

```
class BinomialHeap:
```

```
    def __init__(self):
        self.trees = []
```

```
    def extract_min(self):
```

```
        if self.trees == []:
            return None
```

```
        smallest_node = self.trees[0]
```

```
        for tree in self.trees:
```

```
            if tree.key < smallest_node.key:
                smallest_node = tree
```

```
        self.trees.remove(smallest_node)
```

```
        h = BinomialHeap()
```

```
        h.trees = smallest_node.children
```

```
        self.merge(h)
```

```
    def get_min(self):
```

```
        if self.trees == []:
```

```
            return None
```

```
        least = self.trees[0].key
```

```
        for tree in self.trees:
```

```
            if tree.key < least:
```

```
                least = tree.key
```

```
        return least
```

```
    def combine_roots(self, h):
```

```
        self.trees.extend(h.trees)
```

```
        self.trees.sort(key=lambda tree: tree.order)
```

```
    def merge(self, h):
```

```
        self.combine_roots(h)
```

```
if self.trees == []:
```

```
    return
```

```
    i = 0
```

```
    while i < len(self.trees) - 1:
```

```
        current = self.trees[i]
```

```
        after = self.trees[i+1]
```

```
        if current.order == after.order:
```

```
            if (i+1) < len(self.trees) - 1:
```

```
                and self.trees[i+2].order ==
```

```
                    after.order:
```

```
                    after_after = self.trees[i+2]
```

```
                    if after.key < after_after.key:
```

```
                        after.add_at_end(after_after)
```

```
                        del self.trees[i+2]
```

```
                    else:
```

```
                        after_after.add_at_end(after)
```

```
                        del self.trees[i+2]
```

```
            else:
```

```
                if cur.key < after.key:
```

```
                    cur.add_at_end(after)
```

```
                    del self.trees[i+1]
```

```
                else:
```

```
                    after.add_at_end(cur)
```

```
                    del self.trees[i]
```

```
            i = i + 1
```

```
def insert(self, key):
```

```
    g = BinomialHeap()
```

```
    g.trees.append(BinomialTree(key))
```

```
    self.merge(g)
```