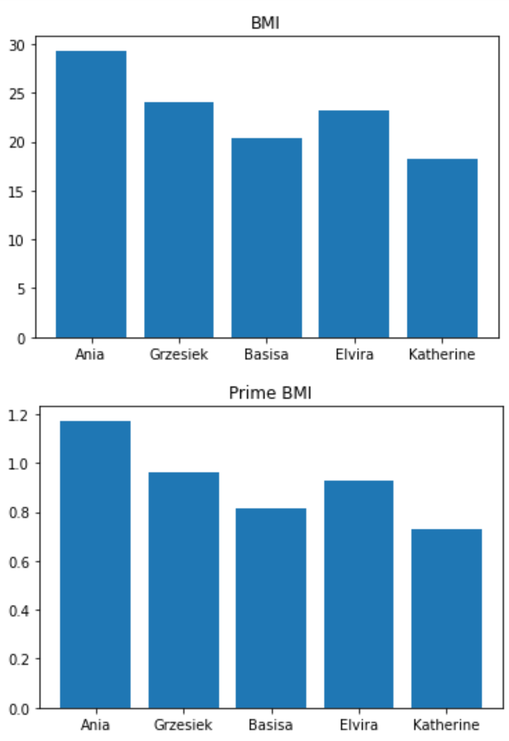
SIT220/731 2022.T1: Task 1P

[redacted]

Undergradute (SIT220)

In [89]:
```
import numpy as np
import matplotlib.pyplot as plt

names = ["Ania", "Grzesiek", "Basisa", "Elvira", "Katherine"]
heights = [161, 180, 173, 158, 177]
weights = [76, 78, 61, 58, 57]

#check if data is correct
def checkData():
    for i in heights:
        if i < 1 or i > 200:
            raise Exception("incorrect data")
    for j in weights:
        if j < 1 or j > 1000:
            raise Exception("incorrect data")
            break;

checkData()

#store bmi
bmi_list = []
primeBMI_list = []

#calc bmi and add to bmi list
def createBMI_list(heights, weights):
    for H, W in zip(heights, weights):
        bmi = W / (H/100)**2
        bmi_list.append(bmi)

createBMI_list(heights, weights)
rounded_bmi = [round(bmi, 2) for bmi in bmi_list]

#return prime BMI
def primeBMI(BMI):
    BMI = BMI/25
    return round(BMI,2)

#calc primt BMI and add to prime BMI list
def createprimeBMI_list(BMI):
    for i in BMI:
        primeBMI = i/25
        primeBMI_list.append(primeBMI)

createprimeBMI_list(bmi_list)

#prints bar chart of bmi
plt.bar(names, bmi_list)
plt.title("BMI")
plt.show()

#prints bar chart of prime bmi
plt.bar(names, primeBMI_list)
plt.title("Prime BMI")
plt.show()

#get bmi category when called
def get_bmi_category(x):
    if x <= 18.4:
        return "underweight"
    elif x >= 18.5 and x <= 24.9:
        return "normal"
    elif x >= 25 and x <= 29.9:
        return "overweight"
    else:
        return "obese"

#prints names, bmi and prime bmi of user
def bmiResult(nameS, roundedBMI):
    for names, i in zip(nameS, roundedBMI):
        print(names, "has a BMI of", i, " which is ", get_bmi_category(i), ". The BMI prime index is ", primeBMI(i),".\n")

bmiResult(names, rounded_bmi)
```




```
Ania has a BMI of 29.32  which is  overweight . The BMI prime index is  1.17 .

Grzesiek has a BMI of 24.07  which is  normal . The BMI prime index is  0.96 .

Basisa has a BMI of 20.38  which is  normal . The BMI prime index is  0.82 .

Elvira has a BMI of 23.23  which is  normal . The BMI prime index is  0.93 .

Katherine has a BMI of 18.19  which is  underweight . The BMI prime index is  0.73 .
```

Benefits And Limitiations Of BMI

The main advantage of BMI is that unlike other methods, it doesn't require speical training for testing since its a general measurement of obesity in a population. Because its a measurement that can be used for on most people, it allows doctors or GPs to determine potential health risk. For example, a person who is overweight may have diabetes or high blood pressure.

Although, using BMI is a simple way to determine if a person is underweight, normal weight, overweight, or obese, it has its limitation, especially when it is applied to abdominal obesity, short stature, etc. One example would be scaling, as mass increases to the third power of linear dimensions, taller people with the same body shape tend to have bigger BMI even though they are considered healthy. Muscle mass could play a contribution on giving a taller person larger BMI. So, if peoples' bodies demensions double, and their mass scales naturally, the BMI would double instead staying the same. As a result, giving unrealitic BMI levels compared to their body fat levels.

An alternative to BMI, is having finding the person's BMI prime. BMI prime is a ratio of a person's BMI to the upper limit optimal BMI. It determines how far an individual differs upper weight limit and also can be compared between people who have different upper BMI weight limits. Typically in Southeast Asia, their upper weight limits are 23 instead of 25, which is the upper weight limits for the rest of the world.