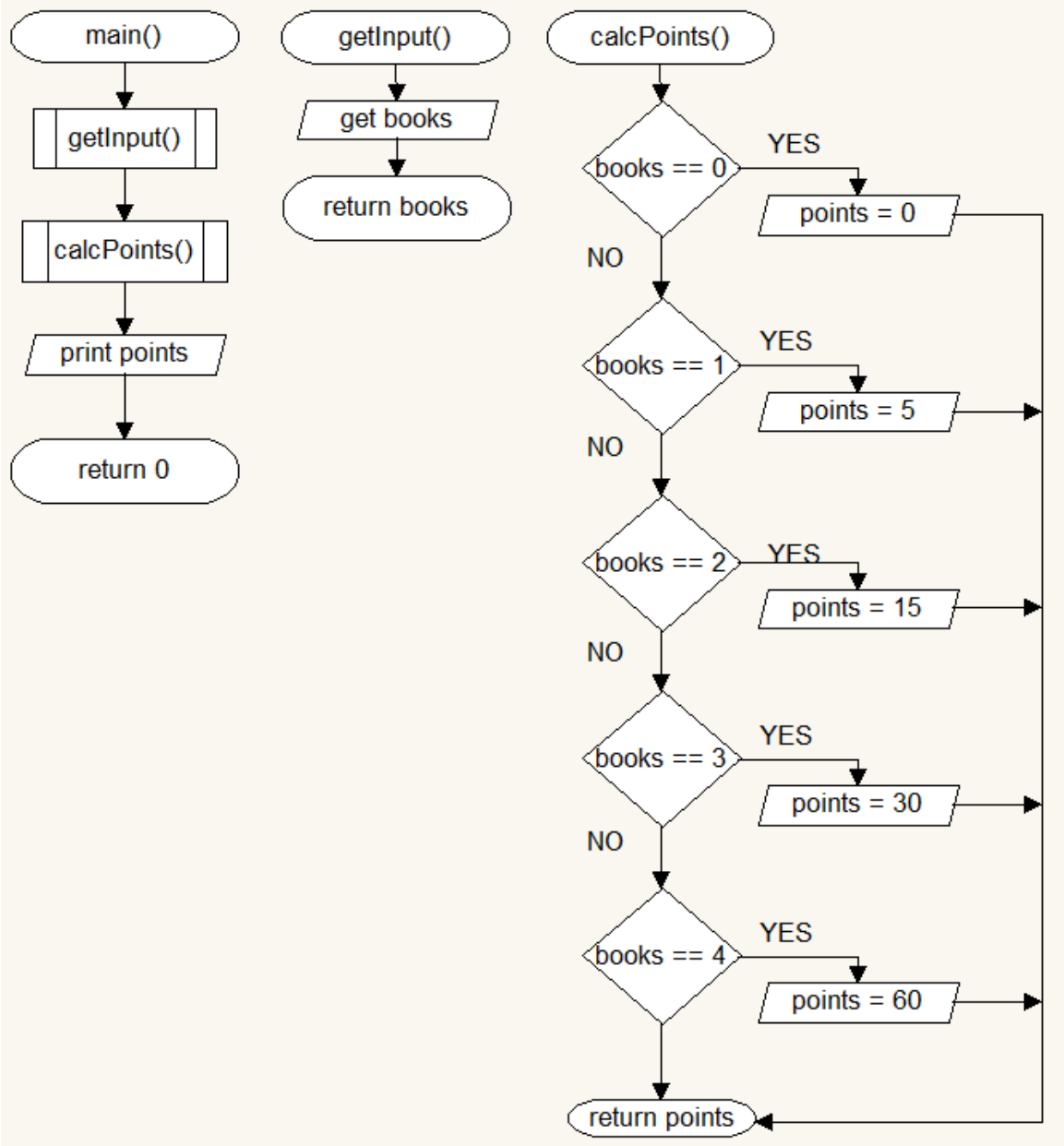
```
def getInput():
    books = int(input("Books purchased this month: "))
    return books

def calcPoints(books):
    if books == 0:
        points = 0
    if books == 1:
        points = 5
    if books == 2:
        points = 15
    if books == 3:
        points = 30
    if books >= 4:
        points = 60
    return points

def main():
    print("You have earned %d points this month!" % calcPoints(getInput()))

main()
```

```
>>>
Books purchased this month: 5
You have earned 60 points this month!
>>>
```


main()
getInput()
calcPoints()
print points
return 0
getInput()
get books
return books
calcPoints()
books == 0
YES
points = 0
NO
books == 1
YES
points = 5
NO
books == 2
YES
points = 15
NO
books == 3
YES
points = 30
NO
books == 4
YES
points = 60
return points

Project 11: Time Calculator (25 Pts)

Input: Time(seconds) = 9500

Write a program that asks the user to enter a number of seconds, and works as follows:

- There are 60 seconds in a minute. If the number of seconds entered by the user is greater than or equal to 60, the program should display the number of minutes in that many seconds.
- There are 3,600 seconds in an hour. If the number of seconds entered by the user is greater than or equal to 3,600, the program should display the number of hours in that many seconds.
- There are 86,400 seconds in a day. If the number of seconds entered by the user is greater than or equal to 86,400, the program should display the number of days in that many seconds.

```
def getInfo():
    seconds = int(input("Enter seconds: "))
    return seconds

def calcResults(seconds):
    if seconds < 60:
        print("%d seconds" %
              seconds)

    if seconds >= 86400:
        days = seconds/86400
        hours = (seconds%86400)/3600
        minutes = (seconds%3600)/60
        seconds = seconds%60
        print("%d days\n%d hours\n%d minutes\n%d seconds" %
              (days, hours, minutes, seconds))

    if seconds >= 3600:
        hours = seconds/3600
        minutes = (seconds%3600)/60
        seconds = seconds%60
        print("%d hours\n%d minutes\n%d seconds" %
              (hours, minutes, seconds))

    if seconds >= 60:
        minutes = seconds/60
        seconds = seconds%60
        print("%d minutes\n%d seconds" %
              (minutes, seconds))

def main():
    calcResults(getInfo())

main()
```

```
2 hours
38 minutes
20 seconds
>>>
```