Lab07 – Methods and Top-down Design

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# Part A

## Program WarGame

**File name:** WarGame.java

**Purpose:** To simulate a game of cards where the user goes against the computer.

**Packages:** java.util.Scanner

**Limitations:** The program will create an error message and prompt the user to enter again if the input is not an integer between 1 and 52 (inclusive).

**Bugs:** The compiler confuses some of the characters in the printRoundResult method.

**Input:** An integer from 1 to 52 for each round (there’s 10 rounds in total).

**Output:** Several messages displaying the relevant information about the game and the results.

**Design diagram:**

A picture containing text, screenshot, font, number

Description automatically generated

**Pseudocode:**

Algorithm WarGame

START

(**main**)

Set *ROUND* = 10

Set integer *user*

Set integer *comp*

Set integer *score* = 0

Set integer *r* = 1

While ( *r* < *ROUND* ) {

*comp* = *genInput*()

*user* = *getInput*()

*printRoundInfo*(*r*, *user*, *comp*)

*score* = *printRoundResult*(*score*, *user*, *comp*)

}

Print “End of Game!”

(**getInput**)

Set integer *user*

Set boolean *flag*

Do {

If ( *flag* ) {

Print error message

}

Print “Enter card”

Read *user*

*flag* = true

} While ( *user* < 1 || *user* > 52 )

Return *user*

(**getInput**)

Set integer *comp*

*comp* = Math.random \* 52 + 1

return *comp*

(**printRoundInfo**, parameters: *r*, *user*, *comp*)

Print “R” + *r* + “: “

Print “Computer card is “ + *getRank*(*comp*) + “ of “ *getSuit*(*comp*)

Print “; User card is “ + *getRank*(*user*) + “ of “ *getSuit*(*user*)

(**printRoundResult**, parameters: *score*, *user*, *comp*)

Set integer *winner* = *findWinner*(*user*, *comp*)

If ( *winner* = 0 ) {

*score* \*= 2

Print “It’s a tie…” + *score*

} else if ( *winner* = 1 ) {

*score* += 1

Print “User wins…” + *score*

} else {

Print “Computer wins…” + *score*

}

Return *score*

(**findWinner**, parameters: user, comp)

Set integer *userCard*

Set integer *compCard*

*userCard* = (*user* – 1) % 13 + 1

*compCard* = (*comp* - 1) % 13 + 1

If ( *userCard* = *compCard* ) {

Return 0

} else if ( *userCard* > *compCard* ) {

Return 1

} else {

Return -1

}

(**getRank**, parameter: *card*)

Set string *rank*

Set integer *num* = (*card* – 1) % 13 + 1

If ( *num* = 1 ) {

*rank* = “Ace”

} else if ( *num* = 10 ) {

*rank* = “10”

} else if ( *num* = 11 ) {

*rank* = “Jack”

} else if ( *num* = 12 ) {

*rank* = “Queen”

} else if ( *num* = 13 ) {

*rank* = “King”

} else {

*rank* = (string) *num*

}

Return *rank*

(**gerSuit**, parameter: *card*)

If ( *card* < 14 ) {

Return “Hearts”

} else if ( *card* < 27 ) {

Return “Diamonds”

} else if ( *card* < 40 ) {  
 Return “Clubs”

} else {

Return “Spades”

}

END WarGame

**Test run(s):**

A screenshot of a computer program

Description automatically generated with medium confidence

A screenshot of a computer screen

Description automatically generated with low confidence