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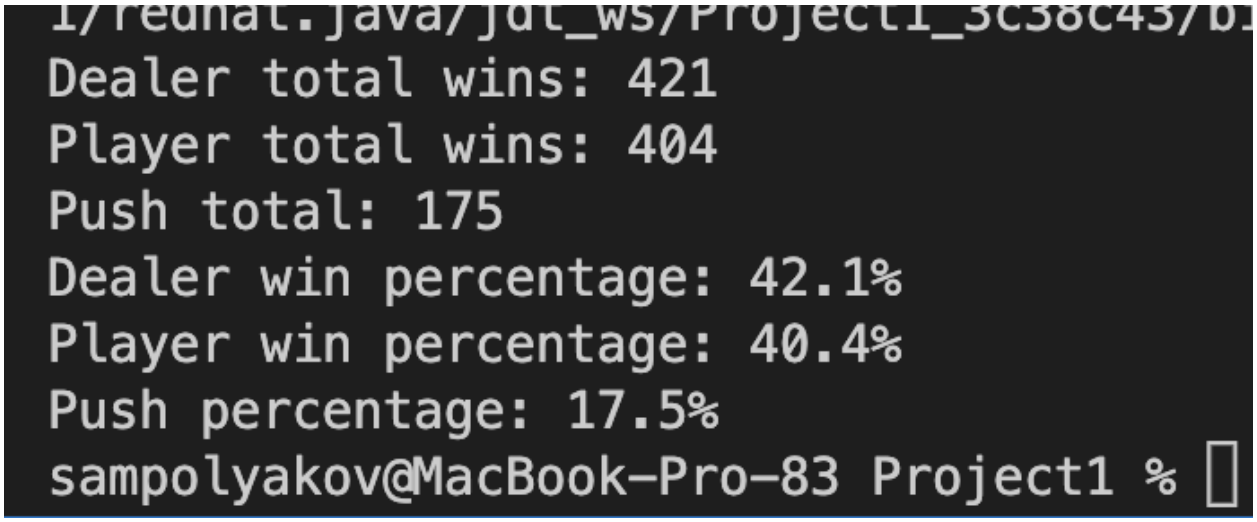
CS231 B

Blackjack Project

Abstract:
This week, we created a project that simulated blackjack games. We used java classes and objects, array lists, arrays, methods, and loops to build the card, hand, deck, blackjack, and simulation classes. In the end, the program simulated blackjack games by creating a dealer and player and dealing them both random cards until somebody won. This project was mainly about learning java so it did not introduce many new concepts but I learned a lot about how to write code in java and thought it was a great introduction to the course.

Results:
After I simulated 1000 Blackjack games, the dealer won 42.1% of them, and the player won 40.4%. This was expected because as the saying goes, the house always wins.



Extensions:
This week, I chose to make an extension in which aces could be used as either ones or elevens, depending on which was more beneficial to the player. To do this, I edited getTotalValue in the hand class to check if the card was an ace (an 11 in the program). I then said that if the total value of the hand was less than or equal to 10, it should be

played as an 11 and be played as a 1 otherwise.

```
public int getTotalValue(){
    int total = 0;
    for(int i = 0; i<this.size(); i++){
        Card c = this.getCard(i);
        if(c.getValue()==11){
            if(total<=10){
                total+=11;
            }
            else{
                total+=1;
            }
        }
        else{
            total+=c.getValue();
        }
    }
    return total;
}
```

I then created a new test in HandTests to check my work. In this test, I created 2 hands. In h1, I dealt 3 cards to the player: 5, 2, then an ace. As 5+2<10, the ace should have been used as an 11, which it was for a total of 18. For the second hand, I dealt 3 cards again: 5, 6, then 7. As 5+6>10, the Ace was used as a 1, for a total 12.

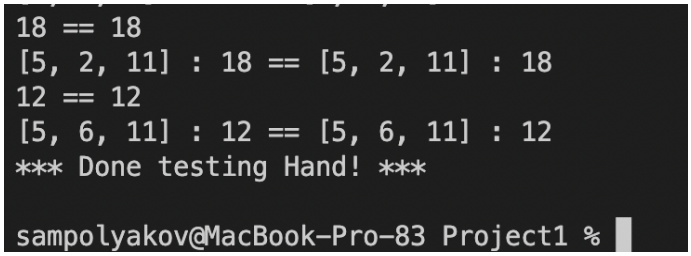
```
{
    // set up
    Hand h1 = new Hand();
    h1.add(new Card(5));
    h1.add(new Card(2));
    h1.add(new Card(11));

    Hand h2 = new Hand();
    h2.add(new Card(5));
    h2.add(new Card(6));
    h2.add(new Card(11));

    // verify
    System.out.println(h1.getTotalValue() + " == 18");
    System.out.println(h1 + " == [5, 2, 11] : 18");

    System.out.println(h2.getTotalValue() + " == 12");
    System.out.println(h2 + " == [5, 6, 11] : 12");

}
```



Sources:

For this project, I did not use any outside sources. All of my work was done from knowledge I gained from in class lectures and from the lab. I worked together with Dave Boku on some parts of the project.