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Features of Automation of the Lesson Schedule Through the Programming Language in Higher Military Educational Institutions.

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Abstract. Information technology has become not only an integral part of people's daily lives, but also the activities of government and business institutions. In addition, the active and rational use of information technology allows the organization to maintain a high level of competitiveness, regardless of the size, scope and scope of activities. Thus, in the context of rapid and continuous development of information technologies for such organizations, it is necessary to improve the existing material resources and software used individually and as a whole information architecture. In the process of compiling the table, scientific research begins in the middle of the last century. Scheduling is available not only in the field of education, but also in the field of transport, industry, public services and more.
Keywords: Information technology, planning, automation, lesson plans, physiological, mathematical, military, optimal, Microsoft Excel, code.

Introduction
Their predecessors came mainly from the use of Microsoft Excel systems in drawing up a timetable in all educational institutions. But now I think that it is necessary for us to create a program that will save our work, that is, to make a lesson schedule automatic, so that we can use each time efficiently. According to him, at present, in the age when information technology has developed, through so many programming languages, people have greatly eased their business activities [1].
Planning - One of the most common tasks in planning and optimizing the educational process in educational institutions. The effectiveness of teachers' work depends on the mastery of teaching materials by students, how well the schedule is structured, and the rational use of material resources.
Automation planning is a classic task in the management system of educational institutions, but so far there is no single, generally accepted way to solve it. All planning approaches are based on heuristic methods that come to a person with work experience. The formalization of these methods is problematic because they involve decision-making by a planning operator who is guided by experience and intuition. Often, the employee who created the schedule cannot answer the question of why he or she chose a particular option to accommodate the classes, and not from other acceptable options. However, despite the complexity of designing algorithms, it is possible to distinguish the features of such heuristic approaches based on planning requirements. Of course,
Automating the planning of the educational process in educational institutions is one of the most common tasks. The effectiveness of teachers 'work, the mastery of teaching material by students, and the judicious use of material resources depend on how well the schedule is structured. Planning automation is a classic task in the management system of educational institutions, but at present there is no single, generally accepted way to solve it. All approaches to planning are based on heuristic methods that come to a person with work experience. The formalization of these methods is problematic because they involve decision-making made by the planning operator with experience and intuition. Often, the table compiler cannot answer the question of why he or she chose a particular option to place the groups, but not among the other acceptable ones. However, despite the complexity of designing algorithms, it is possible to highlight the features of such heuristic approaches based on planning requirements. The work on drawing up the schedule of training sessions, its submission for coordination and approval is carried out in the terms established by the schedule of regulated works on the organization of educational process [2].

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Main part

Automation of the planning of the educational process in educational institutions is one of the most common tasks. The effectiveness of the work of teachers, the assimilation of instructional material by students and the rational use of material resources depends on how correctly the table is structured. Planning automation is a classic task in the management system of educational institutions, but at the present time there is no single, generally accepted way to solve it. All approaches to planning are based on evristic methods that come to a person with work experience. Formalization of these methods is problematic because they involve decision-making that is controlled by the planning operator with experience and intuition. Often, an employee who compiles a schedule cannot answer the question of why he chose a particular option for group placement, but among other acceptable ones. However, despite the complexity of the formalization of algorithms, based on the requirements of planning, it is possible to emphasize the features of such evristic approaches. Work on the preparation of the schedule of training sessions, its submission for Agreement and approval is carried out within the time limits established by the schedule of work regulated by the organization of the educational process [3].

Currently, people are mostly using the following programming languages:

HTML, CSS, C#, PhP, Swift, Python, Java, JavaScript.

We o listed above While the number of users of these programming languages now exceeds 20 million, the most important of these are Java, Python, PhP programming languages because of the strong demand for artificial intelligence from these programming languages. Artificial intelligence allows computers to learn from their own experiences, adapt to given parameters, and perform tasks previously only possible for humans. In many cases of implementing artificial intelligence - from computer chess players to unmanned vehicles - the ability to learn deeply and process natural languages is crucial. Thanks to these technologies, computers can be trained to perform certain tasks by processing large amounts of data and identifying patterns in them [5]. When designing an automatic planning algorithm, some of these assumptions can be considered as the criteria by which they should be optimized, while others as constraints. You can also consider the issue of multi-criterion automation when planning criteria, by using our different convolutions or by using a programming language printer to bring the problem down to the problem of single-criterion automation, and then you can achieve multi-criterion compromise. To implement such an algorithm, automation methods are required. The variety and number of solutions to automation problems are numerous. The most common algorithms for such problems are class greedy algorithms. Their feature, which applies to the planning task, is that on the basis of the current values of the criteria, a decision is made in each of the functions to be written [8]. Mathematical local search algorithms can be combined with global search algorithms, but this algorithm significantly increases the number of options that need to be considered when placing lessons. Methodological and organizational requirements should be taken into account when designing tables, most of which are based on human physiological capabilities. It is advisable to plan fewer lectures and more practical sessions at the end of the semester, as close contacts between students and the teacher activate the learning process and to some extent compensate for the weakened activity of students [4]. From the point of view of creating an automated system for creating an optimal curriculum, it is advisable to set constraints using the same vector of optimization parameters; otherwise all constraints on the task must be reshaped. Most of the constraints on the optimal learning task can be formulated using some algebraic expression that consists of tables of algebraic operations and logical operations on predicates.

Teachers must get acquainted with the approved schedule, in case of long-term illness, business trip; extraordinary leave of the teacher to change the schedule of the semester part of some subjects is allowed by the decision of the director of the secondary school. The change in the schedule is recorded by the methodologist (document specialist) of the secondary school and is maintained. [6]

Our goal is to automate lesson schedules in higher military education institutions in the future. By automating the lesson schedule, we get the following conveniences.

- We will make our weekly and daily work much easier;
- Ease of calculating the total annual, semester, monthly workload of the department, faculty;
- Availability of the ability of professors and teachers to fulfill requirements according to their wishes;
- Ease of putting in half-rate and 0.25 work experience teachers on the day and hour of the week;
- Distribution of 4 and 6 hours of practical and laboratory classes on the same day;
- Automatically calculate the hours specified in the training plan;
- Indicate the name of each topic (lecture, discussion, practice, and laboratory);

Automation of the lesson schedule requires a lot of work. Because now not all people can write code through the programming profession. We perform this automation process only by writing code through the Python programming language. The codes presented below can give our eyes on the algorithms used to automate the lesson Schedule [7].

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```
from openpyxl import load_workbook, workbook
from main import struktura_list, fan_soni, mavzu_boshi, mavzu_oxir, fan_nomi,
select_list, oy_oxir, a, ustun, raspisaniya

dars_3para = ['3 paralik darslar']
e = 0
for i in range(1, fan_soni+1):
    dars_3para.append(int(ws[f'F{i+9}'].value))
    e += dars_3para[i]

dars_3para_k = ['3 paralik darslar kuni']
for i in range(1, fan_soni+1):
    dars_3para_k.append(str(ws[f'G{i+9}'].value))

imtihon = ['imtihon']
w = 0
for i in range(1, fan_soni+1):
    imtihon.append(int(ws[f'H{i+9}'].value))
    w += imtihon[i]

um_soat /= 2
k = (um_soat - e*3)/(oy_oxir - len(a[7]) - w - e)
if(k != int(k)):
    k = int(k)+1
print("har kungi paralar soni:", k)

mavzu_boshi = ['mavzu nomer boshi']
mavzu_oxir = ['mavzu nomer oxir']
for i in range(1, fan_soni+1):
    mavzu_boshi.append(int(ws[f'I{i+9}'].value))
    mavzu_oxir.append(int(ws[f'J{i+9}'].value))

def select_mavzu(fan):
    if fan == "Mustaqil tayyor.":
        return 0
    elif fan != "":
        if fan_nomi.count(fan):
            return fan_nomi.index(fan)
    else:
        return 0

wb = load_workbook('test.xlsx')
ws = wb[select_list]
f = 4
y = 0
for i in range(1, oy_oxir+1):
    if len(a[7]) == 5:
        if i != a[7][0] and i != a[7][1] and i != a[7][2] and i != a[7][3] and i
!= a[7][4]:
            y = 1
    elif len(a[7]) == 4:
        if i != a[7][0] and i != a[7][1] and i != a[7][2] and i != a[7][3]:
            y = 1
    if y == 1:
        f += 8
        for j in range(1, 5):
            ws[f'{ustun}{f + (2*j-2)}'] =
mavzu_nomer[select_mavzu(raspisaniya[i][f"{j}-p"])][0]
            if select_mavzu(raspisaniya[i][f"{j}-p"]) != 0:
                mavzu_nomer[select_mavzu(raspisaniya[i][f"{j}-p"])].pop(0)
            if raspisaniya[i][f"{j}-p"] == "Mustaqil tayyor.":
                ws[f'{ustun}{f + (2 * j - 2)}'] = "Mustaqil tayyor."
        y = 0
wb.save('test.xlsx')
```

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The above codes are written in the Python programming language. These Python codes are written in PyCharm. In the program PyCharm most of all we need to download the libraries in it so that we can write the codes. The convenience of these libraries is that it comes at the moment when we write the code and import it into an Excel file. If we look at these codes, we can see the number of subjects, how much time is allocated, the structure set, the column, and other columns, select_list these codes give us a 1-month calculation of the number of subjects in Excel from where they came from and drop them in an Excel file has the ability to give. That is, if any science at the end of the month ends with 3/1 exposure to Information Technology Science for example, it is considered capable of taking it on 3/2 discussion session from the beginning of the next month. We have already done work on the above, mainly on the mathematical algorithm; this code is a certain part of the automation of the lesson schedule. Here we have used the codes in drawing up a lesson schedule using a logical algorithm. for i in range (1, subject_number+1): here the for unction basically calculates the numbers, it calculates the end of the fan at the end of each month, and from the beginning of the next month, it distributes the same set of fan from the continuation in the sequence to the table and serves to place it right into the Excel file that we store.

topic_number [select_ topic(schedule [i][f"{j}-p"])][0: and here topic_number function selects topics from our data structure Excel file from the source and uses it in the PyCharm program using the select function depending on how many days a month the subjects are read, for example: 12 hours per month in physics if read 24 days a month if so, perform the function of dropping out once every 4 days. wb.save('test.xlsx') is to import the total codes written in PyCharm into an Excel file and save the name of the file to be saved during storage i('test.xlsx') is form [9].

Conclusion:

One of the most important issues in the quality organization of the educational process at the university is the task of creating a quality schedule of classes. This task serves to increase the effectiveness of the methodological department, as well as to further increase the knowledge of the requirements and cadets. A quality schedule should ensure that student groups and faculty are evenly loaded on a monthly, annual, and semester basis. This article focuses on designing an information system that allows you to automate a quality course schedule and create it in a relatively short period of time.

In order to automate the creation of the optimal table, an algorithm has been developed methods, as well as the development of a database storage system – allowing the database to be stored in the table. In the article written above, part of the automation has been considered, and after the completion of this process we have launched the program, I propose that all higher military educational institutions use this automated timetable in the future.

List of used literature

1. Afanasyev M. Yu. Applied tasks of operations research: Textbook / M. Yu. Afanasyev, K. A. Bagrinovsky, V. M. Matyushok. - M.: INFRA-M, 2014. - 352p.
2. Bogatyrev M. Yu. Genetic algorithms: principles of operation, modeling, and application: Monograph / M. Yu. Bogatyrev. - Tula: Tula State University, 2013. - 152 p.
3. Gimadi E. H., Polynomial solvability of calendar planning problems with stored resources and directive deadlines // Discrete analysis and operations research. Series 2. — 2015. — Vol. 7. N 1. — pp. 9-34.
4. GOST 34.003–1990 "Information technology. A set of standards for automated systems. Automated systems. Terms and definitions".
5. GOST 34.602–89 "Technical specification for the creation of an automated system (AS)".
6. GOST RV 51987 “Information technology. Set of standards for automated systems. Typical requirements and indicators of the quality of information systems functioning. General Provisions". 13. GOST R 51954 (profile of the applied environment for organization of computations on supercomputers).
7. Kazakovtseva E. A.,. Crediting and reliability analysis of schedules in the task of calendar planning of projects // Automation and telemechanics. — 2014. — T. 7. — p. 87-98.
8. Kononov A.V. On an open-type workshop task on two machines with routing in a two-vertex network // Discrete analysis and operations research. — 2017. — T 19, N 2. — p. 54-74.
9. Sheludko, V. M. High-level programming language Python. Functions, data structures, additional modules: textbook / V. M. Sheludko. – Rostov-on-Don, Taganrog: Southern Federal University Press, 2017. – 107 p. – ISBN 978-5-9275-2648-2. – Text: electronic // Electronic Library system IPR BOOKS: [website]. – URL: http://www.iprbookshop.ru/87530.html (accessed: 13.02.2020). – Access mode: for user authorization

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