**Типовой расчет**

**Студенты, имеющие варианты с 1 по 10, выполняют задание № 1, имеющие варианты с 11 по 20 – задание № 2.**

*Задание №1*

Отдел маркетинга крупной швейной фабрики провёл анкетирование 500 человек (женщин) по вопросу роста (Х) см и веса (Y) кг. В результате была выявлена следующая зависимость (таблица 12).

**Требуется:**

1. произвести выборку из 200 значений;
2. построить эмпирическую функцию распределения, полигон, гистограмму для случайной величины *Х*;
3. построить точечные и интервальные оценки для мат. ожидания и дисперсии генеральной совокупности *Х*;
4. сделать статистическую проверку гипотезы о законе распределения случайной величины *Х;*

часть 2.

5) нанести на координатную плоскость данные выборки (*x;y*) и по виду корреляционного облака подобрать вид функции регрессии;

6) составить корреляционную таблицу по сгруппированным данным;

7) вычислить коэффициент корреляции;

1. получить уравнение регрессии.

Таблица 12 Зависимость роста и веса

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* |
| X | 168 | 169 | 156 | 171 | 175 | 159 | 167 | 169 | 170 | 156 | 168 | 169 |
| Y | 73 | 68 | 56 | 75 | 66 | 60 | 60 | 68 | 68 | 54 | 62 | 56 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *13* | *14* | *15* | *16* | *17* | *18* | *19* | *20* | *21* | *22* | *23* | *24* | *25* |
| X | 164 | 171 | 174 | 176 | 170 | 173 | 171 | 196 | 155 | 174 | 176 | 176 | 172 |
| Y | 66 | 66 | 64 | 81 | 61 | 69 | 62 | 60 | 61 | 66 | 75 | 60 | 70 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *26* | *27* | *28* | *29* | *30* | *31* | *32* | *33* | *34* | *35* | *36* | *37* | *38* |
| X | 172 | 163 | 187 | 172 | 161 | 176 | 164 | 166 | 168 | 162 | 163 | 172 | 175 |
| Y | 67 | 59 | 84 | 70 | 60 | 70 | 60 | 63 | 55 | 55 | 65 | 65 | 64 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *39* | *40* | *41* | *42* | *43* | *44* | *45* | *46* | *47* | *48* | *49* | *50* | *51* |
| X | 156 | 164 | 167 | 177 | 183 | 163 | 172 | 172 | 172 | 173 | 163 | 166 | 178 |
| Y | 54 | 70 | 63 | 67 | 73 | 63 | 69 | 60 | 63 | 67 | 66 | 57 | 69 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *52* | *53* | *54* | *55* | *56* | *57* | *58* | *59* | *60* | *61* | *62* | *63* | *64* |
| X | 169 | 171 | 165 | 175 | 171 | 186 | 165 | 164 | 163 | 173 | 173 | 177 | 173 |
| Y | 75 | 60 | 63 | 80 | 67 | 71 | 64 | 60 | 67 | 69 | 66 | 72 | 75 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *65* | *66* | *67* | *68* | *69* | *70* | *71* | *72* | *73* | *74* | *75* | *76* | *77* |
| X | 156 | 172 | 160 | 176 | 171 | 169 | 163 | 163 | 172 | 178 | 166 | 164 | 171 |
| Y | 53 | 59 | 62 | 71 | 66 | 75 | 63 | 72 | 74 | 73 | 57 | 59 | 69 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *78* | *79* | *80* | *81* | *82* | *83* | *84* | *85* | *86* | *87* | *88* | *89* | *90* |
| X | 163 | 163 | 182 | 163 | 169 | 164 | 164 | 170 | 176 | 163 | 179 | 176 | 182 |
| Y | 63 | 58 | 76 | 58 | 67 | 70 | 62 | 67 | 65 | 57 | 80 | 67 | 66 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *91* | *92* | *93* | *94* | *95* | *96* | *97* | *98* | *99* | *100* | *101* | *102* | *103* |
| X | 169 | 159 | 169 | 165 | 165 | 167 | 173 | 170 | 170 | 169 | 164 | 177 | 173 |
| Y | 73 | 68 | 62 | 61 | 62 | 64 | 69 | 61 | 61 | 68 | 59 | 68 | 64 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *104* | *105* | *106* | *107* | *108* | *109* | *110* | *111* | *112* | *113* | *114* | *115* | *116* |
| X | 166 | 161 | 162 | 190 | 167 | 160 | 165 | 156 | 157 | 174 | 168 | 176 | 170 |
| Y | 63 | 66 | 66 | 80 | 59 | 62 | 76 | 59 | 60 | 69 | 58 | 72 | 65 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *117* | *118* | *119* | *120* | *121* | *122* | *123* | *124* | *125* | *126* | *127* | *128* | *129* |
| X | 173 | 168 | 164 | 164 | 172 | 173 | 173 | 165 | 167 | 173 | 184 | 163 | 179 |
| Y | 69 | 61 | 57 | 56 | 63 | 64 | 78 | 60 | 59 | 72 | 68 | 58 | 69 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *130* | *131* | *132* | *133* | *134* | *135* | *136* | *137* | *138* | *139* | *140* | *141* | *142* |
| X | 161 | 162 | 158 | 171 | 177 | 164 | 166 | 171 | 174 | 170 | 174 | 169 | 174 |
| Y | 66 | 55 | 57 | 57 | 60 | 53 | 62 | 62 | 73 | 61 | 73 | 62 | 70 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *143* | *144* | *145* | *146* | *147* | *148* | *149* | *150* | *151* | *152* | *153* | *154* | *155* |
| X | 169 | 175 | 167 | 172 | 168 | 163 | 168 | 161 | 173 | 164 | 167 | 164 | 173 |
| Y | 71 | 67 | 63 | 64 | 63 | 65 | 67 | 56 | 66 | 62 | 68 | 63 | 70 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *156* | *157* | *158* | *159* | *160* | *161* | *162* | *163* | *164* | *165* | *166* | *167* | *168* |
| X | 176 | 172 | 167 | 173 | 161 | 171 | 169 | 161 | 170 | 174 | 168 | 164 | 170 |
| Y | 65 | 67 | 70 | 77 | 51 | 76 | 62 | 52 | 61 | 68 | 63 | 64 | 66 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *169* | *170* | *171* | *172* | *173* | *174* | *175* | *176* | *177* | *178* | *179* | *180* | *181* |
| X | 164 | 162 | 166 | 172 | 169 | 169 | 163 | 178 | 166 | 168 | 168 | 180 | 163 |
| Y | 60 | 60 | 62 | 67 | 64 | 57 | 65 | 80 | 55 | 59 | 64 | 69 | 60 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *182* | *183* | *184* | *185* | *186* | *187* | *188* | *189* | *190* | *191* | *192* | *193* | *194* |
| X | 165 | 163 | 158 | 171 | 175 | 170 | 165 | 184 | 169 | 167 | 167 | 179 | 165 |
| Y | 62 | 64 | 61 | 69 | 74 | 69 | 69 | 72 | 67 | 61 | 65 | 69 | 59 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *195* | *196* | *197* | *198* | *199* | *200* | *201* | *202* | *203* | *204* | *205* | *206* | *207* |
| X | 173 | 161 | 166 | 164 | 159 | 175 | 169 | 172 | 172 | 167 | 160 | 156 | 161 |
| Y | 69 | 60 | 67 | 59 | 55 | 67 | 68 | 73 | 64 | 64 | 59 | 52 | 61 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *208* | *209* | *210* | *211* | *212* | *213* | *214* | *215* | *216* | *217* | *218* | *219* | *220* |
| X | 174 | 167 | 174 | 167 | 168 | 168 | 167 | 167 | 171 | 168 | 162 | 174 | 173 |
| Y | 79 | 61 | 66 | 56 | 50 | 58 | 59 | 68 | 72 | 66 | 64 | 67 | 68 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *221* | *222* | *223* | *224* | *225* | *226* | *227* | *228* | *229* | *230* | *231* | *232* | *233* |
| X | 173 | 165 | 167 | 172 | 176 | 174 | 171 | 169 | 161 | 173 | 170 | 176 | 171 |
| Y | 71 | 68 | 62 | 66 | 72 | 74 | 70 | 62 | 56 | 69 | 74 | 70 | 65 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *234* | *235* | *236* | *237* | *238* | *239* | *240* | *241* | *242* | *243* | *244* | *245* | *246* |
| X | 166 | 167 | 156 | 167 | 166 | 167 | 173 | 169 | 176 | 168 | 163 | 169 | 164 |
| Y | 51 | 66 | 58 | 55 | 62 | 60 | 63 | 74 | 62 | 65 | 68 | 55 | 61 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *247* | *248* | *249* | *250* | *251* | *252* | *253* | *254* | *255* | *256* | *257* | *258* | *259* |
| X | 164 | 170 | 172 | 166 | 163 | 164 | 166 | 175 | 162 | 164 | 164 | 164 | 167 |
| Y | 60 | 63 | 72 | 57 | 65 | 56 | 62 | 64 | 60 | 61 | 65 | 66 | 64 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *260* | *261* | *262* | *263* | *264* | *265* | *266* | *267* | *268* | *269* | *270* | *271* | *272* |
| X | 170 | 161 | 174 | 165 | 171 | 166 | 172 | 170 | 180 | 164 | 184 | 168 | 172 |
| Y | 58 | 57 | 74 | 69 | 60 | 67 | 64 | 61 | 73 | 61 | 84 | 68 | 68 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *273* | *274* | *275* | *276* | *277* | *278* | *279* | *280* | *281* | *282* | *283* | *284* | *285* |
| X | 165 | 176 | 171 | 169 | 171 | 170 | 164 | 167 | 164 | 165 | 162 | 164 | 178 |
| Y | 63 | 70 | 67 | 70 | 63 | 60 | 57 | 65 | 62 | 60 | 53 | 61 | 80 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *286* | *287* | *288* | *289* | *290* | *291* | *292* | *293* | *294* | *295* | *296* | *297* | *298* |
| X | 159 | 171 | 169 | 169 | 178 | 180 | 167 | 164 | 170 | 165 | 181 | 170 | 173 |
| Y | 55 | 65 | 63 | 70 | 75 | 65 | 57 | 60 | 61 | 60 | 68 | 75 | 66 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *299* | *300* | *301* | *302* | *303* | *304* | *305* | *306* | *307* | *308* | *309* | *310* | *311* |
| X | 182 | 166 | 163 | 165 | 180 | 162 | 171 | 171 | 161 | 167 | 167 | 169 | 178 |
| Y | 75 | 67 | 58 | 57 | 75 | 54 | 73 | 72 | 59 | 59 | 61 | 64 | 72 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *312* | *313* | *314* | *315* | *316* | *317* | *318* | *319* | *320* | *321* | *322* | *323* | *324* |
| X | 164 | 171 | 168 | 177 | 161 | 172 | 154 | 170 | 167 | 162 | 168 | 168 | 173 |
| Y | 65 | 70 | 54 | 78 | 55 | 73 | 52 | 65 | 55 | 52 | 64 | 62 | 63 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *325* | *326* | *327* | *328* | *329* | *330* | *331* | *332* | *333* | *334* | *335* | *336* | *337* |
| X | 162 | 165 | 171 | 161 | 159 | 163 | 163 | 170 | 173 | 173 | 170 | 168 | 169 |
| Y | 65 | 57 | 64 | 62 | 54 | 63 | 61 | 76 | 65 | 69 | 66 | 67 | 64 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *338* | *339* | *340* | *341* | *342* | *343* | *344* | *345* | *346* | *347* | *348* | *349* | *350* |
| X | 175 | 161 | 171 | 171 | 169 | 170 | 171 | 166 | 171 | 169 | 177 | 158 | 167 |
| Y | 59 | 52 | 64 | 66 | 66 | 70 | 63 | 78 | 67 | 69 | 70 | 56 | 71 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *351* | *352* | *353* | *354* | *355* | *356* | *357* | *358* | *359* | *360* | *361* | *362* | *363* |
| X | 166 | 176 | 163 | 161 | 168 | 172 | 156 | 166 | 165 | 165 | 166 | 167 | 167 |
| Y | 63 | 65 | 63 | 51 | 60 | 78 | 54 | 61 | 72 | 56 | 55 | 63 | 63 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *364* | *365* | *366* | *367* | *368* | *369* | *370* | *371* | *372* | *373* | *374* | *375* | *376* |
| X | 171 | 165 | 160 | 157 | 165 | 166 | 157 | 165 | 165 | 160 | 166 | 168 | 186 |
| Y | 60 | 61 | 50 | 53 | 66 | 60 | 56 | 59 | 63 | 61 | 62 | 70 | 72 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *377* | *378* | *379* | *380* | *381* | *382* | *383* | *384* | *385* | *386* | *387* | *388* | *389* |
| X | 171 | 170 | 170 | 167 | 169 | 168 | 162 | 178 | 176 | 161 | 171 | 159 | 168 |
| Y | 65 | 73 | 65 | 65 | 61 | 64 | 56 | 66 | 78 | 56 | 70 | 57 | 70 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *390* | *391* | *392* | *393* | *394* | *395* | *396* | *397* | *398* | *399* | *400* | *401* | *402* |
| X | 167 | 178 | 169 | 163 | 169 | 170 | 187 | 174 | 162 | 165 | 164 | 173 | 162 |
| Y | 67 | 62 | 62 | 68 | 66 | 68 | 63 | 66 | 57 | 63 | 60 | 77 | 58 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *403* | *404* | *405* | *406* | *407* | *408* | *409* | *410* | *411* | *412* | *413* | *414* | *415* |
| X | 179 | 162 | 166 | 176 | 175 | 155 | 161 | 188 | 165 | 165 | 164 | 171 | 169 |
| Y | 63 | 65 | 63 | 70 | 77 | 51 | 64 | 75 | 61 | 67 | 59 | 64 | 59 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *416* | *417* | *418* | *419* | *420* | *421* | *422* | *423* | *424* | *425* | *426* | *427* | *428* |
| X | 171 | 163 | 171 | 172 | 165 | 170 | 173 | 169 | 169 | 167 | 162 | 170 | 175 |
| Y | 62 | 64 | 65 | 67 | 60 | 63 | 66 | 67 | 58 | 64 | 58 | 63 | 75 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *429* | *430* | *431* | *432* | *433* | *434* | *435* | *436* | *437* | *438* | *439* | *440* | *441* |
| X | 175 | 170 | 168 | 185 | 166 | 161 | 176 | 179 | 167 | 163 | 167 | 179 | 180 |
| Y | 69 | 65 | 55 | 82 | 58 | 63 | 67 | 71 | 63 | 54 | 57 | 78 | 76 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *442* | *443* | *444* | *445* | *446* | *447* | *448* | *449* | *450* | *451* | *452* | *453* | *454* |
| X | 166 | 171 | 163 | 180 | 179 | 176 | 164 | 168 | 174 | 170 | 162 | 157 | 157 |
| Y | 57 | 59 | 60 | 84 | 77 | 77 | 60 | 63 | 75 | 65 | 61 | 60 | 59 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *455* | *456* | *457* | *458* | *459* | *460* | *461* | *462* | *463* | *464* | *465* | *466* | *467* |
| X | 177 | 161 | 148 | 168 | 176 | 166 | 169 | 168 | 176 | 167 | 159 | 164 | 181 |
| Y | 72 | 55 | 48 | 66 | 70 | 71 | 62 | 67 | 70 | 75 | 48 | 53 | 77 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *468* | *469* | *470* | *471* | *472* | *473* | *474* | *475* | *476* | *477* | *478* | *479* | *480* |
| X | 165 | 171 | 159 | 174 | 160 | 169 | 167 | 170 | 161 | 174 | 178 | 168 | 168 |
| Y | 61 | 66 | 61 | 70 | 57 | 65 | 63 | 65 | 58 | 74 | 71 | 71 | 67 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | *481* | *482* | *483* | *484* | *485* | *486* | *487* | *488* | *489* | *490* | *491* | *492* | *493* |
| X | 165 | 173 | 166 | 175 | 158 | 174 | 178 | 170 | 167 | 168 | 161 | 161 | 166 |
| Y | 55 | 65 | 55 | 78 | 57 | 65 | 60 | 62 | 61 | 70 | 66 | 60 | 64 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| N | *494* | *495* | *496* | *497* | *498* | *499* | *500* |
| X | 169 | 164 | 181 | 165 | 171 | 169 | 168 |
| Y | 66 | 68 | 69 | 68 | 65 | 61 | 65 |