Homework 1

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Calculate the following:

- 543 + 87655
- (3215 + 23) / 42
- 3 ^ 5
- 45 %% 7
- body_mass_index <- weight_in_kgs/(height_in_meters ^ 2) when weight is 75 kilograms and height is 1.70 meters

---

Find u

given,

```
p <- 145
q <- 212
r <- 56
```

and

```
u <- c(p, q, r)
```

Also calculate

```
u <- c(u, u, u, u)

sum(u)

mean(u)

min(u)

max(u)

sd(u)
```

---

find class and typeof for the following variables:

```
numeric_var <- 78

character_var <- "Bloomberg Research Center"

logical_var <- TRUE

evenNumbers <- c(2, 4, 6, 8, 10, 12, 14, 16, 20)

zero <- 0

pi <- 3.141593

powersOfTen <- c(1, 10, 100, 1000, 10000, 100000)
```

---

vectors

Consider the following vectors:

```
a <- 17
b <- 6
```

Use the elementary arithmetic operators +, -, *, /, and ^ to:

- a) add a and b
- b) subtract b from a
- c) multiply a by b
- d) divide a by b
- e) raise a to the power of b

Consider the following vectors:

```
a <- c(1, 3, 5, 7, 9)
b <- c(2, 4, 6, 8, 10)
```

Find the following:

- a) add a and b
- b) subtract b from a
- c) multiply a by b
- d) divide a by b
- e) raise a to the power of b
- f) (13 * a + b) / 10
- g) (a + 0.15 * b) ^ 2
- h) (a + 21) * (a - 9) + b

Mortgage payment

Consider the following formula to calculate the number of mortgage payment terms:

$$n = \frac{\ln\left(\frac{i}{\frac{M}{P} - i} + 1\right)}{\ln(1+i)}$$

In this equation, `M` represents the monthly payment amount, `P` the principle, and `i` the (monthly) interest rate.

Figure 1: Formula for calculation number of periods - n

- Calculate the number of payment terms n for a mortgage with a principle balance P of \$380,000, monthly interest rate i of 0.045%, and monthly payment amount M of 1850.
- What if all else is the same (no change in other variables) but monthly payments M is now given as a vector

```
c(1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000)
```

?
