

## 2.8. PROBLEM SET

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**Problem 2.8.8.** Write a program to compute amicable pair as shown in figure 2.45

**Amicable pairs**

Consider the number 220

Find the sum of factors, except the number itself  
(also called **proper divisors**)

$$220 = 1+2+4+5+10+11+20+44+55+110 \\ = 284$$

Now find the sum of factors for 284

$$284 = 1+2+4+71+142 \\ = 220$$

**220 and 284 are called the amicable pairs**

Write a program that prints all the amicable numbers.

objects  
**AmicablePair.java**

Directory

```
public class AmicablePair{
    private int max ;

    public static void main(String[] args) {
        int n = 100000000 ;
        AmicablePair a = new AmicablePair(n)
    }
}
```

Figure 2.45: Finding amicable pairs

### Amicable pairs MAX = 100000000

The following are amicable numbers

0: 220 and 284	204: 66854710 and 71946890
1: 1184 and 1210	205: 67729064 and 69439576
2: 2620 and 2924	206: 67738268 and 79732132
3: 5020 and 5564	207: 68891992 and 78437288
4: 6232 and 6368	208: 71015260 and 85458596
5: 10744 and 10856	209: 71241830 and 78057370
6: 12285 and 14595	210: 72958556 and 74733604
7: 17296 and 18416	211: 73032872 and 78469528
8: 63020 and 76084	212: 74055952 and 78166448
9: 66928 and 66992	213: 74386305 and 87354495
10: 67095 and 71145	214: 74769345 and 82824255
11: 69615 and 87633	215: 75171808 and 77237792
12: 79750 and 88730	216: 75226888 and 81265112
13: 100485 and 124155	217: 78088504 and 88110536
14: 122265 and 139815	218: 78447010 and 80960990
15: 122368 and 123152	219: 79324875 and 87133365
16: 141664 and 153176	220: 80422335 and 82977345
17: 142310 and 168730	221: 83135650 and 85603550
18: 171856 and 176336	222: 84591405 and 89590995
19: 176272 and 180848	223: 86158220 and 99188788
20: 185368 and 203432	224: 89477984 and 92143456
21: 196724 and 202444	225: 90437150 and 94372450
22: 280540 and 365084	226: 91996816 and 93259184
23: 308620 and 389924	227: 93837808 and 99899792
24: 319550 and 430402	228: 95629904 and 97580944
	229: 96304845 and 96747315
	230: 97041735 and 97945785

Run time for n = 100000000 is 19.09 secs

**Can you beat me??**

Figure 2.46: Amicable pairs