Fatih Selim Yakar 161044054

Computer Organization Project 1 Report

Explanations

- Definitions: I define the sets beginning of .asm file. For holding the number of sets I define 1 word(4bytes) .space, for holding the size of sets I define the 11 element word(44bytes) .space, for holding the subsets I define 11(unions set included) 80 word spaces.
- Functions:
    - *returnMaxIntersect:* Loop through all subsets to find and return the maximum intersect with the main sets.
    - *Greedy:* Performs the algorithm and prints the smallest covering sets. In the loop, it constantly calls returnMaxIntersect and assigns it to the main set, taking the difference with the main set. When the main set is set to 0, the loop ends.
    - *readInput:* Reads the input from user and initialize the sets. In the function There are two nested loops for getting the user inputs.
    - *Readfile:* Opens the file then reads the file from .txt to .space (char array) after that print file
    - *Linear_search:* Checks whether there is a match with the element sought in the array with a loop. Returns the index of this element, if any. Otherwise, it returns -1.
    - *Intersect:* It takes 2 arrays and searches for all elements in one array using the search function in the other array, and if it finds it, adds it to a new set. Returns the elements found.
    - *Difference:* It takes 2 arrays and searches for all elements in one array using the search function in the other array, and if it does not find it, adds it to a new set. Returns the elements found.
    - *Union:* It takes 2 arrays and takes the difference of the first array from the second. It adds the elements of the second array to the array.
    - *Print_array:* Traverse elements in loop and prints them with syscall.

Missing Parts

There is no missing parts in the project.

Bonus Parts

I read the file and save the byte(char) array but I do not use this. I get the inputs from user

Adding Parts

Although the Union function was written, I did not need it.

Note: The first input set is set as input and the rest is subset. Sometimes it finds the right set, but it can print the same set twice. (But true ones only number of prints false)

EXAMPLE 1

```
Please enter the number of sets(Including union set. The first set will be taken as union):4

Please enter the number of element:5

Enter the element:1

Enter the element:2

Enter the element:3

Enter the element:4

Enter the element:5

Please enter the number of element:3

Enter the element:4

Enter the element:1

Enter the element:3

Please enter the number of element:2

Enter the element:2

Enter the element:5

Please enter the number of element:4
Enter the element:1

Enter the element:4

Enter the element:3

Enter the element:2
Covered set is:1 4 3 2
Covered set is:2 5

-- program is finished running --
```

EXAMPLE 2

$U = \{1,2,3,4,5,6,7,8,9,10,11,12,13\}$

$S_1 = \{1,2\}$
$S_2 = \{2,3,4,5\}$
$S_3 = \{6,7,8,9,10,11,12,13\}$

```
Covered set is:6 7 8 9 10 11 12 13
Covered set is:2 3 4 5
Covered set is:1 2

-- program is finished running --
```

EXAMPLE 3

$U = \{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20\}$

$S_1 = \{1,2,3,4,5,6,7,8,9,10\}$
$S_2 = \{9,10,11,12,13,14,15,16,17,18\}$
$S_3 = \{19,20\}$
$S_4 = \{4,5,6,7,8,9,10,11\}$
$S_5 = \{11,9,7,5,3,1\}$

```
Covered set is:9 10 11 12 13 14 15 16 17 18
Covered set is:1 2 3 4 5 6 7 8 9 10

-- program is finished running --
```

EXAMPLE 4

U = {10,35,99,240,60}

S_1 = {60,240,99,35,10}
S_2 = {10,35,99}
S_3 = {240,60}
S_4 = {10}
S_5 = {10,99,60}

```
Covered set is:60 240 99 35 10

-- program is finished running --
```

EXAMPLE 5

U = {10,91,32,56,98,5,13}

S_1 = {10,91,32}
S_2 = {10}
S_3 = {13,5,98}
S_4 = {32,5,13,56,98}
S_5 = {56,32}
S_6 = {91}
S_7 = {32}
S_8 = {56}
S_9 = {98}
S_{10} = {13,5}

```
Covered set is:32 5 13 56 98
Covered set is:10 91 32
```

EXAMPLE 6

U = {22,7,1998,5,2000}

S_1 = {5,7,22,200,1998}

```
Enter the element:1998
Covered set is:5 7 22 2000 1998

-- program is finished running --
```