

Pensieve header: A package to manage equivalence relations.

```
In[ ]:= SetAttributes[{EROMake, EROPeek, EROAdjoin}, HoldFirst];
```

```
In[ ]:= EROMake[er_, n_Integer] := er = Table[0, n];
```

```
EROPeek[er_, n_Integer] := If[er[[n]] == 0, n, er[[n]] = EROPeek[er, er[[n]]];
```

```
In[ ]:= EROAdjoin[er_, new_UndirectedEdge] := EROAdjoin[er, new, Identity];
EROPeek[er_, n1_Integer  $\leftrightarrow$  n2_Integer, comp_] := Module[{m1, m2},
  m1 = EROPeek[er, n1]; m2 = EROPeek[er, n2];
  Switch[Order[{comp[m1], m1}, {comp[m2], m2}], 0, m1, 1, er[[m2]] = m1, -1, er[[m1]] = m2 ]
```

```
In[ ]:= Dynamic[er0]
```

```
Out[ ]:= 
```



```
In[ ]:= EROMake[er0, 10]
```

```
Out[ ]:= {0, 0, 0, 0, 0, 0, 0, 0, 0, 0}
```

```
In[ ]:= EROPeek[er0, 5]
```

```
Out[ ]:= 5
```

```
In[ ]:= EROAdjoin[er0, 3  $\leftrightarrow$  7]
```

```
Out[ ]:= 3
```

```
In[ ]:= EROAdjoin[er0, 3  $\leftrightarrow$  2]
```

```
Out[ ]:= 2
```

```
In[ ]:= EROPeek[er0, 7]
```

```
Out[ ]:= 2
```

```
In[ ]:= EROAdjoin[er0, 8  $\leftrightarrow$  9]
```

```
Out[ ]:= 8
```

```
In[ ]:= EROAdjoin[er0, 7  $\leftrightarrow$  9]
```

```
Out[ ]:= 2
```

```
In[ ]:= Table[EROPeek[er0, i], {i, 10}]
```

```
Out[ ]:= {1, 2, 2, 4, 5, 6, 2, 2, 2, 10}
```

```
In[ ]:= L = 3000000;  
Timing[Do[RandomInteger@{1, L} → RandomInteger@{1, L}, L]]  
Timing[  
  EROMake[er1, L];  
  Do[EROAdjoin[er1, RandomInteger@{1, L} → RandomInteger@{1, L}], L];  
  Count[er1, 0]  
]  
Out[ ]:= {3.34375, Null}  
Out[ ]:= {52.375, 485933}
```