

Course ISE 323: Information Systems Engineering 1

Recitation 5 Exercise

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1 System Flow Charts

Briefly describe what System Flowcharts are. How are they different from Program Flowcharts?

2 HIPO

What is a HIPO diagram? Describe the function of the Vertical Table of Contents (VTOC) and Input-Process-Output (IPO) charts.

3 Initial Design

What is the main purpose of the Initial Design document?

3.1 Answer

The Initial Design document is meant to describe the desired behavior of the new system at a high level, not too technical. It should be based on the current state examination (if there is any) and include information about what the new system should do. Important aspects of the document are:

- its identification of business processes in the organization
- its definition of the relationships between the new system and the organization's business processes
- the definition of goals with priorities
- identifying technical and organizational constraints
- the definition of the scope of the new system
- some initial approximations of what the scale of the system will be - users, data, response time, reliability, up time

4 Voting

The following is pseudocode adapted from C#:

```

ArrayList votes = GetVotes();
int dems = 0, repubs = 0;

foreach ( string vote in votes )
{
    string[] parts = vote.Split('-');
    string candidate = parts[0];
    string state = parts[1];

    if ( candidate == "Obama" )
    {
        Console.WriteLine("Democrat " + state);
        dems++;
    }
    else if ( candidate == "McCain" )
    {
        Console.WriteLine("Republican " + state);
        repubs++;
    }
    else
    {
        Console.WriteLine("Other " + state);
    }
}
Console.WriteLine("Democrats: " + dems);
Console.WriteLine("Republicans: " + repubs);

```

The code takes inputs of the form “Candidate-State” from the function GetVotes(). It then produces some output (it should be fairly clear) based on the input. Describe the logic in the above program in the following three forms:

1. Natural language

Answer A list of votes is provided. Each vote contains the name of a candidate and the state of the voter. For each vote for “Obama”, print out “Democrat” and the name of the state. For each vote for “McCain”, print out “Republican” and the name of the state. For any other candidate, print “Other” and the state. At the end, print a tally of all Democratic and Republican votes.

2. Structured language

Answer

```

Begin
Run GetVotes() and store the list returned in votes
dems = 0; repubs = 0
For each line in the votes list
    Write the first half of the vote record into candidate
    and the second half into state
    If candidate = "Obama" Then
        print "Democrat" and the state
        increment dems
    Else If candidate = "McCain" Then

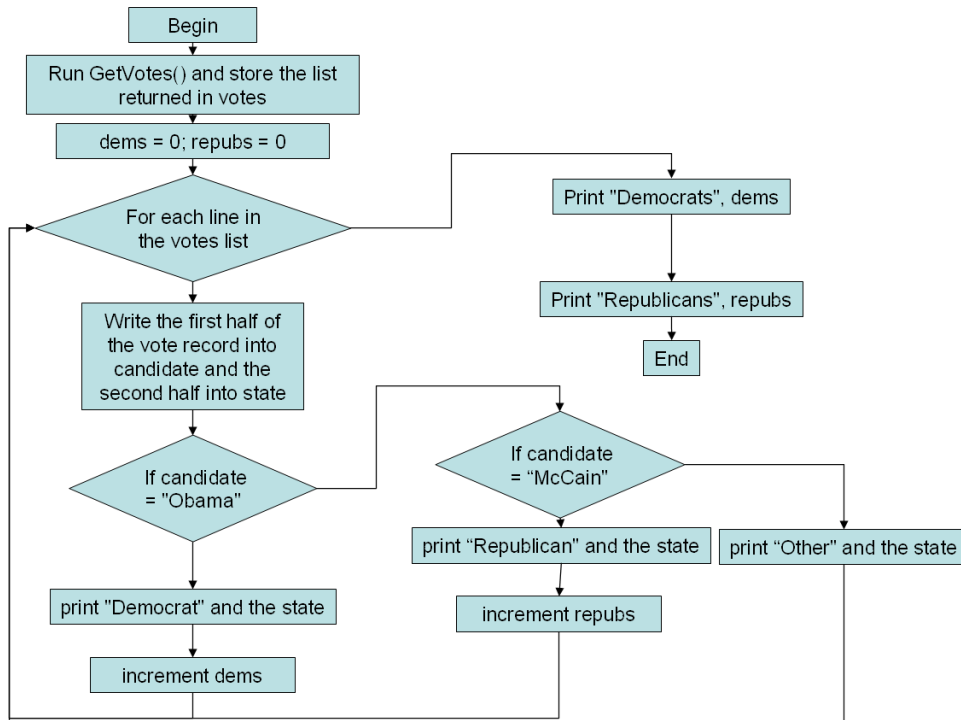
```

```

        print "Republica" and the state
        increment repubs
    Else print "Other" and the state
End For each
Print "Democrats", dems
Print "Republicans", repubs
End

```

3. Program flow chart



Hint: The structured language format will be very similar to the code above, but please use the format described in class, excluding all function calls.

5 Library Acquisition

The college library has the following (business) process for the acquisition of new books for courses;

After an instructor prepares the syllabus for a course, the syllabus must include information about the books which the course will use. The instructor must send a copy of the syllabus to the library to inform them of the course's needs. The librarian or his assistants inspect the book list and compare it against the expected student registration for the course. If there are already enough copies of the book in the library for the course's books, no action needs to be taken.

If there is an insufficient number of copies of the books for the course, the library must place an order. To save time and shipping costs, the library will only place orders once every two months for books or when there are a large number already waiting to be ordered (say 20).

There is a single book vendor service which the library contracts with. There are two choices for ordering books - used and new. If the vendor has access to used copies of a book, they are

ordered. Otherwise, new ones are ordered. The librarian is in charge of approving and making orders with the vendor.

When an order arrives at the library, the box is opened and the books are examined by a library assistant. Each (correctly shipped) book is immediately assigned a bar code and entered into the database as soon as it leaves the box. The books are then placed aside for rebinding if necessary, labeling, and sorting. The librarian may send an email to the appropriate lecturer informing him that books for his class have arrived.

Each book is cataloged and assigned a shelf number based on the library's ordering system by a library assistant. Each book is also given a magnetic tag and label on the inside with bar coded information about the book, its author, and category. When the books are ready, they are distributed to the shelves by a library assistant.

The above, rather long quote is a fairly full description of the business processes involved in ordering books for the college library. We can identify several stages in the ordering process:

1. Receipt of the syllabus and examination of existing books versus student count
2. Collection of books to be ordered
3. Communication with the book vendor to order the books
4. Unpacking of orders and initial entry of books into the database
5. Categorization, labeling, and shelving of books

Use the various charting and graphing techniques discussed in class to depict all of the processes above. Consider how you can use structured language, process charts, flow charts, system flow charts, and DFDs to depict the various actors, processes, and data stores needed to support the above processes.