

Openjaw has decided to branch into new businesses, and the business team has decided that we should set up a real estate agency. You have been tasked with the creation of the “Perfect home finder” application. This application will find the perfect home for a set of families given a set of important coordinates and a list of requirements for each family. “Perfect home finder” will determine which house is the perfect fit for each family using these rules:

- Every house starts with a perfect 100 score.
- For each tile of distance to the closest workplace the house will lose 1 point for every worker in the family.
- For each tile of distance to the closest swimming pool the house will lose 1 point for every child in the family.
- For each tile of distance to the closest dog park the house will lose 1 point for each dog in the family.
- The perfect house for a given family will be the one that has the highest possible score and can be afforded with their budget.

You should build a Java application that receives the JSON data in the specified format (found in the next pages) and prints the perfect home for each family in this format:

“The perfect home for <family_name> is <house_name>”

This can be printed in any way, there are no constraints regarding that. We are not including any specific time constraint on this exercise so we expect a properly coded solution that you would be happy to deploy in a pre-production environment. Show us your best coding!

In the next pages you will find an example of the input format, the output format and the calculations made by the application in order to decide which house is the perfect home for a given family.

INPUT FORMAT

```
{
  "map": {
    "height": 5,
    "width": 5
  },
  "keyLocations": {
    "pools": [
      {
        "x": 0,
        "y": 1
      },
      {
        "x": 2,
        "y": 3
      }
    ],
    "workplaces": [
      {
        "x": 3,
        "y": 4
      },
      {
        "x": 1,
        "y": 1
      }
    ],
    "dogParks": [
      {
        "x": 2,
        "y": 2
      }
    ]
  },
  "homes": [
    {
      "name": "Comfy condo",
      "x": 1,
      "y": 2,
      "price": 250000
    },
    {
      "name": "Lofty loft",
      "x": 4,
      "y": 4,
      "price": 185000
    }
  ]
}
```

```

    },
    {
      "name": "Burns Manor",
      "x": 1,
      "y": 3,
      "price": 9999999
    }
  ],
  "families": [
    {
      "name": "The Simpsons",
      "workers": 1,
      "children": 3,
      "dogs": 1,
      "Budget": 255000
    },
    {
      "name": "The Van Houtens",
      "workers": 2,
      "children": 1,
      "dogs": 1,
      "Budget": 195000
    }
  ]
}

```

OUTPUT FORMAT

“The perfect house for The Simpsons is the Comfy condo”

“The perfect house for The Van Houtens is the Lofty loft”

EXPLANATION

In this case the comfy condo would be the best house for the simpsons, we would reach the conclusion by calculating the score for the three houses:

- Comfy Condo (located at 1,2)

- 100(initial perfect score)
- 1 point lost for workplace distance, since the the nearest workplace is at 1,1 and there is one worker in the family. $1(\text{distance}) * 1(\text{number of workers})$
- 6 points lost for Swimming pool distance, since the nearest pool is at 0,1. $2(\text{distance}) * 3(\text{number of kids in the family})$
- 1 point lost for dog parks, since the nearest dog park is at 2,2 and there is one dog in the family. $1(\text{distance}) * 1(\text{number of dogs})$
- The total score would be: $100 - 1 - 6 - 1 = 92$

- Lofty loft (located at 4,4)

- 100(initial perfect score)
- 1 point lost for workplace distance, since the nearest workplace is at 3,4 and there is one worker in the family. $1(\text{distance}) * 1 (\text{number of workers})$
- 9 points lost for Swimming pool distance, since the nearest pool is at 2,3. $3(\text{distance}) * 3(\text{number of kids in the family})$
- 4 points lost for dog parks, since the nearest dog park is at 2,2 and there is one dog in the family. $4(\text{distance}) * 1 (\text{number of dogs})$
- The total score would be: $100 - 1 - 9 - 4 = 86$

- Burns manor (located at 1,3)

- 100(initial perfect score)
- 2 points lost for workplace distance, since the nearest workplace is at 0,1 and there is one worker in the family. $2(\text{distance}) * 1 (\text{number of workers})$
- 3 points lost for Swimming pool distance, since the nearest pool is at 2,3. $1(\text{distance}) * 3(\text{number of kids in the family})$
- 2 points lost for dog parks, since the nearest dog park is at 2,2 and there is one dog in the family. $2(\text{distance}) * 1 (\text{number of dogs})$
- The total score would be: $100 - 2 - 3 - 2 = 93$

If we were to only look at the score, we should assign the Burns Manor to the Simpsons family, but the price is above their budget ($9999999 > 255000$), so we will assign the comfy condo instead, which meets the budget rule.