**Question 2:**

n; s[n]; f[n](sorted);v[n];

T(j): largest index i (<j) such that job i is compatible with j;

Optimal Structure:

* Case 1: select job j

OPT[j] = vj + OPT [T(j)];

* Case 2: does not select job j;

OPT[j] = OPT [j-1];

Calculate T(1) to T(n);

OPT[0] = 0;

for j 1 to n;

OPT(j) = max (vj + OPT[T(j)], OPT[j-1])

Return OPT[n]

FindSolution(j){

if (j=0)

return null;

else if (vj + OPT[T(j)] > OPT [j-1])

print j;

FindSolution(T(j));

else

FindSolution(j-1);

**Question 3:**

Find the minimum minutes to get value big V, while each question is Q[i] (vi, mi)

Table:

While k is the total item [0........n] and v is the total value v [0........V], the T[k, v] means that the minimum required time to get total value v with k items.

Formulation: Min\_time = T[n, V]

|-> Min( T[k-1, v], m[k] ) if v[k] >= v

T[k, v] = |

|-> Min( T[k-1, v], T[k-1, v-v[k]] + m[k]) otherwise

Build T[k, v] Table:

Initialize T table:

for v = 0 to V

T[0, v] =MAX\_INFINITE (It will never get value v when there was 0 item )

for k = 1 to n

for v = 0 to V

compute T[k, v] by using above formula;

Example:

Question list: i.( v, m )

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1. ( 2, 3 )

2. ( 3, 2 )

3. ( 4, 5 )

4. ( 5, 6 )

The Max value: 5

The Min\_time : 5

The solution is: 2, 1

n\v 0 | 1 | 2 | 3 | 4 | 5 |

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0 | XX | XX | XX | XX | XX | XX |

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1 | 3 | 3 | 3 | XX | XX | XX |

-----------+---------+---------+---------+---------+---------+

2 | 2 | 2 | 2 | 2 | 5 | 5 |

-----------+---------+---------+---------+---------+---------+

3 | 2 | 2 | 2 | 2 | 5 | 5 |

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4 | 2 | 2 | 2 | 2 | 5 | 5 |

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Note: xx = MAX\_INFINITE

Computing process:

K=1 and v = 0 to V

T[1, 0 ] = 3, since v1 =2 >= v=0 and m1=3 < T[0, 0] = XX

T[1, 1 ] = 3, since v1 =2 >= v=1 and m1=3 < T[0, 1] = XX

T[1, 2 ] = 3, since v1 =2 >= v=2 and m1=3 < T[0, 2] = XX

T[1, 3 ] = XX, since v1 =2 < v=3 and m1=(3 + T[0, 1] ) > T[0, 3] = XX

T[1, 4 ] = XX, since v1 =2 < v=4 and m1=(3 + T[0, 2] ) > T[0, 4] = XX

T[1, 5] = XX, since v1 =2 < v=5 and m1=(3 + T[0, 3] ) > T[0, 5] = XX

K=2 and v = 0 to V

T[2, 0 ] = 2, since v2 =3 >= v=0 and m2=2 < T[1, 0] = 3

T[2, 1 ] = 2, since v2 =3 >= v=1 and m2=2 < T[1, 1] = 3

T[2, 2 ] = 2, since v2 =3 >= v=2 and m2=2 < T[1, 2] = 3

T[2, 3 ] = 2, since v2 =3 >= v=3 and m2=2 < T[1, 3] = XX

T[2, 4 ] = 5, since v2 =3 < v=4 and m2=(2 + T[1, 1] =5) < T[1, 4] = XX

T[2, 5] = 5, since v2 =3 < v=5 and m2=(2 + T[1, 2] =5) < T[1, 5] = XX

K=3 and v = 0 to V

T[3, 0 ] = 2, since v3 =4 >= v=0 and m3=5 > T[2, 0] = 2

T[3, 1 ] = 2, since v3 =4 >= v=1 and m3=5 > T[2, 1] = 2

T[3, 2 ] = 2, since v3 =4 >= v=2 and m3=5 > T[2, 2] = 2

T[3, 3 ] = 2, since v3 =4 >= v=3 and m3=5 > T[2, 3] = 2

T[3, 4 ] = 5, since v3 =4 >= v=4 and m3=5 >= T[2, 4] = 5

T[3, 5] = 5, since v3 =4 < v=5 and m3=(5 + T[2, 1] =7) > T[2, 5] = 5

K=4 and v = 0 to V

T[4, 0 ] = 2, since v4 =5 >= v=0 and m4=6 > T[3, 0] = 2

T[4, 1 ] = 2, since v4 =5 >= v=1 and m4=6 > T[3, 1] = 2

T[4, 2 ] = 2, since v4 =5 >= v=2 and m4=6 > T[3, 2] = 2

T[4, 3 ] = 2, since v4 =5 >= v=3 and m4=6 > T[3, 3] = 2

T[4, 4 ] = 5, since v4 =5 >= v=4 and m4=6 > T[3, 4] = 5

T[4, 5] = 5, since v4 =5 >= v=5 and m4=6 > T[3, 5] = 5