# CSE 160 Section 4 Solutions

## Question 1

```
{1, 6, 3, 9, 5, 2, 4}
```

Remember sets are unordered, so the order of the values above has no significance.

## Question 2

```
print set_one & set_two
```

The intersection is: `{'a', 'c', 'd'}`

## Question 3

```
62
KeyError: 0
{'low': 42, 'high': 58, 'precipitation': 0.5}
```

## Question 4

For a given company, how much did that company spend in total?

```
def total_costs(expenditures, company):
  """
  Given a company's name (string) and a list of expenditure reports,
  returns the total expenditures for that company.
  """
  # Keep a running sum of expenditures for the given company
  total = 0
  for item in expenditures:
    if item['Company'] == company:
      total += item['Cost']

  return total
```

For a given company, how much did that company spend on payroll?

```
def payroll_costs(expenditures, company):
  """
  Given a company's name (string) and a list of expenditures, returns the
  total payroll expenditures for that company.
  """
  total = 0
  for item in expenditures:
    if item['Company'] == company and item['Purpose'] == 'payroll':
      total += item['Cost']

  return total
```

What are all the companies that made expenditures?

```
def all_companies(expenditures):
  """
  Given a list of expenditures, returns a set of all the companies that
  had expenditures.
  """
  companies = set()
  for item in expenditures:
    companies.add(item['Company'])

  return companies
```

Which company spent the least in total?

```
def lowest_costs(expenditures):
  """
  Given a list of expenditure reports, returns the name of the company
  that spent the least money.
  """
  # Get a set of all companies
  companies = all_companies(expenditures)

  # Get a dictionary from a company to that company's expenditures
  costs = {}
  for company in companies:
    costs[company] = total_costs(expenditures, company)

  # Keep a running min of the lowest expenditures
  min_name = None
  for company_name in costs:
    if min_name == None or costs[company_name] < costs[min_name]:
      min_name = company_name

  return min_name
```

What are the evil companies, if any, that didn't have any payroll expenditures (and so clearly aren't paying their employees). When you've finished this function, do a Google search on "google motto".

```
def evil_companies(expenditures):
  """
  Returns a set of evil companies (the ones that aren't paying their
  employees).
  """
  companies = all_companies(expenditures)
  evil_companies = set()
  for company in companies:
    if payroll_costs(expenditures, company) == 0:
      evil_companies.add(company)

  return evil_companies
```