

**Exercise 9 (10 points)** – can be done in pair or individually

- The first lines of all source files must be comments containing names & IDs of all members. Also create file `readme.txt` containing names & IDs of all members
  - Put all files (source, input, `readme.txt`) in folder `Ex9_xxx` where `xxx` = ID of the group representative. That is, your source files must be in package `Ex9_xxx` and input files must be read from this path
  - The group representative zips `Ex9_xxx` & submits it to Google Classroom. The other members submit only `readme.txt`. Email submission is not accepted
  - Use `jgrapht-core-1.5.2` but no need to include it in your submission
- =====

1. Complete class `ActorGraph`. Modify it as needed, but don't change the visibility of the given members.

```
class ActorGraph {
    public static final String BACON = "Kevin Bacon";

    private Graph<String, DefaultEdge> costarGraph;
    private Graph<String, DefaultEdge> conflictGraph;

    public void baconDegree() { /* Find Bacon degree of given actor */ }
    public void baconParties() { /* Arrange parties for Bacon */ }

    // You may use Map to keep data from input file as in Exercise 8
}
```

2. Write a main class to do the following:

2.1 Read data from `movies.txt` and build `costarGraph` + `conflictGraph` as follows

2.2 `costarGraph`

- Each node represents each actor.
- Edge between 2 nodes represents costarring (2 actors appear in the same movie)

2.3 `conflictGraph`

- Each node represents each actor.
- Edge between 2 nodes represents conflict (2 actors hate each other), supposing that everyone who works in the same movie hates each other. The only 1 exception is "Kevin Bacon" who doesn't have conflict with anyone.

So, `conflictGraph` = `costarGraph` minus "Kevin Bacon" and edges connected to him.

3. Apply graph coloring to `conflictGraph` to arrange parties for "Kevin Bacon". Actors who are invited to the same party must not have conflict with each other. Report guest list for each party.

4. Get actor name/surname from user. Apply shortest path to `costarGraph` to find Bacon degree of that actor. Report his/her acquaintance path to "Kevin Bacon".

- The program must be able to loop for new actor name/surname.

**Note** - Different coloring algorithms may give different party arrangements. You can try all of them, or choose at least 1 algorithm.

===== Bacon parties =====

By GreedyColoring >> total parties = 4

Parties 0 >> guests = 34

Al Pacino	Alec Guinness	Alison Lohman	Angelo Rossitto	Antonio Banderas	Ben Affleck
Bill Paxton	Brad Pitt	Bruce Willis	Bryce Dallas Howard	Cameron Diaz	Carrie Fisher
Carrie-Anne Moss	Clint Howard	Denise Richards	Djimon Hounsou	George Ives	Gerry Becker
Henry Fonda	Jennifer Aniston	Jim Carrey	Kathleen Byron	Kiefer Sutherland	Max von Sydow
Melissa Errico	Richard Gere	Sandra Bullock	Sean Astin	Sean Connery	Sharon Stone
Steve Altes	Steve Martin	Tea Leoni	Val Kilmer		

Parties 1 >> guests = 23

Angelina Jolie	Beau Starr	Colin Farrell	Diane Lane	Gary Sinise	Gerard Depardieu
Guy Pearce	Harrison Ford	Jennifer Connelly	John Rothman	Johnny Depp	Marilyn Monroe
Mark Hamill	Matt Damon	Oliver Platt	Patrick Stewart	Robert De Niro	Samual L. Jackson
Sigourney Weaver	Theresa Russell	Tilda Swinton	Vittorio Gassman	William Devane	

Parties 2 >> guests = 19

Anthony Hopkins	Edward Norton	Elisabeth Shue	Ethan Hawke	George Clooney	John Lafayette
John Travolta	Keanu Reeves	Larry Romano	Leonardo DiCaprio	Minnie Driver	Natalie Portman
Nicolas Cage	Peter Crombie	Robert Wagner	Sylvester Stallone	Tom Cruise	Tom Hanks
Willam Hurt					

Parties 3 >> guests = 8

Ashley Judd	Jason Lee	Joe Pantoliano	Julia Roberts	Maury Chaykin	Max Baker
Paul Giamatti	Robin Williams				

===== Bacon parties =====

By LargestDegreeFirstColoring >> total parties = 4

Parties 0 >> guests = 28

Alec Guinness	Angelina Jolie	Angelo Rossitto	Ashley Judd	Bryce Dallas Howard	Diane Lane
Elisabeth Shue	Gary Sinise	George Ives	Gerard Depardieu	Guy Pearce	Harrison Ford
Jennifer Aniston	Jennifer Connelly	Jim Carrey	John Lafayette	John Travolta	Keanu Reeves
Larry Romano	Mark Hamill	Matt Damon	Maury Chaykin	Richard Gere	Robert Wagner
Sean Astin	Sean Connery	Steve Martin	Tom Cruise		

Parties 1 >> guests = 26

Al Pacino	Alison Lohman	Antonio Banderas	Bruce Willis	Carrie Fisher	Ethan Hawke
Henry Fonda	Joe Pantoliano	John Rothman	Julia Roberts	Leonardo DiCaprio	Marilyn Monroe
Max von Sydow	Melissa Errico	Patrick Stewart	Peter Crombie	Robin Williams	Sandra Bullock
Steve Altes	Tea Leoni	Theresa Russell	Tilda Swinton	Tom Hanks	Val Kilmer
Vittorio Gassman	Willam Hurt				

Parties 2 >> guests = 22

Anthony Hopkins	Beau Starr	Ben Affleck	Bill Paxton	Brad Pitt	Carrie-Anne Moss
Clint Howard	Denise Richards	Djimon Hounsou	Gerry Becker	Jason Lee	Johnny Depp
Kiefer Sutherland	Nicolas Cage	Oliver Platt	Paul Giamatti	Robert De Niro	Samual L. Jackson
Sharon Stone	Sigourney Weaver	Sylvester Stallone	William Devane		

Parties 3 >> guests = 8

Cameron Diaz	Colin Farrell	Edward Norton	George Clooney	Kathleen Byron	Max Baker
Minnie Driver	Natalie Portman				

===== Bacon parties =====

By SmallestDegreeLastColoring >> total parties = 4

Parties 0 >> guests = 33

Alec Guinness	Alison Lohman	Antonio Banderas	Ashley Judd	Ben Affleck	Bill Paxton
Bryce Dallas Howard	Cameron Diaz	Carrie Fisher	Clint Howard	Edward Norton	George Clooney
Gerry Becker	Guy Pearce	Harrison Ford	Jim Carrey	John Rothman	John Travolta
Johnny Depp	Kathleen Byron	Keanu Reeves	Kiefer Sutherland	Leonardo DiCaprio	Marilyn Monroe
Max von Sydow	Melissa Errico	Patrick Stewart	Robert Wagner	Sean Astin	Sean Connery
Tea Leoni	Val Kilmer	William Devane			

Parties 1 >> guests = 27

Angelina Jolie	Angelo Rossitto	Brad Pitt	Bruce Willis	Djimon Hounsou	Elisabeth Shue
George Ives	Gerard Depardieu	Henry Fonda	Jennifer Aniston	Joe Pantoliano	Larry Romano
Mark Hamill	Maury Chaykin	Minnie Driver	Natalie Portman	Oliver Platt	Peter Crombie
Richard Gere	Sandra Bullock	Sharon Stone	Sigourney Weaver	Steve Martin	Sylvester Stallone
Theresa Russell	Tom Cruise	Tom Hanks			

Parties 2 >> guests = 20

Al Pacino	Anthony Hopkins	Beau Starr	Carrie-Anne Moss	Colin Farrell	Denise Richards
Diane Lane	Ethan Hawke	Gary Sinise	Jennifer Connelly	John Lafayette	Julia Roberts
Nicolas Cage	Paul Giamatti	Robin Williams	Samual L. Jackson	Steve Altes	Tilda Swinton
Vittorio Gassman	William Hurt				

Parties 3 >> guests = 4

Jason Lee	Matt Damon	Max Baker	Robert De Niro
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===== Bacon degrees =====

Enter name or surname, or 0 to quit

tom

Valid actors = [Tom Cruise, Tom Hanks]

Tom Cruise >> Bacon degree = 3

Tom Cruise - Max von Sydow	(Minority Report)
Max von Sydow - Diane Lane	(Judge Dredd)
Diane Lane - Kevin Bacon	(My Dog Skip)

Tom Hanks >> Bacon degree = 1

Tom Hanks - Kevin Bacon	(Apollo 13)
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===== Bacon degrees =====

Enter name or surname, or 0 to quit

john

Valid actors = [John Lafayette, John Rothman, John Travolta, Johnny Depp]

John Lafayette >> Bacon degree = 1

John Lafayette - Kevin Bacon	(Loverboy)
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John Rothman >> Bacon degree = 1

John Rothman - Kevin Bacon	(Picture Perfect)
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John Travolta >> Bacon degree = 3

John Travolta - Bruce Willis	(Pulp Fiction)
Bruce Willis - Robert Wagner	(The Player)
Robert Wagner - Kevin Bacon	(Wild Things)

Johnny Depp >> Bacon degree = 2

Johnny Depp - Larry Romano	(Donny Brasco)
Larry Romano - Kevin Bacon	(Sleepers)