

# Activity Selection Problem

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## Abstract

The *Activity Selection Problem* is a combinatorial optimization problem that seeks to find the most "profitable" set of non-conflicting activities to perform within a given time frame. This means given that each activity has a start and end time, by definition, that no two activities can overlap when considering which new activities to add to the subset. In other words, the problem is to select the maximum number of activities that can be performed by a single person, assuming that a person can only work on a single activity at a time.

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### Algorithm 1 Activity Selection

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1:  $A(0) \leftarrow 0$ 
2: for  $j : 1 \dots k$  do
3:    $max \leftarrow 0$ 
4:   for  $i = 1 \dots n$  do
5:     if  $f_i = u_j$  then
6:       if  $p_i + A(H(i)) > max$  then
7:          $max \leftarrow p_i + A(H(i))$ 
8:       end if
9:     end if
10:  end for
11:  if  $A(j-1) > max$  then
12:     $max \leftarrow A(j-1)$ 
13:  end if
14:   $A(j) \leftarrow max$ 
15: end for
```

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**Note:** Given our algorithm, we are assuming that the list of activity has natural ordering, sorted according to their finish time.