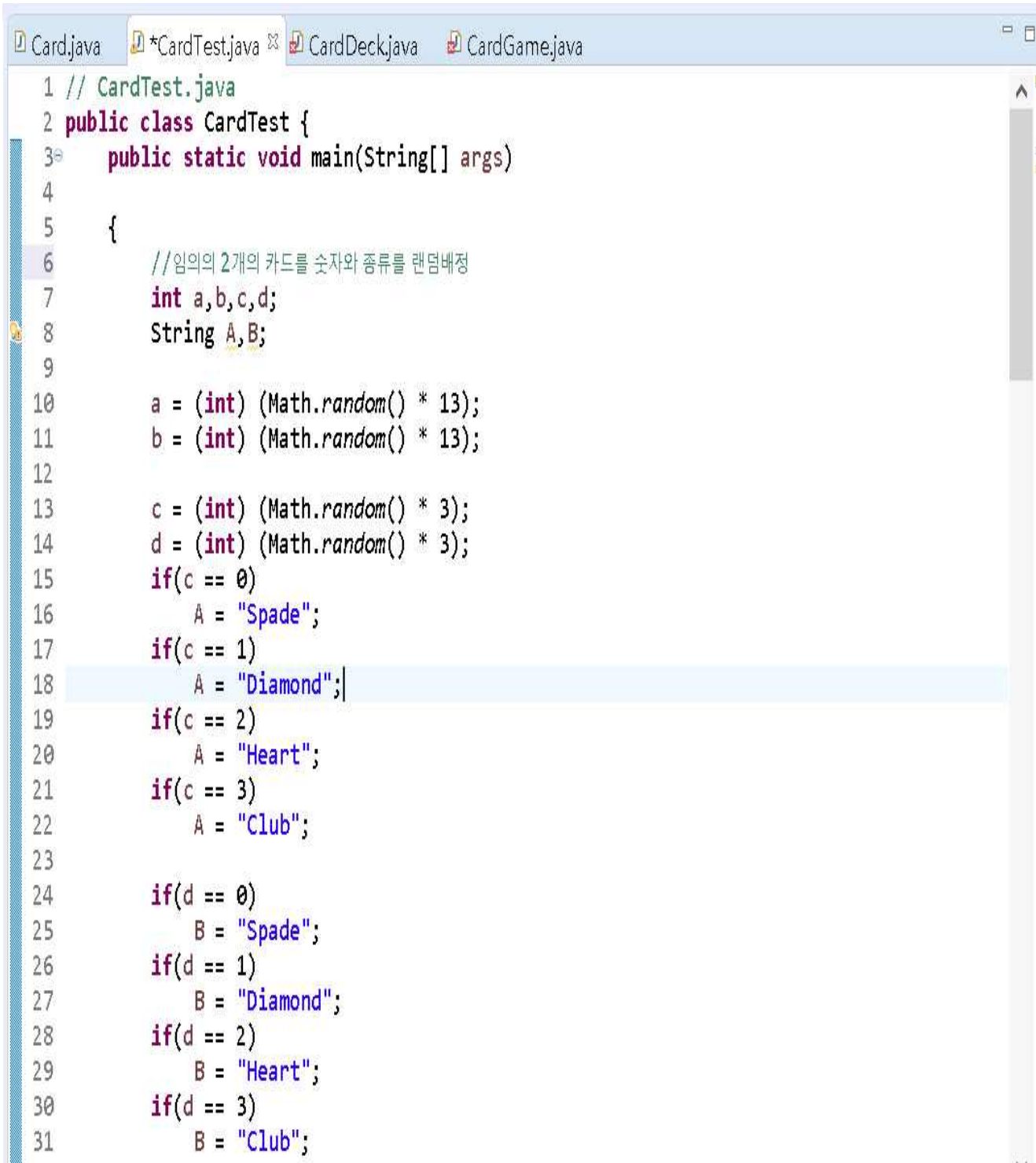


객체지향프로그래밍 -4주차 실습 활동지 (2019년 9월 24일)
성명: 안창희 학과: 소프트웨어 학번: 201723272 반/그룹: 318호

※ 본 실습활동지를 작성함에 있어 다른 학생의 문서로부터 일부 또는 전체를
복사하였습니까
예() 아니오(O) (복사 하였다면 예에 체크하고 아니라면 아니오에 체크하시오)

1. 아래 코드 Card class (Card.java)를 이용하여 물음에 답하시오.
가) 임의의 두 개의 Card 객체를 만든 후 각 카드의 값과 종류를 다음과 같은 형식으로 출력하는
CardTest class(CardTest.java)를 완성하시오. 단, 출력형식은 3주차 실습과제와 동일함. (Hint: 3주차
실습과제에서 작성한 코드 부분을 활용) [CardTest.java 및 실행화면 포함] (2점)



```
1 // CardTest.java
2 public class CardTest {
3     public static void main(String[] args)
4
5     {
6         //임의의 2개의 카드를 숫자와 종류를 랜덤배정
7         int a,b,c,d;
8         String A,B;
9
10        a = (int) (Math.random() * 13);
11        b = (int) (Math.random() * 13);
12
13        c = (int) (Math.random() * 3);
14        d = (int) (Math.random() * 3);
15        if(c == 0)
16            A = "Spade";
17        if(c == 1)
18            A = "Diamond";
19        if(c == 2)
20            A = "Heart";
21        if(c == 3)
22            A = "Club";
23
24        if(d == 0)
25            B = "Spade";
26        if(d == 1)
27            B = "Diamond";
28        if(d == 2)
29            B = "Heart";
30        if(d == 3)
31            B = "Club";
32    }
33 }
```

Card.java *CardTest.java CardDeck.java CardGame.java

```
32
33     Card c1 = new Card(a, "Spade");
34     Card c2 = new Card(b, "Heart");
35
36     String Card1=null;
37     String Card2=null;
38
39     if ((c1.getRank() == 1 || c1.getRank() == 11 || c1.getRank() == 12 || c1.getRank()
40         && (c2.getRank() == 1 || c2.getRank() == 11 || c2.getRank() == 12 || c2.g
41 { //c1의 숫자가 1,11,12,13 이고 동시에 c2의 숫자도 1,11,12,13 일경우
42     if (c1.getRank() == 1)
43         Card1 = "Ace";
44
45     if (c1.getRank() == 11)
46         Card1 = "Jack";
47
48     if (c1.getRank() == 12)
49         Card1 = "Queen";
50
51     if (c1.getRank() == 13)
52         Card1 = "King";
53
54     //c1과 c2의 rank를 표시하는대신 Ace Jack Queen King으로 표시한다
55
56     if (c2.getRank() == 1)
57         Card2 = "Ace";
58
59     if (c2.getRank() == 11)
60         Card2 = "Jack";
61
62     if (c2.getRank() == 12)
63         Card2 = "Queen";
```

```

62         if (c2.getRank() == 12)
63             Card2 = "Queen";
64
65         if (c2.getRank() == 13)
66             Card2 = "King";
67
68
69     }
70
71     else if (c1.getRank() != 1 && c1.getRank() != 11 && c1.getRank() != 12 && c1.getRank() != 13
72             && (c2.getRank() == 1 || c2.getRank() == 11 || c2.getRank() == 12 || c2.getRank() == 13))
73     { //c1의 숫자가 1,11,12,13 이 아니고 동시에 c2의 숫자 1,11,12,13 일경우
74
75         if (c2.getRank() == 1)
76             Card2 = "Ace";
77
78         if (c2.getRank() == 11)
79             Card2 = "Jack";
80
81         if (c2.getRank() == 12)
82             Card2 = "Queen";
83
84         if (c2.getRank() == 13)
85             Card2 = "King";
86
87         //
88         System.out.println(c1.getRank() + " of " + c1.getSuit());
89         System.out.println( Card2 + " of " + c2.getSuit() );
90
91     }
92

```

```
1 // CardTest.java
2 public class CardTest {
3     public static void main(String[] args)
4     {
5         Card c1 = new Card(1, "Spade");
6         Card c2 = new Card(2, "Heart");
7
8         String Card1=null;
9         String Card2=null;
10
11         if ((c1.getRank() == 1 || c1.getRank() == 11 || c1.getRank() == 12 || c1.getRank() == 13)
12             && (c2.getRank() == 1 || c2.getRank() == 11 || c2.getRank() == 12 || c2.getRank() == 13))
13         { //c1의 숫자가 1,11,12,13 이고 동시에 c2의 숫자도 1,11,12,13 일경우
14             if (c1.getRank() == 1)
15                 Card1 = "Ace";
16
17             if (c1.getRank() == 11)
18                 Card1 = "Jack";
19
20             if (c1.getRank() == 12)
21                 Card1 = "Queen";
22
23             if (c1.getRank() == 13)
24                 Card1 = "King";
25
26             if (c2.getRank() == 1)
27                 Card2 = "8";
28
29             if (c2.getRank() == 11)
30                 Card2 = "7";
31
32             if (c2.getRank() == 12)
33                 Card2 = "6";
34
35             if (c2.getRank() == 13)
36                 Card2 = "5";
37
38             if (c2.getRank() == 14)
39                 Card2 = "4";
40
41             if (c2.getRank() == 15)
42                 Card2 = "3";
43
44             if (c2.getRank() == 16)
45                 Card2 = "2";
46
47             if (c2.getRank() == 17)
48                 Card2 = "A";
49
50             if (c2.getRank() == 18)
51                 Card2 = "K";
52
53             if (c2.getRank() == 19)
54                 Card2 = "Q";
55
56             if (c2.getRank() == 20)
57                 Card2 = "J";
58
59             if (c2.getRank() == 21)
60                 Card2 = "10";
61
62             if (c2.getRank() == 22)
63                 Card2 = "9";
64
65             if (c2.getRank() == 23)
66                 Card2 = "8";
67
68             if (c2.getRank() == 24)
69                 Card2 = "7";
70
71             if (c2.getRank() == 25)
72                 Card2 = "6";
73
74             if (c2.getRank() == 26)
75                 Card2 = "5";
76
77             if (c2.getRank() == 27)
78                 Card2 = "4";
79
80             if (c2.getRank() == 28)
81                 Card2 = "3";
82
83             if (c2.getRank() == 29)
84                 Card2 = "2";
85
86             if (c2.getRank() == 30)
87                 Card2 = "A";
88
89             if (c2.getRank() == 31)
90                 Card2 = "K";
91
92             if (c2.getRank() == 32)
93                 Card2 = "Q";
94
95             if (c2.getRank() == 33)
96                 Card2 = "J";
97
98             if (c2.getRank() == 34)
99                 Card2 = "10";
100
101             if (c2.getRank() == 35)
102                 Card2 = "9";
103
104             if (c2.getRank() == 36)
105                 Card2 = "8";
106
107             if (c2.getRank() == 37)
108                 Card2 = "7";
109
110             if (c2.getRank() == 38)
111                 Card2 = "6";
112
113             if (c2.getRank() == 39)
114                 Card2 = "5";
115
116             if (c2.getRank() == 40)
117                 Card2 = "4";
118
119             if (c2.getRank() == 41)
120                 Card2 = "3";
121
122             if (c2.getRank() == 42)
123                 Card2 = "2";
124
125             if (c2.getRank() == 43)
126                 Card2 = "A";
127
128             if (c2.getRank() == 44)
129                 Card2 = "K";
130
131             if (c2.getRank() == 45)
132                 Card2 = "Q";
133
134             if (c2.getRank() == 46)
135                 Card2 = "J";
136
137             if (c2.getRank() == 47)
138                 Card2 = "10";
139
140             if (c2.getRank() == 48)
141                 Card2 = "9";
142
143             if (c2.getRank() == 49)
144                 Card2 = "8";
145
146             if (c2.getRank() == 50)
147                 Card2 = "7";
148
149             if (c2.getRank() == 51)
150                 Card2 = "6";
151
152             if (c2.getRank() == 52)
153                 Card2 = "5";
154
155             if (c2.getRank() == 53)
156                 Card2 = "4";
157
158             if (c2.getRank() == 54)
159                 Card2 = "3";
160
161             if (c2.getRank() == 55)
162                 Card2 = "2";
163
164             if (c2.getRank() == 56)
165                 Card2 = "A";
166
167             if (c2.getRank() == 57)
168                 Card2 = "K";
169
170             if (c2.getRank() == 58)
171                 Card2 = "Q";
172
173             if (c2.getRank() == 59)
174                 Card2 = "J";
175
176             if (c2.getRank() == 60)
177                 Card2 = "10";
178
179             if (c2.getRank() == 61)
180                 Card2 = "9";
181
182             if (c2.getRank() == 62)
183                 Card2 = "8";
184
185             if (c2.getRank() == 63)
186                 Card2 = "7";
187
188             if (c2.getRank() == 64)
189                 Card2 = "6";
190
191             if (c2.getRank() == 65)
192                 Card2 = "5";
193
194             if (c2.getRank() == 66)
195                 Card2 = "4";
196
197             if (c2.getRank() == 67)
198                 Card2 = "3";
199
200             if (c2.getRank() == 68)
201                 Card2 = "2";
202
203             if (c2.getRank() == 69)
204                 Card2 = "A";
205
206             if (c2.getRank() == 70)
207                 Card2 = "K";
208
209             if (c2.getRank() == 71)
210                 Card2 = "Q";
211
212             if (c2.getRank() == 72)
213                 Card2 = "J";
214
215             if (c2.getRank() == 73)
216                 Card2 = "10";
217
218             if (c2.getRank() == 74)
219                 Card2 = "9";
220
221             if (c2.getRank() == 75)
222                 Card2 = "8";
223
224             if (c2.getRank() == 76)
225                 Card2 = "7";
226
227             if (c2.getRank() == 77)
228                 Card2 = "6";
229
230             if (c2.getRank() == 78)
231                 Card2 = "5";
232
233             if (c2.getRank() == 79)
234                 Card2 = "4";
235
236             if (c2.getRank() == 80)
237                 Card2 = "3";
238
239             if (c2.getRank() == 81)
240                 Card2 = "2";
241
242             if (c2.getRank() == 82)
243                 Card2 = "A";
244
245             if (c2.getRank() == 83)
246                 Card2 = "K";
247
248             if (c2.getRank() == 84)
249                 Card2 = "Q";
250
251             if (c2.getRank() == 85)
252                 Card2 = "J";
253
254             if (c2.getRank() == 86)
255                 Card2 = "10";
256
257             if (c2.getRank() == 87)
258                 Card2 = "9";
259
260             if (c2.getRank() == 88)
261                 Card2 = "8";
262
263             if (c2.getRank() == 89)
264                 Card2 = "7";
265
266             if (c2.getRank() == 90)
267                 Card2 = "6";
268
269             if (c2.getRank() == 91)
270                 Card2 = "5";
271
272             if (c2.getRank() == 92)
273                 Card2 = "4";
274
275             if (c2.getRank() == 93)
276                 Card2 = "3";
277
278             if (c2.getRank() == 94)
279                 Card2 = "2";
280
281             if (c2.getRank() == 95)
282                 Card2 = "A";
283
284             if (c2.getRank() == 96)
285                 Card2 = "K";
286
287             if (c2.getRank() == 97)
288                 Card2 = "Q";
289
290             if (c2.getRank() == 98)
291                 Card2 = "J";
292
293             if (c2.getRank() == 99)
294                 Card2 = "10";
295
296             if (c2.getRank() == 100)
297                 Card2 = "9";
298
299             if (c2.getRank() == 101)
300                 Card2 = "8";
301
302             if (c2.getRank() == 102)
303                 Card2 = "7";
304
305             if (c2.getRank() == 103)
306                 Card2 = "6";
307
308             if (c2.getRank() == 104)
309                 Card2 = "5";
310
311             if (c2.getRank() == 105)
312                 Card2 = "4";
313
314             if (c2.getRank() == 106)
315                 Card2 = "3";
316
317             if (c2.getRank() == 107)
318                 Card2 = "2";
319
320             if (c2.getRank() == 108)
321                 Card2 = "A";
322
323             if (c2.getRank() == 109)
324                 Card2 = "K";
325
326             if (c2.getRank() == 110)
327                 Card2 = "Q";
328
329             if (c2.getRank() == 111)
330                 Card2 = "J";
331
332             if (c2.getRank() == 112)
333                 Card2 = "10";
334
335             if (c2.getRank() == 113)
336                 Card2 = "9";
337
338             if (c2.getRank() == 114)
339                 Card2 = "8";
340
341             if (c2.getRank() == 115)
342                 Card2 = "7";
343
344             if (c2.getRank() == 116)
345                 Card2 = "6";
346
347             if (c2.getRank() == 117)
348                 Card2 = "5";
349
350             if (c2.getRank() == 118)
351                 Card2 = "4";
352
353             if (c2.getRank() == 119)
354                 Card2 = "3";
355
356             if (c2.getRank() == 120)
357                 Card2 = "2";
358
359             if (c2.getRank() == 121)
360                 Card2 = "A";
361
362             if (c2.getRank() == 122)
363                 Card2 = "K";
364
365             if (c2.getRank() == 123)
366                 Card2 = "Q";
367
368             if (c2.getRank() == 124)
369                 Card2 = "J";
370
371             if (c2.getRank() == 125)
372                 Card2 = "10";
373
374             if (c2.getRank() == 126)
375                 Card2 = "9";
376
377             if (c2.getRank() == 127)
378                 Card2 = "8";
379
380             if (c2.getRank() == 128)
381                 Card2 = "7";
382
383             if (c2.getRank() == 129)
384                 Card2 = "6";
385
386             if (c2.getRank() == 130)
387                 Card2 = "5";
388
389             if (c2.getRank() == 131)
390                 Card2 = "4";
391
392             if (c2.getRank() == 132)
393                 Card2 = "3";
394
395             if (c2.getRank() == 133)
396                 Card2 = "2";
397
398             if (c2.getRank() == 134)
399                 Card2 = "A";
400
401             if (c2.getRank() == 135)
402                 Card2 = "K";
403
404             if (c2.getRank() == 136)
405                 Card2 = "Q";
406
407             if (c2.getRank() == 137)
408                 Card2 = "J";
409
410             if (c2.getRank() == 138)
411                 Card2 = "10";
412
413             if (c2.getRank() == 139)
414                 Card2 = "9";
415
416             if (c2.getRank() == 140)
417                 Card2 = "8";
418
419             if (c2.getRank() == 141)
420                 Card2 = "7";
421
422             if (c2.getRank() == 142)
423                 Card2 = "6";
424
425             if (c2.getRank() == 143)
426                 Card2 = "5";
427
428             if (c2.getRank() == 144)
429                 Card2 = "4";
430
431             if (c2.getRank() == 145)
432                 Card2 = "3";
433
434             if (c2.getRank() == 146)
435                 Card2 = "2";
436
437             if (c2.getRank() == 147)
438                 Card2 = "A";
439
440             if (c2.getRank() == 148)
441                 Card2 = "K";
442
443             if (c2.getRank() == 149)
444                 Card2 = "Q";
445
446             if (c2.getRank() == 150)
447                 Card2 = "J";
448
449             if (c2.getRank() == 151)
450                 Card2 = "10";
451
452             if (c2.getRank() == 152)
453                 Card2 = "9";
454
455             if (c2.getRank() == 153)
456                 Card2 = "8";
457
458             if (c2.getRank() == 154)
459                 Card2 = "7";
460
461             if (c2.getRank() == 155)
462                 Card2 = "6";
463
464             if (c2.getRank() == 156)
465                 Card2 = "5";
466
467             if (c2.getRank() == 157)
468                 Card2 = "4";
469
470             if (c2.getRank() == 158)
471                 Card2 = "3";
472
473             if (c2.getRank() == 159)
474                 Card2 = "2";
475
476             if (c2.getRank() == 160)
477                 Card2 = "A";
478
479             if (c2.getRank() == 161)
480                 Card2 = "K";
481
482             if (c2.getRank() == 162)
483                 Card2 = "Q";
484
485             if (c2.getRank() == 163)
486                 Card2 = "J";
487
488             if (c2.getRank() == 164)
489                 Card2 = "10";
490
491             if (c2.getRank() == 165)
492                 Card2 = "9";
493
494             if (c2.getRank() == 166)
495                 Card2 = "8";
496
497             if (c2.getRank() == 167)
498                 Card2 = "7";
499
500             if (c2.getRank() == 168)
501                 Card2 = "6";
502
503             if (c2.getRank() == 169)
504                 Card2 = "5";
505
506             if (c2.getRank() == 170)
507                 Card2 = "4";
508
509             if (c2.getRank() == 171)
509                 Card2 = "3";
510
511             if (c2.getRank() == 172)
512                 Card2 = "2";
513
514             if (c2.getRank() == 173)
515                 Card2 = "A";
516
517             if (c2.getRank() == 174)
518                 Card2 = "K";
519
520             if (c2.getRank() == 175)
521                 Card2 = "Q";
522
523             if (c2.getRank() == 176)
524                 Card2 = "J";
525
526             if (c2.getRank() == 177)
527                 Card2 = "10";
528
529             if (c2.getRank() == 178)
529                 Card2 = "9";
530
531             if (c2.getRank() == 179)
532                 Card2 = "8";
533
534             if (c2.getRank() == 180)
535                 Card2 = "7";
536
537             if (c2.getRank() == 181)
538                 Card2 = "6";
539
540             if (c2.getRank() == 182)
541                 Card2 = "5";
542
543             if (c2.getRank() == 183)
544                 Card2 = "4";
545
546             if (c2.getRank() == 184)
547                 Card2 = "3";
548
549             if (c2.getRank() == 185)
549                 Card2 = "2";
550
551             if (c2.getRank() == 186)
552                 Card2 = "A";
553
554             if (c2.getRank() == 187)
555                 Card2 = "K";
556
557             if (c2.getRank() == 188)
558                 Card2 = "Q";
559
560             if (c2.getRank() == 189)
560                 Card2 = "J";
561
562             if (c2.getRank() == 190)
563                 Card2 = "10";
564
565             if (c2.getRank() == 191)
566                 Card2 = "9";
567
568             if (c2.getRank() == 192)
569                 Card2 = "8";
569             if (c2.getRank() == 193)
570                 Card2 = "7";
570             if (c2.getRank() == 194)
571                 Card2 = "6";
571             if (c2.getRank() == 195)
572                 Card2 = "5";
572             if (c2.getRank() == 196)
573                 Card2 = "4";
573             if (c2.getRank() == 197)
574                 Card2 = "3";
574             if (c2.getRank() == 198)
575                 Card2 = "2";
575             if (c2.getRank() == 199)
576                 Card2 = "A";
576             if (c2.getRank() == 200)
577                 Card2 = "K";
577             if (c2.getRank() == 201)
578                 Card2 = "Q";
578             if (c2.getRank() == 202)
579                 Card2 = "J";
579             if (c2.getRank() == 203)
580                 Card2 = "10";
580             if (c2.getRank() == 204)
581                 Card2 = "9";
581             if (c2.getRank() == 205)
582                 Card2 = "8";
582             if (c2.getRank() == 206)
583                 Card2 = "7";
583             if (c2.getRank() == 207)
584                 Card2 = "6";
584             if (c2.getRank() == 208)
585                 Card2 = "5";
585             if (c2.getRank() == 209)
586                 Card2 = "4";
586             if (c2.getRank() == 210)
587                 Card2 = "3";
587             if (c2.getRank() == 211)
588                 Card2 = "2";
588             if (c2.getRank() == 212)
589                 Card2 = "A";
589             if (c2.getRank() == 213)
590                 Card2 = "K";
590             if (c2.getRank() == 214)
591                 Card2 = "Q";
591             if (c2.getRank() == 215)
592                 Card2 = "J";
592             if (c2.getRank() == 216)
593                 Card2 = "10";
593             if (c2.getRank() == 217)
594                 Card2 = "9";
594             if (c2.getRank() == 218)
595                 Card2 = "8";
595             if (c2.getRank() == 219)
596                 Card2 = "7";
596             if (c2.getRank() == 220)
597                 Card2 = "6";
597             if (c2.getRank() == 221)
598                 Card2 = "5";
598             if (c2.getRank() == 222)
599                 Card2 = "4";
599             if (c2.getRank() == 223)
600                 Card2 = "3";
600             if (c2.getRank() == 224)
601                 Card2 = "2";
601             if (c2.getRank() == 225)
602                 Card2 = "A";
602             if (c2.getRank() == 226)
603                 Card2 = "K";
603             if (c2.getRank() == 227)
604                 Card2 = "Q";
604             if (c2.getRank() == 228)
605                 Card2 = "J";
605             if (c2.getRank() == 229)
606                 Card2 = "10";
606             if (c2.getRank() == 230)
607                 Card2 = "9";
607             if (c2.getRank() == 231)
608                 Card2 = "8";
608             if (c2.getRank() == 232)
609                 Card2 = "7";
609             if (c2.getRank() == 233)
610                 Card2 = "6";
610             if (c2.getRank() == 234)
611                 Card2 = "5";
611             if (c2.getRank() == 235)
612                 Card2 = "4";
612             if (c2.getRank() == 236)
613                 Card2 = "3";
613             if (c2.getRank() == 237)
614                 Card2 = "2";
614             if (c2.getRank() == 238)
615                 Card2 = "A";
615             if (c2.getRank() == 239)
616                 Card2 = "K";
616             if (c2.getRank() == 240)
617                 Card2 = "Q";
617             if (c2.getRank() == 241)
618                 Card2 = "J";
618             if (c2.getRank() == 242)
619                 Card2 = "10";
619             if (c2.getRank() == 243)
620                 Card2 = "9";
620             if (c2.getRank() == 244)
621                 Card2 = "8";
621             if (c2.getRank() == 245)
622                 Card2 = "7";
622             if (c2.getRank() == 246)
623                 Card2 = "6";
623             if (c2.getRank() == 247)
624                 Card2 = "5";
624             if (c2.getRank() == 248)
625                 Card2 = "4";
625             if (c2.getRank() == 249)
626                 Card2 = "3";
626             if (c2.getRank() == 250)
627                 Card2 = "2";
627             if (c2.getRank() == 251)
628                 Card2 = "A";
628             if (c2.getRank() == 252)
629                 Card2 = "K";
629             if (c2.getRank() == 253)
630                 Card2 = "Q";
630             if (c2.getRank() == 254)
631                 Card2 = "J";
631             if (c2.getRank() == 255)
632                 Card2 = "10";
632             if (c2.getRank() == 256)
633                 Card2 = "9";
633             if (c2.getRank() == 257)
634                 Card2 = "8";
634             if (c2.getRank() == 258)
635                 Card2 = "7";
635             if (c2.getRank() == 259)
636                 Card2 = "6";
636             if (c2.getRank() == 260)
637                 Card2 = "5";
637             if (c2.getRank() == 261)
638                 Card2 = "4";
638             if (c2.getRank() == 262)
639                 Card2 = "3";
639             if (c2.getRank() == 263)
640                 Card2 = "2";
640             if (c2.getRank() == 264)
641                 Card2 = "A";
641             if (c2.getRank() == 265)
642                 Card2 = "K";
642             if (c2.getRank() == 266)
643                 Card2 = "Q";
643             if (c2.getRank() == 267)
644                 Card2 = "J";
644             if (c2.getRank() == 268)
645                 Card2 = "10";
645             if (c2.getRank() == 269)
646                 Card2 = "9";
646             if (c2.getRank() == 270)
647                 Card2 = "8";
647             if (c2.getRank() == 271)
648                 Card2 = "7";
648             if (c2.getRank() == 272)
649                 Card2 = "6";
649             if (c2.getRank() == 273)
650                 Card2 = "5";
650             if (c2.getRank() == 274)
651                 Card2 = "4";
651             if (c2.getRank() == 275)
652                 Card2 = "3";
652             if (c2.getRank() == 276)
653                 Card2 = "2";
653             if (c2.getRank() == 277)
654                 Card2 = "A";
654             if (c2.getRank() == 278)
655                 Card2 = "K";
655             if (c2.getRank() == 279)
656                 Card2 = "Q";
656             if (c2.getRank() == 280)
657                 Card2 = "J";
657             if (c2.getRank() == 281)
658                 Card2 = "10";
658             if (c2.getRank() == 282)
659                 Card2 = "9";
659             if (c2.getRank() == 283)
660                 Card2 = "8";
660             if (c2.getRank() == 284)
661                 Card2 = "7";
661             if (c2.getRank() == 285)
662                 Card2 = "6";
662             if (c2.getRank() == 286)
663                 Card2 = "5";
663             if (c2.getRank() == 287)
664                 Card2 = "4";
664             if (c2.getRank() == 288)
665                 Card2 = "3";
665             if (c2.getRank() == 289)
666                 Card2 = "2";
666             if (c2.getRank() == 290)
667                 Card2 = "A";
667             if (c2.getRank() == 291)
668                 Card2 = "K";
668             if (c2.getRank() == 292)
669                 Card2 = "Q";
669             if (c2.getRank() == 293)
670                 Card2 = "J";
670             if (c2.getRank() == 294)
671                 Card2 = "10";
671             if (c2.getRank() == 295)
672                 Card2 = "9";
672             if (c2.getRank() == 296)
673                 Card2 = "8";
673             if (c2.getRank() == 297)
674                 Card2 = "7";
674             if (c2.getRank() == 298)
675                 Card2 = "6";
675             if (c2.getRank() == 299)
676                 Card2 = "5";
676             if (c2.getRank() == 300)
677                 Card2 = "4";
677             if (c2.getRank() == 301)
678                 Card2 = "3";
678             if (c2.getRank() == 302)
679                 Card2 = "2";
679             if (c2.getRank() == 303)
680                 Card2 = "A";
680             if (c2.getRank() == 304)
681                 Card2 = "K";
681             if (c2.getRank() == 305)
682                 Card2 = "Q";
682             if (c2.getRank() == 306)
683                 Card2 = "J";
683             if (c2.getRank() == 307)
684                 Card2 = "10";
684             if (c2.getRank() == 308)
685                 Card2 = "9";
685             if (c2.getRank() == 309)
686                 Card2 = "8";
686             if (c2.getRank() == 310)
687                 Card2 = "7";
687             if (c2.getRank() == 311)
688                 Card2 = "6";
688             if (c2.getRank() == 312)
689                 Card2 = "5";
689             if (c2.getRank() == 313)
690                 Card2 = "4";
690             if (c2.getRank() == 314)
691                 Card2 = "3";
691             if (c2.getRank() == 315)
692                 Card2 = "2";
692             if (c2.getRank() == 316)
693                 Card2 = "A";
693             if (c2.getRank() == 317)
694                 Card2 = "K";
694             if (c2.getRank() == 318)
695                 Card2 = "Q";
695             if (c2.getRank() == 319)
696                 Card2 = "J";
696             if (c2.getRank() == 320)
697                 Card2 = "10";
697             if (c2.getRank() == 321)
698                 Card2 = "9";
698             if (c2.getRank() == 322)
699                 Card2 = "8";
699             if (c2.getRank() == 323)
700                 Card2 = "7";
700             if (c2.getRank() == 324)
701                 Card2 = "6";
701             if (c2.getRank() == 325)
702                 Card2 = "5";
702             if (c2.getRank() == 326)
703                 Card2 = "4";
703             if (c2.getRank() == 327)
704                 Card2 = "3";
704             if (c2.getRank() == 328)
705                 Card2 = "2";
705             if (c2.getRank() == 329)
706                 Card2 = "A";
706             if (c2.getRank() == 330)
707                 Card2 = "K";
707             if (c2.getRank() == 331)
708                 Card2 = "Q";
708             if (c2.getRank() == 332)
709                 Card2 = "J";
709             if (c2.getRank() == 333)
710                 Card2 = "10";
710             if (c2.getRank() == 334)
711                 Card2 = "9";
711             if (c2.getRank() == 335)
712                 Card2 = "8";
712             if (c2.getRank() == 336)
713                 Card2 = "7";
713             if (c2.getRank() == 337)
714                 Card2 = "6";
714             if (c2.getRank() == 338)
715                 Card2 = "5";
715             if (c2.getRank() == 339)
716                 Card2 = "4";
716             if (c2.getRank() == 340)
717                 Card2 = "3";
717             if (c2.getRank() == 341)
718                 Card2 = "2";
718             if (c2.getRank() == 342)
719                 Card2 = "A";
719             if (c2.getRank() == 343)
720                 Card2 = "K";
720             if (c2.getRank() == 344)
721                 Card2 = "Q";
721             if (c2.getRank() == 345)
722                 Card2 = "J";
722             if (c2.getRank() == 346)
723                 Card2 = "10";
723             if (c2.getRank() == 347)
724                 Card2 = "9";
724             if (c2.getRank() == 348)
725                 Card2 = "8";
725             if (c2.getRank() == 349)
726                 Card2 = "7";
726             if (c2.getRank() == 350)
727                 Card2 = "6";
727             if (c2.getRank() == 351)
728                 Card2 = "5";
728             if (c2.getRank() == 352)
729                 Card2 = "4";
729             if (c2.getRank() == 353)
730                 Card2 = "3";
730             if (c2.getRank() == 354)
731                 Card2 = "2";
731             if (c2.getRank() == 355)
732                 Card2 = "A";
732             if (c2.getRank() == 356)
733                 Card2 = "K";
733             if (c2.getRank() == 357)
734                 Card2 = "Q";
734             if (c2.getRank() == 358)
735                 Card2 = "J";
735             if (c2.getRank() == 359)
736                 Card2 = "10";
736             if (c2.getRank() == 360)
737                 Card2 = "9";
737             if (c2.getRank() == 361)
738                 Card2 = "8";
738             if (c2.getRank() == 362)
739                 Card2 = "7";
739             if (c2.getRank() == 363)
740                 Card2 = "6";
740             if (c2.getRank() == 364)
741                 Card2 = "5";
741             if (c2.getRank() == 365)
742                 Card2 = "4";
742             if (c2.getRank() == 366)
743                 Card2 = "3";
743             if (c2.getRank() == 367)
744                 Card2 = "2";
744             if (c2.getRank() == 368)
745                 Card2 = "A";
745             if (c2.getRank() == 369)
746                 Card2 = "K";
746             if (c2.getRank() == 370)
747                 Card2 = "Q";
747             if (c2.getRank() == 371)
748                 Card2 = "J";
748             if (c2.getRank() == 372)
749                 Card2 = "10";
749             if (c2.getRank() == 373)
750                 Card2 = "9";
750             if (c2.getRank() == 374)
751                 Card2 = "8";
751             if (c2.getRank() == 375)
752                 Card2 = "7";
752             if (c2.getRank() == 376)
753                 Card2 = "6";
753             if (c2.getRank() == 377)
754                 Card2 = "5";
754             if (c2.getRank() == 378)
755                 Card2 = "4";
755             if (c2.getRank() == 379)
756                 Card2 = "3";
756             if (c2.getRank() == 380)
757                 Card2 = "2";
757             if (c2.getRank() == 381)
758                 Card2 = "A";
758             if (c2.getRank() == 382)
759                 Card2 = "K";
759             if (c2.getRank() == 383)
760                 Card2 = "Q";
760             if (c2.getRank() == 384)
761                 Card2 = "J";
761             if (c2.getRank() == 385)
762                 Card2 = "10";
762             if (c2.getRank() == 386)
763                 Card2 = "9";
763             if (c2.getRank() == 387)
764                 Card2 = "8";
764             if (c2.getRank() == 388)
765                 Card2 = "7";
765             if (c2.getRank() == 389)
766                 Card2 = "6";
766             if (c2.getRank() == 390)
767                 Card2 = "5";
767             if (c2.getRank() == 391)
768                 Card2 = "4";
768             if (c2.getRank() == 392)
769                 Card2 = "3";
769             if (c2.getRank() == 393)
770                 Card2 = "2";
770             if (c2.getRank() == 394)
771                 Card2 = "A";
771             if (c2.getRank() == 395)
772                 Card2 = "K";
772             if (c2.getRank() == 396)
773                 Card2 = "Q";
773             if (c2.getRank() == 397)
774                 Card2 = "J";
774             if (c2.getRank() == 398)
775                 Card2 = "10";
775             if (c2.getRank() == 399)
776                 Card2 = "9";
776             if (c2.getRank() == 400)
777                 Card2 = "8";
777             if (c2.getRank
```

나) (가)의 CardTest class를 아래와 같이 수정하여 (가)와 동일한 작업을 수행할 수 있도록 Card class에 다음과 같은 toString() method를 추가하시오. toString()은 카드의 내용을 (가)번의 출력 형식과 같이 하나의 String으로 만들어 반환하는 함수이다. [toString() 메소드 및 CardTest.java 코드와 실행화면 포함] (3점)

```
19 public String toString() {
20     String str = null;
21     // fill in the code here
22     if (rank == 1 || rank == 11 || rank == 12 || rank == 13) {
23         if (rank == 1) {
24             str = "Ace";
25         }
26
27         if (rank == 11) {
28             str = "Jack";
29         }
30
31         if (rank == 12) {
32             str = "Queen";
33         }
34
35         if (rank == 13) {
36             str = "King";
37         }
38     }
39
40     else
41         str = String.valueOf(rank);
42
43     return str;
44 }
45 }
```

The screenshot shows an IDE with the following components:

- Package Explorer:** Shows a project named 'practice1' with a source folder 'src' containing files 'Card.java', 'CardDeck.java', 'CardGame.java', and 'CardTest.java'. The 'JRE System Library [jdk-11.0.2]' is also listed.
- Editor:** Displays the 'CardTest.java' file with the following code:

```
1 // CardTest.java
2 public class CardTest {
3
4     public static void main(String[] args) {
5         Card c1 = new Card(1, "Spade");
6         Card c2 = new Card(2, "Heart");
7         System.out.println(c1.toString());
8         System.out.println(c2.toString());
9     }
10 }
```
- Console:** Shows the output of the program:

```
<terminated> CardTest [Java Application] C:\openjdk-11.0.2_windows-x64_bin\jdk-11.0.2\bin\java.exe
Ace
2
```


다) (나)에서 작성한 Card class에 compareTo() method를 추가하고자 한다. compareTo() method는 하나의 Card object를 parameter로 받아 자신과 비교하여 자신보다 크면 1, 동일하면 0, 더 작으면 -1을 반환한다. 아래 주어진 CardTest.java를 이용하여 compareTo()가 제대로 작동하는지 확인하시오. 단, 카드의 순위는 3주차 실습과제와 동일하다. (Hint: 3주차 실습과제에서 작성한 코드 부분을 활용) [compareTo() method 및 실행화면 포함] (3점)

```

46 public int compareTo(Card B) {
47     int result = 0; //결과는 무승부 0 / A승리 -1 / B승리 1 세가지로 약속함, 일단 0으로 초기화
48
49     //두 카드의 숫자를 비교
50     if(this.rank > B.rank) //a의 숫자가 클 경우 => a승리
51     {
52         result = -1;
53     }
54
55     else if(this.rank < B.rank) //b의 숫자가 클 경우 => b승리
56     {
57         result = 1;
58     }
59
60     else if(this.rank == B.rank) //a와 b의 숫자가 같은경우
61     {
62         if(this.suit == "Spade") //a의 종류가 스페이드면 => a승리
63             result = -1;
64
65         if(this.suit == "Diamond") //a의 종류가 다이아몬드일경우
66         {
67             if(B.suit == "Spade") //b가 스페이드면 => b승리
68                 result = 1;
69
70             else if(B.suit == "Diamond") //중복된 다이아몬드가 나올 경우 => 무승부
71                 result = 0;
72             else //b가 다이아, 스페이드가 아니면 a의 승리
73                 result = -1;
74         }
75
76         if(this.suit == "Heart") //a의 종류가 하트일경우
77         {
78             if(B.suit == "Spade" || B.suit == "Diamond") //b가 스페이드or다이아몬드면 => b승리
79                 result = -1;
80
81             else if(B.suit == "Heart")
82                 result = 0;
83
84             else //b가 클럽일경우=> a승리
85                 result = 0;
86         }
87
88         else if (this.suit == "Club") //a의 종류가 클럽일경우
89             if (B.suit == "Club") //b도 클럽이면 무승부
90                 result = 0;
91             else result = -1; // => 나머지경우 b의 승리
92     }
93     //두 카드의 종류를 비교
94     return result;

```

결과화면

The screenshot displays an IDE interface with a project explorer on the left and a code editor on the right. The project explorer shows a project named 'practice1' with a 'src' folder containing several Java files, including 'CardTest.java'. The code editor shows the content of 'CardTest.java', which is a Java class with a 'main' method. The code creates two 'Card' objects, 'c1' (Heart) and 'c2' (Spade), and compares them using the 'compareTo' method. The output of the program is shown in the 'Console' tab at the bottom, indicating that 'c2' wins 'c1'.

```
1 // CardTest.java
2 public class CardTest {
3     public static void main(String[] args)
4     {
5         Card c1 = new Card(1, "Heart");
6         Card c2 = new Card(2, "Spade");
7         System.out.println(c1.toString());
8         System.out.println(c2.toString());
9         int result = c1.compareTo(c2);
10    if(result > 0)
11    System.out.println(c2.toString()+" wins "+c1.toString());
12    else if(result < 0)
13    System.out.println(c1.toString()+" wins "+c2.toString());
14    else
15    System.out.println(c1.toString()+" ties to "+c2.toString());
16    }
17 }
```

<terminated> CardTest [Java Application] C:\w\openjdk-11.0.2_windows-x64_bin\jdk-11.0.2\bin\javaw.exe (2019. 9. 30. 오후 6:37:5
Ace
2
2 wins Ace

2. 1번 문제에서 정의한 Card class (Card.java)를 이용하여 Card object 52개를 가지는 CardDeck class를 정의하고자 한다. 다음 물음에 답하시오.

가) CardDeck class에서 Card 52장을 생성하여 초기화하는 constructor와 shuffle() method, card deck에서 순서대로 하나의 Card object를 반환하는 dealCard() method를 완성하시오. (Hint: 3주차 실습과제에서 작성한 코드 부분을 활용) [CardDeck 코드 포함] (6점)

```
Card.java ~ CardDeck.java ~ CardTest.java ~ CardGame.java ~ asdasd.java
1 // CardDeck.java
2 public class CardDeck
3 {
4     Card[] deck;
5     int top; // card deck의 현재 deal할 card 위치
6
7     public CardDeck()
8     {
9         top = 0;
10        deck = new Card[52]; //deck 이라는 이름의 카드 52개에 대한 52개의 레퍼런스 생성
11
12        // fill in the code here
13
14        // 숫자 1 2 3 ... n 으로 배열에 값을 지정
15
16
17        for (int i = 0; i < deck.length; i++)
18        {
19            deck[i] = new Card(i+1, "Spade" );
20        }
21
22
23        for(int i =13 ; i <26 ; i++)
24        {
25            deck[i] = new Card (deck[i].getRank()-13, "Diamond");
26        }
27
28
```

```
Card.java ~ CardDeck.java ~ CardTest.java ~ CardGame.java ~ asdasd.java
27     }
28
29     for(int i =26 ; i <39 ; i++)
30     {
31         deck[i] = new Card(deck[i].getRank()- 26, "Heart");
32     }
33
34
35     for(int i =39 ; i <52 ; i++)
36     {
37         deck[i] = new Card(deck[i].rank-39, "Club");
38     }
39
40     top = 51;
41 }
42
43
```



```

45
46 public void shuffle()
47 {
48     // fill in the code here
49     int TempRank;
50     String TempSuit;
51
52     for(int i=0 ; i<this.deck.length ; i++) //0번째 칸부터 51번째 칸까지의 모든 원소에겐 한번씩 실행
53     {
54         int RandomNum = (int) (Math.random() * 51);
55
56         TempRank = this.deck[i].getRank(); //i번째 칸 원소의 rank와 suit를 임시저장
57         TempSuit = this.deck[i].getSuit();
58
59         this.deck[i].setRank (this.deck[RandomNum].getRank()) ; //i번째 칸 원소의 rank와 suit값을 RandomNum번째 값으로 대체
60         this.deck[i].setSuit (this.deck[RandomNum].getSuit() );
61
62         this.deck[RandomNum].setRank(TempRank); //RandomNum번째 원소를 아까 임시저장한 값으로 대체
63         this.deck[RandomNum].setSuit(TempSuit);
64     }
65 }
66
67
68
69 public void setRank(int R) {
70     this.rank = R;
71     return;
72 }
73
74 public void setSuit(String S) {
75     this.suit = S;
76     return;
77 }
78

```


shuffle 의 알고리즘을 구현하기 위해 Card class에 set 기능의 method를 추가하였다

```

79 public Card dealCard()
80 {
81     // fill in the code here
82
83     return this.deck[top--];
84 }

```

나) 다음 CardGame.java를 실행하여 CardDeck class를 확인해보시오. [실행화면] (1점)



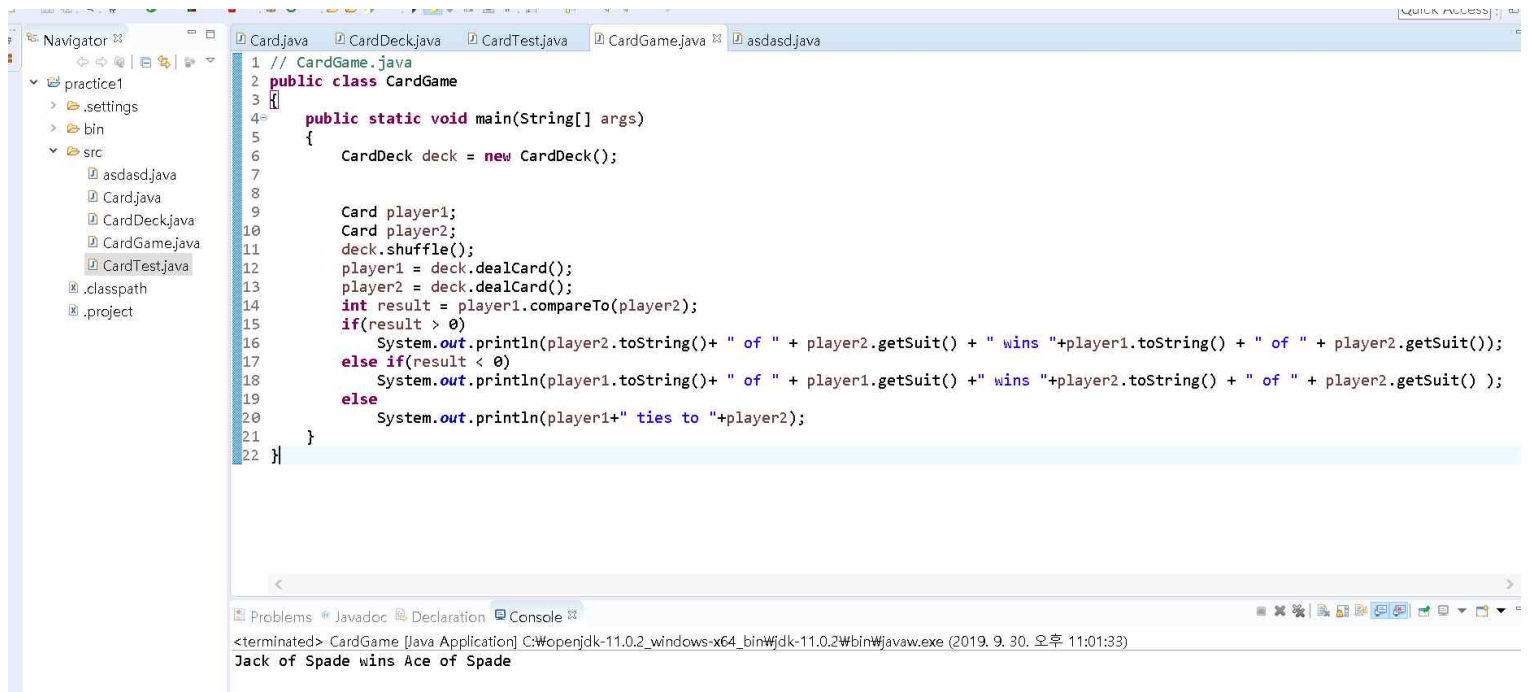
The screenshot shows an IDE with a project named 'practice1'. The 'src' folder contains several Java files: 'asdasd.java', 'Card.java', 'CardDeck.java', 'CardGame.java', and 'CardTest.java'. The 'CardGame.java' file is open and shows the following code:

```
1 // CardGame.java
2 public class CardGame
3 {
4     public static void main(String[] args)
5     {
6         CardDeck deck = new CardDeck();
7
8         Card player1;
9         Card player2;
10        deck.shuffle();
11        player1 = deck.dealCard();
12        player2 = deck.dealCard();
13        int result = player1.compareTo(player2);
14        if(result > 0)
15            System.out.println(player2.toString()+" wins "+player1.toString());
16        else if(result < 0)
17            System.out.println(player1.toString()+" wins "+player2.toString());
18        else
19            System.out.println(player1+" ties to "+player2);
20    }
21 }
22 }
```

Below the code editor, the 'Console' tab is active, showing the output of the program:

```
<terminated> CardGame [Java Application] C:\openjdk-11.0.2_windows-x64_bin\jdk-11.0.2\bin\javaw.exe (2019. 9. 30.
9 wins 8
```

결과



The screenshot shows the same IDE with the 'CardGame.java' file open. The code has been updated to include the 'getSuit()' method for the Card class. The updated code is as follows:

```
1 // CardGame.java
2 public class CardGame
3 {
4     public static void main(String[] args)
5     {
6         CardDeck deck = new CardDeck();
7
8         Card player1;
9         Card player2;
10        deck.shuffle();
11        player1 = deck.dealCard();
12        player2 = deck.dealCard();
13        int result = player1.compareTo(player2);
14        if(result > 0)
15            System.out.println(player2.toString()+" of " + player2.getSuit() + " wins "+player1.toString() + " of " + player2.getSuit());
16        else if(result < 0)
17            System.out.println(player1.toString()+" of " + player1.getSuit() + " wins "+player2.toString() + " of " + player2.getSuit() );
18        else
19            System.out.println(player1+" ties to "+player2);
20    }
21 }
22 }
```

The 'Console' tab shows the output of the program:

```
<terminated> CardGame [Java Application] C:\openjdk-11.0.2_windows-x64_bin\jdk-11.0.2\bin\javaw.exe (2019. 9. 30. 오후 11:01:33)
Jack of Spade wins Ace of Spade
```

of 의 표현을 추가하여 구현한 결과

