

Part 1: Theory

1. A socket is the endpoint of a network connection. A connection attaches a socket that is bound to a specific port. A `ServerSocket` is implemented for a server, and it listens to a connection request from a client. A `Socket` is used for a client, and is the other end of the connection. It is also bounded to a particular port.

2. When the port numbers do not match, the connection will not be established, and it will throw a `ConnectException`, seen as follows:

`java.net.ConnectException: Connection refused`

Or if there is already a server that is awaiting a connection at the specified port, then it will connect to that `ServerSocket`, but incorrectly.

3. Only the `doSomething()` method is modified from the `Server.java` from class, seen as follows:

```
private void doSomething() {
    while (in.hasNextLine()) {
        String message = in.nextLine();
        System.out.println("The Client says: " + message);

        if (message.contains("ADD") ||
            message.contains("MUL")) {
            String[] split = message.split(" ");
            try {
                double x =
                    Double.parseDouble(split[1]);
                double y =
                    Double.parseDouble(split[2]);
                double result = 0;

                if (split[0].equals("ADD")) {
                    result = x + y;
                }
                if (split[0].equals("MUL")) {
                    result = x * y;
                }
                out.println("Answer: " + result);
            }
            catch (NumberFormatException e) {
                out.println("Error. Wrong format.");
            }
        }
    }
}
```

Part 2: Programming

1. Argentina, Chile, Colombia, Ecuador, Peru
2. United Kingdom
3. Angola Australia Botswana Burundi Christmas Island Cocos (Keeling) Islands Comoros Congo, Democratic Republic of the Congo, Republic of the Fiji Indonesia Kenya Kiribati Lesotho Madagascar Malawi Mauritius Mozambique Namibia New Caledonia New Zealand Norfolk Island Papua New Guinea Rwanda Seychelles Solomon Islands South Africa Swaziland Tanzania Timor-Leste Tuvalu Vanuatu Zambia Zimbabwe
4. Hong Kong, India, Kazakhstan, Malaysia, Maldives, Nepal, Pakistan, Thailand
5. Iceland : 50684 kWh
Norway : 23461 kWh
Kuwait : 16105 kWh
Finland : 14747 kWh
Canada : 14603 kWh
Sweden : 13937 kWh
United Arab Emirates : 13540 kWh
Qatar : 12915 kWh
United States : 12280 kWh
Luxembourg : 11601 kWh
6. **More than 80%:**
Algeria: Sunni Muslim (state religion) 99%
Anguilla: Protestant 83.1% (Anglican 29%)
Argentina: nominally Roman Catholic 92% (less than 20% practicing)
Armenia: Armenian Apostolic 94.7%
Aruba: Roman Catholic 80.8%
Azerbaijan: Muslim 93.4%
Bahrain: Muslim (Shia and Sunni) 81.2%
Bangladesh: Muslim 89.5%
Bolivia: Roman Catholic 95%
British Virgin Islands: Protestant 84%
Burma: Buddhist 89%
Cambodia: Buddhist (official) 96.4%
Colombia: Roman Catholic 90%

Comoros: Sunni Muslim 98%
Croatia: Roman Catholic 87.8%
Cuba: nominally Roman Catholic 85%
Curacao: Roman Catholic 80.1%
Denmark: Evangelical Lutheran (official) 95%
Djibouti: Muslim 94%
Dominican Republic: Roman Catholic 95%
Ecuador: Roman Catholic 95%
Egypt: Muslim (mostly Sunni) 90%
Faroe Islands: Evangelical Lutheran 83.8%
Finland: Lutheran Church of Finland 82.5%
France: Roman Catholic 83%-88%
Gambia, The: Muslim 90%
Gaza Strip: Muslim (predominantly Sunni) 99.3%
Georgia: Orthodox Christian (official) 83.9%
Greece: Greek Orthodox (official) 98%
Guam: Roman Catholic 85%
Guinea: Muslim 85%
Honduras: Roman Catholic 97%
Hong Kong: eclectic mixture of local religions 90%
Iceland: Lutheran Church of Iceland (official) 80.7%
India: Hindu 80.5%
Indonesia: Muslim 86.1%
Iran: Muslim (official) 98%
Iraq: Muslim (official) 97%
Ireland: Roman Catholic 87.4%
Japan: Shintoism 83.9%
Jordan: Sunni Muslim 92% (official)
Kuwait: Muslim (official) 85%
Liberia: Christian 85.6%
Libya: Sunni Muslim (official) 97%
Luxembourg: Roman Catholic 87%
Malawi: Christian 82.7%
Mali: Muslim 94.8%
Malta: Roman Catholic (official) 98%

Mauritania: Muslim (official) 100%

Mexico: Roman Catholic 82.7%

Moldova: Eastern Orthodox 98%

Monaco: Roman Catholic 90% (official)

Morocco: Muslim 99% (official)

Namibia: Christian 80% to 90% (at least 50

Nepal: Hindu 80.6%

Pakistan: Muslim (official) 96.4% (Sunni 85-90%)

Panama: Roman Catholic 85%

Paraguay: Roman Catholic 89.6%

Peru: Roman Catholic 81.3%

Poland: Roman Catholic 89.8% [about 75% practicing]

Portugal: Roman Catholic 84.5%

Puerto Rico: Roman Catholic 85

Saint Pierre and Miquelon: Roman Catholic 99%

Saint Vincent and the Grenadines: Protestant 75% (Anglican 47%)

Saudi Arabia: Muslim (official) 100%

Senegal: Muslim 94%

Serbia: Serbian Orthodox 85%

Seychelles: Roman Catholic 82.3%

Spain: Roman Catholic 94

Sweden: Lutheran 87%

Taiwan: mixture of Buddhist and Taoist 93%

Tajikistan: Sunni Muslim 85%

Thailand: Buddhist (official) 94.6%

Timor-Leste: Roman Catholic 98%

Turkey: Muslim 99.8% (mostly Sunni)

Turkmenistan: Muslim 89%

Tuvalu: Protestant 98.4% (Church of Tuvalu (Congregationalist) 97%

Uzbekistan: Muslim 88% (mostly Sunni)

Venezuela: nominally Roman Catholic 96%

Virgin Islands: Protestant 59%

Wallis and Futuna: Roman Catholic 99%

Less than 50%:

Angola: indigenous beliefs 47
Belize: Roman Catholic 39.3
Benin: Catholic 27.1
Bosnia and Herzegovina: Muslim 40
Cameroon: indigenous beliefs 40
Canada: Roman Catholic 42.6
Central African Republic: indigenous beliefs 35
Christmas Island: Buddhist 36
Cote d'Ivoire: Muslim 38.6
Czech Republic: Roman Catholic 10.3
Estonia: Evangelical Lutheran 13.6
Ethiopia: Ethiopian Orthodox 43.5
Germany: Protestant 34
Jamaica: Protestant 62.5
Korea, South: Christian 31.6
Latvia: Lutheran 19.6
Mauritius: Hindu 48
Mozambique: Catholic 28.4
Netherlands: Roman Catholic 30
Palau: Roman Catholic 41.6
Papua New Guinea: Roman Catholic 27
Russia: Russian Orthodox 15-20
Singapore: Buddhist 42.5
Sint Maarten: Roman Catholic 39
Suriname: Hindu 27.4
Swaziland: Zionist 40
Switzerland: Roman Catholic 41.8
Togo: Christian 29
Tonga: Christian (Free Wesleyan Church claims over 30
Trinidad and Tobago: Roman Catholic 26
Uganda: Roman Catholic 41.9
Uruguay: Roman Catholic 47.1
Vietnam: Buddhist 9.3

7. Holy See (Vatican City), Lesotho, San Marino
8. Top 10 countries with the highest military expenditure per capita:
 - Qatar : \$9351
 - Oman : \$3308
 - United Arab Emirates : \$3224
 - Saudi Arabia : \$3113
 - Israel : \$2427
 - United States : \$2315
 - Singapore : \$2188
 - Kuwait : \$2105
 - Australia : \$1329
 - Brunei : \$1272

Extra Credit:

1. Top 10 countries with highest ratio of population to number of airports:
Bangladesh, Hong Kong, India, Nigeria, China, Ghana, Vietnam, Gambia
Rwanda, Ethiopia
2. If (0,0) is defined as the coordinate 90 N, 180 W, then the box is between
the coordinates (114, 70) (124, 80)
Countries within this box:
Anguilla, Antigua and Barbuda, Barbados, British Virgin Islands, Dominica, Grenada, Montserrat, Puerto Rico, Saint Barthelemy, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sint Maarten, Trinidad and Tobago, Venezuela, Virgin Islands