Algorithms and Analysis

Greedy algorithms - Practice

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Objectives

- Practice on greedy algorithm

In this participation, you need to implement the two algorithms that solve Activity problem and Huffman codes, respectively.

1. You need to implement the algorithms learned in class.
2. Submit the code to dropbox on time to receive credits

1. For Activity problem, you can use the following data and result to verify your program and you can implement either recursive or iterative version of the greedy algorithm learned in class.

i	1	2	3	4	5	6	7	8	9	10	11
s_i	1	3	0	5	3	5	6	8	8	2	12
f_i	4	5	6	7	9	9	10	11	12	14	16

For this example, the subset $\{a_3, a_9, a_{11}\}$ consists of mutually compatible activities. It is not a maximum subset, however, since the subset $\{a_1, a_4, a_8, a_{11}\}$ is larger. In fact, $\{a_1, a_4, a_8, a_{11}\}$ is a largest subset of mutually compatible activities; another largest subset is $\{a_2, a_4, a_9, a_{11}\}$.

2. For Huffman codes, you can use the following data and result to verify your program.

	a	b	c	d	e	f
Frequency (in thousands)	45	13	12	16	9	5
Fixed-length codeword	000	001	010	011	100	101
Variable-length codeword	0	101	100	111	1101	1100

Sample output

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the optimal activity arrangement:
{1,4,8,11,}

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Huffman code for letter a: 0
Huffman code for letter b: 1 0 1
Huffman code for letter c: 1 0 0
Huffman code for letter d: 1 1 1
Huffman code for letter e: 1 1 0 1
Huffman code for letter f: 1 1 0 0
```