The Tube has been an integral part of London's history since 1863 and carry's 1.34 billion passengers a year. There are 270 stations on the 11 line network, with Waterloo being the busiest station carrying 95.1 million passengers per year.

The following tabular data shows the number of passengers who entered 20 stations on a typical day on the network in 2017. The table shows passenger numbers for January – June (inclusive) and July – December (inclusive).

| Station | Jan - June | | | July - December | | |
|---|---|---|---|---|---|---|
| | Entry Weekday | Entry Saturday | Entry Sunday | Entry Weekday | Entry Saturday | Entry Sunday |
| Acton Town | 82736 | 68110 | 8019 | 74774 | 52945 | 5596 |
| Angel | 121455 | 37385 | 7474 | 69899 | 37517 | 6683 |
| Arsenal | 80209 | 69773 | 7108 | 76230 | 47597 | 8740 |
| Baker Street | 125723 | 67265 | 10404 | 117833 | 58554 | 10475 |
| Camden Town | 92182 | 78472 | 9241 | 61522 | 76710 | 6911 |
| Charing Cross | 134345 | 35697 | 9497 | 64657 | 33618 | 12420 |
| Ealing Broadway | 133013 | 43263 | 7949 | 77662 | 55706 | 13973 |
| Earls Court | 58076 | 37154 | 11020 | 116105 | 62048 | 9657 |
| Elephant & Castle | 56662 | 53679 | 5717 | 110983 | 31833 | 10021 |
| Kilburn | 54552 | 69391 | 7614 | 71962 | 45061 | 5608 |
| Leicester Square | 111888 | 54189 | 13312 | 84493 | 70134 | 9157 |
| Liverpool Street | 58770 | 31594 | 6690 | 125882 | 37793 | 9140 |
| Oxford Circus | 72090 | 74734 | 12621 | 136375 | 67009 | 10190 |
| Paddington | 54260 | 70581 | 11520 | 98079 | 51179 | 7388 |
| Piccadilly Circus | 86151 | 35927 | 7864 | 137898 | 53781 | 9235 |
| Tooting | 90115 | 50790 | 14238 | 126777 | 39705 | 6201 |
| Vauxhall | 80197 | 78242 | 8314 | 58952 | 73632 | 11765 |
| Victoria | 86331 | 46553 | 7957 | 76201 | 71271 | 10431 |
| Wembley Park | 105979 | 44171 | 8576 | 88696 | 64923 | 6355 |
| Wimbledon | 99391 | 52058 | 11319 | 123703 | 72293 | 11730 |

The table show entries for each of the 20 stations on a weekday, as well as Saturdays and Sundays.

You must write a Java application to do the following:

1. Represent the passenger information using a suitable data structure(s). You can generate random values for the number of entries for each station. The values you generate must be in the following ranges:
    - A weekday (in the range 50000 to 140000)
    - A Saturday (in the range 30000 to 80000)
    - A Sunday (in the range 5000 to 15000)
2. Display the passenger information neatly (see the output from my solution below).
3. Calculate and display which station was the busiest across the entire year (displaying the station name and the total number of passengers).
4. Calculate and display the percentage increase/decrease of passenger entries for each station. This percentage value must be based on the difference in passenger entries between both halves of the year. This value must be formatted to a maximum of two decimal places.

*A sample run of my solution yielded the following output.*

```
run:
                          Jan-Jun                              Jul-Dec
                 Weekday   Saturday  Sunday    |    Weekday   Saturday  Sunday
Acton Town       122912    31608     7093      |    122382    78798     5514
Angel            129865    49240     7131      |    123321    55982     14660
Arsenal          69371     66153     12893     |    94443     58213     11419
Baker Street     127185    34640     8969      |    103427    43440     6659
Camden Town      74735     37552     5783      |    52142     46382     14360
Charing Cross    90955     36397     13452     |    84633     76186     8349
Ealing Broadway  136028    32708     10994     |    125885    43979     13328
Earls Court      55386     61649     14892     |    79185     49518     10346
Elephant & Castle 127374   42806     13916     |    116476    43766     10238
Kilburn          89813     49311     9833      |    80573     30759     14319
Leicester Square 53624     73773     5948      |    121707    32083     14337
Liverpool Street 102533    57988     12247     |    66048     50895     6181
Oxford Circus    116991    70507     12212     |    53425     46196     13457
Paddington       136845    40304     7908      |    95447     56050     9931
Piccadilly Circus 77178    78238     8209      |    136931    56988     13407
Tooting          97431     71924     5240      |    53975     72395     14742
Vauxhall         126262    70637     6343      |    104631    30618     12445
Victoria         86994     68129     14063     |    133364    67351     5508
Wembley Park     57824     77658     11310     |    75010     31966     5133
Wimbledon        112471    67171     7015      |    58457     66615     11561
The busiest station is Angel with 380199 passengers

Percentage increase/decrease
Acton Town: 27.89%
Angel: 4.15%
Arsenal: 10.55%
Baker Street: -10.11%
Camden Town: -4.39%
Charing Cross: 20.14%
Ealing Broadway: 1.93%
Earls Court: 5.4%
Elephant & Castle: -7.4%
Kilburn: -15.65%
Leicester Square: 26.08%
Liverpool Street: -28.73%
Oxford Circus: -43.38%
Paddington: -12.77%
Piccadilly Circus: 26.71%
Tooting: -19.18%
Vauxhall: -27.33%
Victoria: 21.89%
Wembley Park: -23.63%
Wimbledon: -26.8%
BUILD SUCCESSFUL (total time: 1 second)
```

| Marks Allocation | |
|---|---|
| Represent Data | **15** |
| Display passenger information neatly | **30** |
| Calculate and display the busiest station | **20** |
| Calculate and display the % incr\decr for each station | **35** |
| **TOTAL** | **100%** |

You must have at least four methods (along with main) in your solution.

- Method one – to initialise the passenger information.
- Method two – to display the passenger information.
- Method three – to determine the busiest station.
- Method four – to calculate the percentage increase\decrease for each station.

**Calculating a percentage increase/decrease.**

**Consider this example:**

A college student has **21** timetabled hours in **1st** year.

Another college student has **24** timetabled hours in **2nd** year.

Calculate the percentage increase/decrease in hours from **1st** to **2nd** year.

**Firstly,** you must calculate the difference between the **2nd** year hours and the **1st** year hours.

**24 – 21 = 3.**

There has been an increase of **3** hours. If the calculation resulted in a negative number there would (obviously) have been a decrease.

**Secondly,** you need to work out the increase/decrease as a percentage of the **1st** year hours. Therefore, you must divide the increase/decrease by the **1st** year hours.

**3 / 21 = .14**

**Thirdly**, multiply the answer by 100.

**.14 * 100 = 14.29**

We can now say that there has been a **14.29%** increase in the number of timetabled hours in college that the student has.